

Vanderbilt University Undergraduate Catalog



VANDERBILT

Archived 2019/2020
Undergraduate School Catalog

Calendar 2019/2020

FALL SEMESTER 2019

Classes begin / Wednesday 21 August
Registration ends / Wednesday 28 August, 11:59 p.m.
Deadline to pay fall charges / Saturday 31 August
Family Weekend / Friday 20 September–Sunday 22 September
Homecoming and related activities / Sunday 13 October–Saturday 19 October
Fall break / Thursday 24 October–Friday 25 October
Thanksgiving holidays / Saturday 23 November–Sunday 1 December
Classes end / Thursday 5 December
Reading days and examinations / Friday 6 December–Saturday 14 December
Fall semester ends / Saturday 14 December

SPRING SEMESTER 2020

Deadline to pay spring charges / Thursday 2 January
Classes begin / Monday 6 January
Registration ends / Monday 13 January, 11:59 p.m.
Spring holidays / Saturday 29 February–Sunday 8 March
Classes end / Monday 20 April
Reading days and examinations / Tuesday 21 April–Thursday 30 April
Commencement / Friday 8 May

MAYMESTER 2020

Classes begin / Monday 4 May
Classes end; examinations / Friday 29 May

SUMMER SESSION 2020

Classes begin / Tuesday 2 June
Examinations for first-half courses / Friday 3 July
Second-half courses begin / Tuesday 7 July
Examinations for second-half and full-term summer courses / Friday 7 August

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Undergraduate Catalog

College of Arts and Science
Blair School of Music
School of Engineering
Peabody College



Vanderbilt
University
2019/2020

Containing general information
and courses of study
for the 2019/2020 session
corrected to 15 June 2019
Nashville

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The university reserves the right, through its established procedures, to modify the requirements for admission and graduation and to change other rules, regulations, and provisions, including those stated in this catalog and other publications, and to refuse admission to any student, or to require the withdrawal of a student if it is determined to be in the interest of the student or the university. All students, full- or part-time, who are enrolled in Vanderbilt courses are subject to the same policies. Policies concerning noncurricular matters and concerning withdrawal for medical or emotional reasons can be found in the *Student Handbook*, which is on the Vanderbilt website at vanderbilt.edu/student_handbook.

NONDISCRIMINATION STATEMENT

In compliance with federal law, including the provisions of Title VI and Title VII of the Civil Rights Act of 1964, Title IX of the Education Amendment of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990, the ADA Amendments Act of 2008, Executive Order 11246, the Vietnam Era Veterans Readjustment Assistance Act of 1974 as amended by the Jobs for Veterans Act, and the Uniformed Services Employment and Reemployment Rights Act, as amended, and the Genetic Information Nondiscrimination Act of 2008, Vanderbilt University does not discriminate against individuals on the basis of their race, sex, sexual orientation, gender identity, religion, color, national or ethnic origin, age, disability, military service, covered veterans status, or genetic information in its administration of educational policies, programs, or activities; admissions policies; scholarship and loan programs; athletic or other university-administered programs; or employment. In addition, the university does not discriminate against individuals on the basis of their gender expression. Requests for information, inquiries, or complaints should be directed to these offices: **Faculty and staff—Equal Employment Opportunity Office**, Anita J. Jenious, director, eeoinfo@vanderbilt.edu, telephone (615) 343-9336; **Students—Title IX and Student Discrimination**, Molly Zlock, Title IX coordinator and director, titleixandstudentdiscrimination@vanderbilt.edu, telephone (615) 343-9004, 110 21st Avenue South, Suite 975, Nashville TN 37203; **Students—Student Access Services**, Jamie Bojarski, director, disabilityservices@vanderbilt.edu, telephone (615) 343-9727.

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The University

COMMODORE Cornelius Vanderbilt, who gave a million dollars to build and endow Vanderbilt University in 1873, expressed the wish that it “contribute . . . to strengthening the ties which should exist between all geographical sections of our common country.”

A little more than a hundred years later, the Vanderbilt Board of Trust adopted the following mission statement: “We reaffirm our belief in the unique and special contributions that Vanderbilt can make toward meeting the nation’s requirements for scholarly teaching, training, investigation, and service, and we reaffirm our conviction that to fulfill its inherited responsibilities, Vanderbilt must relentlessly pursue a lasting future and seek highest quality in its educational undertakings.”

Today as Vanderbilt pursues its mission, the university more than fulfills the Commodore’s hope. It is one of a few independent universities with both a quality undergraduate program and a full range of graduate and professional programs. It has a strong faculty of more than 4,200 full-time members and a diverse student body of more than 12,500. Students from many regions, backgrounds, and disciplines come together for multidisciplinary study and research.

The 334-acre campus is about one and one-half miles from the downtown business district of the city of Nashville, combining the advantages of an urban location with a peaceful, park-like setting of broad lawns, shaded paths, and quiet plazas.

Off-campus facilities include Vanderbilt Dyer Observatory, situated on a 1,131-foot hill six miles south.

The schools of the university offer the following degrees:

College of Arts and Science. Bachelor of Arts.

Blair School of Music. Bachelor of Music, Bachelor of Musical Arts.

Divinity School. Master of Divinity, Master of Theological Studies, Master of Theology.

School of Engineering. Bachelor of Engineering, Bachelor of Science, Master of Engineering.

Graduate School. Master of Arts, Master of Fine Arts, Master of Liberal Arts and Science, Master of Science, Doctor of Philosophy.

Law School. Master of Laws, Doctor of Jurisprudence.

School of Medicine. Master of Education of the Deaf, Master of Genetic Counseling, Master of Public Health, Master of Science in Clinical Investigation, Master of Laboratory Investigation, Master of Science in Medical Physics, Master of Science (Applied Clinical Informatics, Speech-Language Pathology), Doctor of Audiology, Doctor of Medical Physics, Doctor of Medicine.

School of Nursing. Master of Science in Nursing, Doctor of Nursing Practice.

Owen Graduate School of Management. Master of Accountancy, Master of Business Administration, Master of Management in Health Care, Master of Marketing, Master of Science in Finance.

Peabody College. Bachelor of Science, Master of Education, Master of Public Policy, Doctor of Education.

No honorary degrees are conferred.

Mission, Goals, and Values

Vanderbilt University is a center for scholarly research, informed and creative teaching, and service to the community and society at large. Vanderbilt will uphold the highest standards and be a leader in the

- quest for new knowledge through scholarship,
- dissemination of knowledge through teaching and outreach,
- creative experimentation of ideas and concepts.

In pursuit of these goals, Vanderbilt values most highly

- intellectual freedom that supports open inquiry,
- equality, compassion, and excellence in all endeavors.

Accreditation

Vanderbilt University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award bachelor’s, master’s, professional, and doctoral degrees. Contact the Southern Association of Colleges and Schools Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call (404) 679-4500, or visit sacscoc.org for questions about the accreditation of Vanderbilt University.

Equity, Diversity, and Inclusion

Excellence at Vanderbilt is inextricably tied to the university’s commitment to fostering an inclusive community where people of all identities, backgrounds, and perspectives can thrive. The Vice Provost for Strategic Initiatives and the Vice Chancellor for Equity, Diversity and Inclusion and Chief Diversity Officer work in partnership with students, faculty, and staff to identify and implement best practices that advance equity, diversity, and inclusion across campus in pursuit of building and supporting an inclusive community enriched by a broad variety of experiences and knowledge. Visit vanderbilt.edu/diversity for more information.

The Jean and Alexander Heard Libraries

The Jean and Alexander Heard Libraries system at Vanderbilt University houses nearly five million items and provides access to millions more resources through its nine campus libraries: Central Library (A&S); Peabody Library; Annette and Irwin Eskind Family Biomedical Library and Learning Center; Walker Management Library; Wilson Music Library; Massey Law Library; Stevenson Science and Engineering Library; the Divinity Library; and the Special Collections Library. These libraries share an online presence that provides access to an integrated catalog of print and e-resources, as well as information about library services, workshops, programs, exhibitions, research guides, and librarian subject specialists.

Library staff teach students to be information literate and help them develop research skills in an increasingly complex information environment. Students can connect with a librarian in person or ask questions through the library website.

Library spaces across campus offer quiet individual study spaces, group study, and instructional rooms, as well as learning commons and cafes. Faculty- and student-curated exhibitions throughout the libraries offer intellectual and creative insights that encourage students to think critically and see their own work in new ways. Students, faculty, and staff come to the library to read in a cozy nook, meet friends for group study, grab a quick meal, or attend an author's talk. Even if you are off campus, digital library resources are at your fingertips via your phone, laptop, or computer.

The oldest items in the library date from ca. 2500 BCE, and new publications are being added every day. Among the collection strengths are: Latin American history, politics, and culture; the History of Medicine Collections; the W. T. Bandy Center for Baudelaire and Modern French Studies; the Southern Literature and Culture Collections; the United States Playing Card Collection; and the Vanderbilt Television News Archive, the world's most extensive archive of television news covering 1968 to present. The libraries are also involved in digital scholarship, publishing and partnering with faculty on the *Revised Common Lectionary*, one of the first published web-based resources of scriptural readings for the liturgical year, *Ecclesiastical and Secular Sources for Slave Societies*, a digital preservation program for endangered documents related to slave societies, the *Global Music Archive*, a multimedia archive for traditional and popular song, music, and dance of Africa and the Americas, and *Syriaca*, a digital project for the study of Syriac literature, culture, and history.

Get to know your libraries and your librarians early in your career at Vanderbilt. They have the information you need—and can help you transform that information into knowledge, creativity, and success.

Information Technology

Vanderbilt University Information Technology offers voice, video, data, computing, and conferencing services to Vanderbilt students, faculty, and staff, and provides free antivirus downloads and malware prevention in the residence halls and in many campus areas.

VUIT maintains and supports VUNet, the campuswide data network that provides access to the internet, and AccessVU, the authentication service that enables Vanderbilt users to securely identify themselves to many services on VUNet. Those services include YES (Your Enrollment Services), Brightspace, and VU Gmail, the university's email system of choice for Vanderbilt undergraduates.

It is important to note that many wireless consumer electronic devices interfere with VUNet, and in worst-case circumstances, could even cause degradation to network service. These devices are prohibited and include, but are not limited to, routers, access points (APs), or AirPorts manufactured by companies such as Apple, Belkin, D-Link, and Linksys. Additionally, settings for smartphone hotspots and wireless connectivity for printers and other devices must be disabled to prevent interference with university wireless APs.

VUIT partners with Sprint, Verizon, and AT&T to offer discounts for cellular phone service. For discount information see it.vanderbilt.edu/cellphone.

Vanderbilt offers all students low-cost and free-of-charge software, including Microsoft Office and Microsoft Windows. See softwarestore.vanderbilt.edu for a complete product catalog and more information.

For campus residents, VUIT supports ResNet, which provides a direct connection to VUNet and the internet. Cable television ports are provided in each campus residence.

VUIT offers various conferencing and collaboration services for students. In addition to Gmail at Vanderbilt, undergraduates can enjoy Google drive and Google hangouts (among other Google services) at gmail.vanderbilt.edu. Audio and video conferencing are also available. See it.vanderbilt.edu/services/collaboration for more information.

The Tech Hub provides information to students, faculty, and staff about VUNet and VUNet services. Tech Hub locations, hours, contacts, and other information can be found at it.vanderbilt.edu/techhub.

For more information on IT services and computing at Vanderbilt, go to it.vanderbilt.edu.

Commencement

The university holds its annual Commencement ceremony following the spring semester. Degree candidates must have completed successfully all curriculum requirements and have passed all prescribed examinations by the published deadlines to be allowed to participate in the ceremony. A student completing degree requirements in the summer or fall semester will be invited to participate in Commencement the following May; however, the semester in which the degree was actually earned will be the one recorded on the diploma and the student's permanent record. Financially clear students unable to participate in the graduation ceremony will receive their diplomas by mail. Please refer to the Commencement webpage at vanderbilt.edu/commencement for complete information on the May ceremony.

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Special Programs for Undergraduates

Immersion Vanderbilt

Immersion Vanderbilt calls for each undergraduate student to participate in an intensive learning experience that takes place in and beyond the classroom and culminates in the creation of a tangible final project. This requirement applies to all undergraduates who enter Vanderbilt as first-year students in or after summer 2018, as second-year students in or after summer 2019, or as third-year students in or after summer 2020.

Immersion Vanderbilt will be divided into four broad pathways: civic and professional, creative expression, international, and research. The pathway selected by the student may focus on one or more than one of these areas and should provide a structure upon which students can brainstorm, plan, and execute their immersive projects across multiple years. Civic and professional plans may take a deep dive into the for-profit or nonprofit worlds through internships or service work. Students whose plans include creative expression can develop a performance piece, exhibit, or artistic work. International program plans often explore culture, language, and history through a global lens. Finally, a research pathway plan may engage the student in discovery through research in the humanities, engineering, or the social, physical, or life sciences. A student's Immersion plan and project do not have to be within their home school. In fact, students are encouraged to look for new pathways in other schools as they think about and develop their immersive experiences.

Immersion Vanderbilt is composed of three phases over the four-year experience. Phase one involves the creation of a plan that identifies the project, pathway to completion, and contribution to a student's overall education. Phase two is the experiential phase, when the student engages in a civic and professional, creative expression, international, or research pathway, developing skills and knowledge. The workload for the experiential phase should be equivalent to 9 credit hours of work and may be fulfilled with a combination of Vanderbilt course credits and/or approved Immersion activities.

Finally, Immersion Vanderbilt culminates in the creation of a final project which arises from the experience. Examples of final projects include research presentations, art shows, performances, design projects, and theses. Each student's final project will be approved and assessed as required by the supervising school or college. The Office of Immersion Resources coordinates a series of showcases open to the entire campus where students display their projects. Upon the completion of phase three, OIR conveys that the requirements have been met. Completion of the Immersion Vanderbilt graduation requirement will be shown on the student's degree audit and the Immersion project will be added to the student's transcript. vanderbilt.edu/immersion

Study Abroad

Vanderbilt offers study abroad opportunities for all undergraduate students from the College of Arts and Science, Blair School of Music, School of Engineering, and Peabody College. Programs are available for the semester, full academic year, summer, and Maymester. Students may study abroad any time after their freshman year at Vanderbilt. Through study abroad programs led by Vanderbilt faculty and through additional programs

provided by agreements with other universities and providers, Vanderbilt students can take courses in Argentina, Australia, Austria, Brazil, Canada, Chile, China, Cuba, the Czech Republic, Denmark, the Dominican Republic, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Jordan, Kenya, Morocco, Nepal, the Netherlands, New Zealand, Russia, Samoa, Senegal, Serbia, Singapore, South Africa, Spain, Sweden, Switzerland, Uganda, the United Kingdom, and Vietnam.

Study abroad programs are open to students in good academic, financial, and disciplinary standing, with an overall grade point average of 2.700 or better, or a grade point average at this level in each of the two most recent semesters. Many programs require a higher grade point average and, where applicable, the student's application must also be approved by the appropriate host university, institute, or consortium. Study abroad programs that are managed by Vanderbilt, such as Maymester courses, offer direct Vanderbilt credit. Approved programs offered by Vanderbilt's exchange, consortium, or provider partners are articulated as Vanderbilt Study Abroad/Away Credit. Grades awarded are reflective of the local grading practices of the host institution. Students are encouraged to discuss the grading bases and practices of their specific program with their study abroad adviser prior to departure. Hours earned through these programs and approved in advance by the appropriate department serve to satisfy the residence requirement (refer to the relevant Academic Regulations chapter for the home school). Students are not eligible to earn Dean's List honors for the semester in which they study abroad.

Students studying on Vanderbilt programs or Vanderbilt-approved programs for the academic year or semester are eligible for federal and VU financial aid. This includes merit scholarships but excludes work-study. All participants in approved Study Abroad programs are billed through Vanderbilt Student Accounts and must pay Vanderbilt tuition, an administrative fee, and a program fee, which includes housing and international health insurance.

It should be noted, however, that if a program has been approved by Vanderbilt, students must enroll in the program via the Global Education Office. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt. Information is available from the Global Education Office (GEO), Suite 103, Student Life Center, and at vanderbilt.edu/geo.

Vanderbilt-Approved Programs

Through arrangements with the Consortium for Advanced Studies Abroad (CASA), Council on International Educational Exchange (CIEE), CET Academic Programs (CET), Study Abroad in Scandinavia (DIS), Institute for the International Education of Students (IES), the Institute for Study Abroad (IFSA), Frontiers Abroad, Boston University (BU), Georgia Tech (GA-Tech), and the School for International Training (SIT), Vanderbilt students may select from a wide range of study abroad opportunities. Vanderbilt-approved study abroad programs can be sorted into three general program types: Study Center programs; Direct University Enrollment programs; and Study Center and Direct University Enrollment Hybrid programs.

Study Center programs tend to serve primarily U.S. study abroad students, and often have a thematic focus or specialty, such as language immersion, research, or experiential learning. Programs falling into this category include: CET programs in Italy (Florence and Siena), China (Beijing, Shanghai, Harbin, and Kunming); and the Czech Republic (Prague); SIT programs in Chile, India, Jordan, Kenya, Morocco, Nepal, Samoa, Serbia, Switzerland, Uganda, and Vietnam; CIEE programs in St. Petersburg, Russia, Dakar, and Senegal; DIS programs in Copenhagen, Denmark, and Stockholm, Sweden; IES program in Vienna, Austria; the Georgia Tech–Lorraine engineering program in Metz, France; and the Intercollegiate Center for Classical Studies in Rome, Italy (ICCS).

Direct University Enrollment programs allow students to enroll directly in a university abroad to study alongside local students and other international students. Direct University Enrollment programs provide access to a wide variety of course work across multiple disciplines. Many of these programs are facilitated by a partner organization which coordinates housing and other services as well as facilitates integration with the host university. Programs in this category include: seven universities in Australia; three universities in New Zealand; four universities in Ireland; four universities in Scotland; three universities in England; one university in Belfast, Northern Ireland; three universities in Israel; two universities in Hong Kong (both engineering only); four universities/colleges in the Netherlands; one university in Japan; one in Palma de Mallorca, Spain; one in Granada, Spain (via CASA); one in Singapore (engineering only); one in Budapest, Hungary (engineering only); one in Turin, Italy (engineering only); one in Paris, France (social sciences and French language studies); and fourteen in Canada.

Study Center and Direct University Enrollment Hybrid programs combine the two program types. Students are based at a program center with other study abroad students and have the option, or requirement, to take courses at one or more local universities. Programs in this category include: CASA programs in Buenos Aires, Argentina; Havana, Cuba; Santiago, Chile; Rio de Janeiro, Brazil; and Seville, Spain; the BU Dresden Engineering program in Germany; three Frontiers Abroad programs in New Zealand which include a five-week pre-semester earth sciences or geology field camp; CIEE programs in Barcelona, Spain; the CIEE program in Santiago, Dominican Republic; CIEE programs in Toulouse, France; and the CET programs in Prague, Czech Republic, for film production, photography, or new media.

Joint and Dual Programs

Vanderbilt undergraduates in Blair School of Music, School of Engineering, and Peabody College take their background liberal arts and science courses in the College of Arts and Science—and may take other elective courses in these areas as individual degree programs will allow. In like manner, students in the College of Arts and Science may take courses in the other schools for regular credit toward the liberal arts degree. Students may earn a second major or minor outside of their school, as well.

Several dual programs, combining undergraduate study with work toward a master's degree, may facilitate possible saving a year in the time required to complete both degrees. Details of the various dual programs will be found in the appropriate school sections of this catalog.

Preparation for Careers in the Health Professions

Study programs leading to careers in medicine, dentistry, veterinary science, pharmacy science, and many related areas are overseen by the Health Professions Advisory Office (HPAO).

Medicine

There is no formal prehealth program of courses at Vanderbilt. Each student should plan a program to meet individual requirements. Prehealth studies should include courses that are necessary to meet professional school admission requirements and to satisfy the requirements of the student's undergraduate degree program. Students interested in prehealth studies should plan their undergraduate programs in consultation with HPAO staff and their primary academic adviser. Additional information is available at vanderbilt.edu/hpao.

Students are encouraged to consult the directory *Medical School Admission Requirements: United States and Canada*, published online by the Association of American Medical Colleges, as a guide to planning their undergraduate programs. A link to the guide can be found on the HPAO website.

See the *Vanderbilt University School of Medicine Catalog* for the official statement on minimum requirements for admission to Vanderbilt University School of Medicine.

Nursing

Pre-nursing students enrolled in the College of Arts and Science or Peabody College are strongly encouraged to apply for admission to the School of Nursing's M.S.N. program by November 1 of their senior year at Vanderbilt.

Admission to the Graduate Nursing Program. Students are subject to all nursing school admission requirements, and no student is assured of admission to the School of Nursing. Prior to admission to the School of Nursing, applicants must have completed prerequisite courses, including the following:

A required introductory course in statistics that includes descriptive and inferential statistical techniques; Mathematics 1010–1011, Mathematics 2820, or Peabody Psychology 2110 will fulfill this requirement.

11 hours of natural science courses. Courses in human anatomy and physiology (MHS 3101 and 3102) and microbiology (MHS 1500) are required. Human and Organizational Development 1250 (Applied Human Development) or Peabody Psychology 1250 (Developmental Psychology) will fulfill the requirement.

2 hours of nutrition are required. MHS 1600, Introduction to Nutritional Health, fulfills the requirement for nutrition.

Admission to the School of Nursing is competitive. Consult the School of Nursing catalog for specific requirements and admission procedures. Students are encouraged to write or call the School of Nursing's Office of Admissions, Room 170, 461 21st Avenue South, Nashville, Tennessee 37240, (615) 322-3800, or visit the website, nursing.vanderbilt.edu, for further explanation of pre-nursing and graduate nursing programs.

Preparation for Other Professional Careers

Architecture, Law, and Journalism

Undergraduate students expecting to pursue architecture, law, or journalism at the graduate level may earn any major at Vanderbilt, but should be aware of graduate field requirements. See the chapter on Special Programs in the College of Arts and Science section of this catalog.

Teacher Licensure Programs

Vanderbilt offers programs through Peabody College leading to licensure for teaching. Students seeking teacher licensure should refer to the Peabody College section of this catalog. Students seeking licensure in music should see the Blair School of Music section of this catalog.

Undergraduate students in the College of Arts and Science, Blair School of Music, the School of Engineering, or Peabody College who are seeking licensure in early childhood, elementary, or secondary education must complete a major outside of teacher education and a Peabody College education major. Licensure in special education fields does not require a second major.

Undergraduate Business Minor

Vanderbilt University offers a transinstitutional, interdisciplinary undergraduate minor in business that is jointly administered by the Blair School of Music, the College of Arts and Science, the Owen Graduate School of Management, Peabody College, and the School of Engineering. The undergraduate business minor requires 16.5 credit hours and is directed by Gary Kimball.

The undergraduate business minor (BUS) provides students with a rigorous exposure to the fundamental business disciplines of financial reporting, finance, organizational behavior, marketing, and operations. The undergraduate business minor also intentionally grounds the study of business within the liberal arts tradition, allowing students to understand the context within which business operates in society.

Students declaring the undergraduate business minor (BUS) may not also declare either of the minors in human and organizational development (HOD) or engineering management (ENGM). Students electing the undergraduate business minor must follow academic regulations regarding minors in their home school, including but not limited to regulations regarding unique hours.

Four of the five mandatory courses in the undergraduate business minor require one of the following prerequisites, which may be completed in any order or simultaneously; Advanced Placement (AP) or International Baccalaureate (IB) credit may be used to satisfy the Microeconomics prerequisite.

1. Introductory Microeconomics: ECON 1020
2. Introductory Statistics: One of BME 3200, ECON 1500, ECON 1510, MATH 1011, MATH 2810, MATH 2820, MATH 2821, PSY 2100, PSY-PC 2110, or SOC 2100

The Undergraduate Business Minor

The undergraduate business minor (BUS) requires 16.5 credit hours of course work, distributed as follows:

1. 7.5 credit hours of required course work composed of 5 half-semester courses listed below. While not required, it is recommended that students complete the five required courses prior to fulfilling the elective requirement. Students may not concurrently enroll in any of the five required courses.

BUS 2100	Essentials of Financial Reporting	(1.5 hours)
BUS 2300	Principles of Finance	(1.5 hours)
BUS 2400	Organizational Behavior	(1.5 hours)
BUS 2600	Principles of Marketing	(1.5 hours)
BUS 2700	Managing Operations	(1.5 hours)

2. At least 6 credit hours of courses selected from one or more of the seven "BUS pathways" (entrepreneurship, ethics, finance and accounting, marketing and advertising, operations, organizational effectiveness, and strategy).
3. At least 3 credit hours of courses selected either from the "BUS pathways" or from the "business-in-society" electives. "Business-in-society" electives represent business-related disciplines in the liberal arts tradition, and are listed following the "BUS pathway" electives below.

*BUS Pathways***Entrepreneurship**

ENGM 3600	Technology-based Entrepreneurship
MGRL 2300	Entrepreneurship: The Business Planning Process
MGRL 3300	Entrepreneurial Challenge
MGRL 3841	Directed Study: Entrepreneurial Studio
SOC 3206	Creativity and Innovation in Society

Ethics

HODC 3232	Ethics for Human Development Professionals
PHIL 1100	Introduction to Business Ethics
PHIL 3609	Ethics and Business

Finance and Accounting

ECON 2300	Money and Banking
ECON 3200	Public Finance
ECON 3300	Financial Instruments and Markets
ECON 3610	International Finance
FNEC 1605	Advanced Financial Accounting
FNEC 2600	Managerial Accounting
FNEC 2705	Advanced Corporate Finance
FNEC 3700	Investment Analysis
FNEC 3705	Financial Management
FNEC 3710	Corporate Valuation

Marketing and Advertising

ENGM 3200	Technology Marketing
MGRL 3200	Advanced Marketing

Operations

ENGM 3000	Enterprise Systems Design
ENGM 3650	Operations and Supply Chain Management
ENGM 3700	Project Management
MGRL 2200	Data Analysis and Presentation

Organizational Effectiveness

CMST 2120	Organizational and Managerial Communication
HODI 3240	Effectiveness in International For-Profit Organizations
HODL 3204	Leadership Theory and Practice
HODL 3224	Analyzing Organizational Effectiveness
HODL 3234	Advanced Organizational Theory
HODL 3244	Introduction to Human Resource Development
HODL 3254	Human Resource Management
HODL 3264	Evidence-based Practice in Organizations
HODL 3274	Managing Organizational Change
HODL 3314	Strategic Planning and Project Management
PSY 3605	Industrial and Organizational Psychology
SOC 3615	Human Behavior in Organizations

Strategy

ECON 2160	Strategic Analysis
ECON 3250	Industrial Organization
ECON 4260	Game Theory with Economic Applications
MGRL 2200	Data Analysis and Presentation
MGRL 3105	Negotiation
MGRL 3110	Business Management
MGRL 3255	Advanced Corporate Strategy

Business-in-Society Electives

ANTH 3135	Development, Social Enterprise, Social Injustice
ANTH 4153	Economic Anthropology
CHIN 4401	Business Chinese I
CHIN 4402	Business Chinese II
ECON 2100	Labor Economics
ECON 2150	U.S. Economic History
ECON 2220	Latin American Development
ECON 3100	Wages, Employment, and Labor Markets
ECON 3160	Economic History of Europe
ENGL 3898	Special Topics in English and American Literature (Business Leader's Bookshelf)

FREN 3111	French for Business
GER 4558	Business German
HIST 1600	European Economic History, 1000-1700
HIST 1640	History of American Capitalism
HIST 1660	American Enterprise
HIST 2138	Blood Diamonds, Blood Oil, Commodities, and Conflicts in Africa
HIST 3190	Religion, Culture, and Commerce: The World Economy in Historical Perspective
HIST 3200	Poverty, Economy, and Society in Sub-Saharan Africa
HODL 3890	Special Topics: Introduction to Data Science: Using Data for Understanding
MENT 1120	The Business of Music
MENT 1130	Building Communities through Music and the Arts [1 credit hour]
MENT 1135	Arts Administration: Best Practices and Careers in the Arts Organization [1 credit hour]
MENT 1140	Creating Funding and Nonprofit Vehicles for 21st-Century Community Service [2 credit hours]
PSY-PC 2120	Statistical Analysis (second course in sequence)
PSY-PC 3735	Correlation and Regression
PSY-PC 3749	Applied Nonparametric Statistics
SOC 1020	Contemporary Social Issues: Corporations and Society (only this emphasis)
SOC 3316	Business, Civil Society, and the Environment
SOC 3318	Sociology of Green Jobs
SPAN 3345	Spanish for Business and Economics

Course Descriptions

BUS 2100. Essentials of Financial Reporting. Emphasis on mandated corporate disclosure. Economic concepts that guide the development and use of accounting conventions as well as the institutional context that disciplines producers and users. Students who have taken FNEC 1600 will not receive credit for BUS 2100. Prerequisite: ECON 1020. [1.5]

BUS 2300. Principles of Finance. Emphasis on asset valuation, stock and bond valuation, capital budgeting, cost of capital, market efficiency, and company valuation. Students who have taken FNEC 2700 will not receive credit for BUS 2300. Prerequisite: BUS 2100, ECON 1020, and one of BME 3200, ECON 1500, ECON 1510, MATH 1011, MATH 2810, MATH 2820, MATH 2821, PSY 2100, PSY-PC 2110, or SOC 2100. [1.5]

BUS 2400. Organizational Behavior. Accomplishing goals by effectively working for, with, and through others. The units of analysis explored are individuals, teams, and organizations. Students who have taken HOD 2100 will not earn credit for BUS 2400. Course not open to HOD and HOS majors. [1.5]

BUS 2600. Principles of Marketing. Success in business is driven by providing goods and services that consumers need and want. This course covers how to achieve such success through analyses of companies, customers, and competitors, and making the right decisions regarding what products to offer, and how to price, promote, and distribute them. Course content spans a wide variety of settings including consumer goods, hi-tech, and service firms, and puts a particular emphasis on digital marketing opportunities and the evolving role of social media. Students who have taken MGRL 1200 will not receive credit for BUS 2600. Prerequisite: one of BME 3200, ECON 1500, ECON 1510, MATH 1011, MATH 2810, MATH 2820, MATH 2821, PSY 2100, PSY-PC 2110, or SOC 2100. [1.5]

BUS 2700. Managing Operations. Provides an overview of operations in both service and manufacturing organizations. Process analysis, queuing, inventory management, quality management, lean operations, and optimization. Prerequisite: ECON 1020 and one of BME 3200, ECON 1500, ECON 1510, MATH 1011, MATH 2810, MATH 2820, MATH 2821, PSY 2100, PSY-PC 2110, or SOC 2100. [1.5]

University Courses

By tackling pressing real-world problems and addressing big questions, University Courses educate the whole student and promote lifelong learning. The courses leverage the natural synergies across Vanderbilt's ten schools and colleges, giving students the opportunity to reach beyond their area of study and interact with faculty at the intersection of disciplines. Each course promotes transinstitutional learning while providing opportunities to embrace diverse perspectives. For more information, visit vu.edu/university-courses.

Officer Education Programs

Air Force Reserve Officer Training Corps (AFROTC)

The Air Force Reserve Officer Training Corps (AFROTC) provides pre-commission training for college men and women who desire to serve as commissioned officers in the United States Air Force. When combined with the academic disciplines offered at the college level, the program provides the student a broad-based knowledge of management, leadership, and technical skills required for a commission and subsequent active-duty service in the Air Force.

Graduates are commissioned as Second Lieutenants and will enter active duty. The main objectives of producing officers through the AFROTC program are (1) to procure officers with a broad educational base, (2) to provide a basic military education for college students, (3) to teach fundamentals and techniques of leadership, management, and decision making, and (4) to develop, in conjunction with other academic disciplines, individual character and attributes required of a commissioned officer in the United States Air Force.

AFROTC Program/Scholarships

Enrolling in AFROTC. Please go to www.tnstate.edu/afrotc for application deadlines. Vanderbilt University students may participate in the Air Force ROTC program in cooperation with Tennessee State University. Call Detachment 790, (615) 963-5980, and ask for a Cross-Town Application. Mail this application and your official transcripts with your immunization records back to Detachment 790. The program provides training and education that will develop skills and attitudes vital to the professional Air Force officer.

Students who participate in the Air Force ROTC program must be enrolled at Vanderbilt University. The student is also jointly enrolled as a TSU student and participates in Aerospace Studies (Air Force ROTC) at TSU. For more information, contact the unit admissions officer at (615) 963-5931/5979 or check our website at www.tnstate.edu/afrotc.

Currently there is no charge for tuition to take Air Force ROTC. The grade and credit can transfer back for graduation as indicated below.

Curriculum. The General Military Course (GMC) is composed of the first four semesters of aerospace studies (AERO) and is for freshmen and sophomores. The Professional Officer Course (POC) constitutes the final four semesters of AFROTC study and enrolls juniors and seniors. The Leadership Lab is required.

General Benefits

All students enrolled in the AFROTC program are provided textbooks and uniforms at no expense. Professional Officer Course (POC) students (juniors and seniors) and all scholarship students receive a monthly subsistence allowance of up to \$500 tax-free. Additionally, Vanderbilt University offers a generous stipend to all AFROTC cadets.

Sponsored Activities

Arnold Air Society is a national society of AFROTC cadets who excel in character and academics and exhibit interests in the study of aerospace technology. The group meets at TSU.

Professional Development Training is provided during the summers to cadets interested in enhancing their knowledge of Air Force leadership and management opportunities, increasing their cultural awareness, and learning about specific career specialties.

AFROTC Flight Orientation Program is designed to allow all cadets, regardless of intended career field, the chance to fly as front seat or back seat passengers in Civil Air Patrol aircraft. Everyone can experience the joy of flight.

Aerospace Studies Courses at TSU

FRESHMAN YEAR

Foundations of the United States Air Force (no credit at Vanderbilt)

SOPHOMORE YEAR

The Evolution of USAF Air and Space Power (transfers as GNEL 2000)

JUNIOR YEAR

Air Force Leadership Studies (transfers as HOD 2051)

SENIOR YEAR

National Security Studies/Preparation for Active Duty (no credit at Vanderbilt)

Army Reserve Officers' Training Corps (ROTC)

The Army Reserve Officers' Training Corps (ROTC) is a sequential and progressive academic program that provides pre-commission training for college-educated men and women who desire to serve as commissioned officers in the active Army, Army Reserve, and Army National Guard. As the Army's largest commissioning source, it fulfills a vital role in providing mature young men and women for leadership and management positions in an increasingly technological Army. Admission is open to both men and women who meet mental, moral, and physical qualifications.

Training goes beyond the typical college classroom and is designed to build individual confidence and self-discipline, instill values and ethics, and develop leadership skills. The course load consists of one course per semester. Each succeeding year will address course topics in greater depth as students receive feedback on their leadership style and assume positions of greater responsibility within the program. Graduates are commissioned as Second Lieutenants and will enter active duty with follow-on employment in the Army Reserves, National Guard, or active duty. Educational delays may be granted for graduates who desire to pursue advanced degrees prior to entry on active duty.

All university students in the Nashville area may participate in the Army ROTC program at Vanderbilt University. While Vanderbilt serves as the host university, students at partnership schools are not charged additional tuition to take military science courses. Grades are transferred back to each university and added to the students' transcripts.

Scholarships. Students can earn merit scholarships in several ways. High school seniors and graduates compete for four-year scholarships that are determined by local competition among Vanderbilt applicants. Although determined locally, the application process is centrally managed. Scholarship students receive financial benefits that cover the cost of full tuition scholarships each year, an annual \$1,200 book allowance, all uniforms, and a monthly tax-free stipend beginning at \$300 for freshmen and increasing to \$500 for seniors. Vanderbilt University also provides Vanderbilt ROTC scholarship students an additional \$6,000 tuition grant each year for room and board. Students who are not on scholarship receive the monthly stipend during their junior and senior years. All students enrolled in the Army ROTC program are provided textbooks and uniforms at no expense. Contracted non-scholarship students also receive the monthly stipend from \$300 to \$500 depending on the academic level. For more information, see the website at goarmy.com/rotc.html.

Summer training. Students have the opportunity to attend several training events over the summer.

Advanced Camp — This five-week leadership exercise at Fort Knox, Kentucky, is a commissioning requirement. This is normally done between the junior and senior years. Travel, room, and board are provided free, and cadets are paid approximately \$700.

Cultural Understanding and Language Program (CULP) Internships — Students are encouraged to spend a semester, special or summer session in academic studies abroad if feasible. Special incentives are available to further attract qualified students to these valuable programs.

Cadet Troop and Leadership Training Internships (CTLT) — CTLT Internships are leadership development opportunities for students who are placed with military organizations throughout the world to gain perspective and understanding on the role of the military officer.

Cadet Professional Field Training (CPFT) — Airborne, Air Assault, Mountain Warfare, Robin Sage (U.S. Special Forces), Helicopter Flight Training, and Sapper.

Other training opportunities exist for qualified applicants who are interested.

Commissioning and career opportunities. A commission in the U.S. Army is a distinctive honor earned through hard work, demonstrated commitment, and a desire to serve the nation. Post-graduate military education, usually starting within six months of graduation and commissioning and continuing through the officer's service career, begins with the basic officer leadership course followed by officer basic course that qualify new lieutenants in their specific branch of service. Education delays are available for critical specialties requiring postgraduate civilian education such as law and medical degrees.

Course credit. During the four-year program, Army ROTC students complete eight courses of military science plus associated labs. Academic credit varies by university.

Vanderbilt University College Credit: All AROTC courses count toward elective credit. See course descriptions below.

Information. Inquiries regarding enrollment in the Army ROTC program should be made to the Army ROTC Admissions Officer at (615) 322-8550 or (800) 288-7682 (1-800-VUROTC). Also see vanderbilt.edu/army.

Military Science Department

COMMANDING OFFICER Dustin R. Mitchell
MILITARY INSTRUCTORS Matthew Mount, Dustin R. Mitchell,
Robert B. Hulette, Johnny Simon

Military Science Courses

During the four-year program, Army ROTC students complete eight courses of military science plus associated labs, and must complete an American Military History course and Advanced Camp.

FIRST YEAR

MS-PC 1210. Leadership and Personal Development. (Formerly MS 111). Leadership is one of the most compelling topics of our time, and might be one of the most important attributes for effectiveness in all levels of human endeavor. The success of one of the most admired and respected institutions in our country, the military, is founded upon the understanding and effective application of leadership, and the development of leaders. This course introduces students to the personal challenges and competencies that are critical to effective leadership. The focus is on developing basic knowledge and comprehension of leadership attributes and core leader competencies in a universal setting and exploring potential applications of these principles and practices at Vanderbilt, in the military and in the corporate world. [1]

MS-PC 1210L. Leadership and Personal Development Lab. (Formerly MS 111a). Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations. Within the military science curriculum, this process is called the Leadership Development Program (LDP), modeled after the principles spelled out in Field Manual 22-100, *Army Leadership*, and is standardized both on campus and in Advanced Camp environments. The flexible methodology of LDP accommodates personalized, individual development at all levels of proficiency throughout the officer educational experience, from program entry to commissioning. The LDP includes basic leadership training, periodic assessment and counseling at both team and individual levels by experienced observers. Trends and deficiencies are identified and addressed with retraining and reassessment in a continuous cycle. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. Student performance in leadership roles is assessed and notable strengths and weaknesses are identified. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

MS-PC 1230. Leadership and Personal Development II. (Formerly MS 113). What motivates others to follow a person is intriguing, inspiring and alluring. Through routine observation, we learn from leaders regardless of the setting (military, business, education, etc.). Leadership and Personal Development II provides an overview of leadership fundamentals such as setting direction, problem solving, listening and providing feedback. You will explore dimensions of leadership, values, attributes, skills, and actions in a military context through practical, hands-on, and interactive exercises. [1]

MS-PC 1230L. Leadership and Personal Development II Lab. (Formerly MS 113a). Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations; this process is called the Leadership Development Program. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

SOPHOMORE YEAR

One American Military History course, chosen from the following:

HIST 1730. The U.S. and the Cold War.

HIST 1740. The U.S. and the Vietnam War.

HIST 2720. World War II.

MS-PC 1510. American Military History: Principles of War.

PSCI 3272W. The War in Iraq, 2003–2011.

MS-PC 2150. Foundations of Leadership. MS-PC 2150 introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for future commissioned Army officers. This class is broken down into five key skills development areas: 1) values and ethics, 2) personal development, 3) officership, 4) leadership, and 5) tactics and techniques. The class emphasizes individual leadership values and characteristics with a focus on Leadership Theory and Interpersonal Communications, Army Values, Troop Leading Procedures, Problem Solving, and Team Building in a military environment. [2]

MS-PC 2150L. Foundations of Leadership Lab. (Formerly MS-PC 150a). This lab builds upon the classroom topics in MS-PC 2150 and introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for future commissioned Army officers. The lab is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. The lab emphasizes individual leadership values and characteristics with a focus on leadership theory and interpersonal communications, Army values, troop leading procedures, problem solving, and team building in a military environment. [1]

MS-PC 2160. Foundations of Tactical Leadership. (Formerly MS 152). MS-PC 2160 builds upon MS-PC 2150. The class is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. During this class we will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [2]

MS-PC 2160L. Foundations of Tactical Leadership Lab. (Formerly MS 152a). MS-PC 2160L builds upon MS-PC 2150 and MS-PC 2150L. The lab is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. During the lab we will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [1]

JUNIOR YEAR

MS-PC 3110. Leadership and Problem Solving. (Formerly MS 211). This course builds upon your skills developed in MS-PC 2160 and continues to develop leadership, officership skills, self-awareness, and critical thinking skills through challenging scenarios related to small-unit tactical operations. Cadets receive systematic and specific feedback on their leadership values, attributes, skills, and actions. Prerequisite: MS-PC 1210 (111), 1230 (113), 2150 (150), and 2160 (152). [3]

MS-PC 3120. Applied Team Leadership. (Formerly MS 212). Challenging scenarios related to small-unit tactical operations are used to develop self-awareness and critical thinking skills. Students receive systematic and specific feedback on their leadership values, attributes, skills, and actions. Prerequisite: MS-PC 3110. [3]

SUMMER BETWEEN JUNIOR AND SENIOR YEAR

Cadet Leader Course (1 Cr) — All students pursuing a commission as an Army Officer must complete Advanced Camp during the summer between their junior and senior year. Students may apply for 1 credit hour of academic credit with the designation

of interdisciplinary internship (INDS 3881). This course may be taken once and repeated once for a maximum of 2 credits on a Pass/Fail basis only.

SENIOR YEAR

MS-PC 4150. Leadership and Ethics. (Formerly MS 251). Students develop proficiency in planning, executing, and assessing complex operations, functioning as a member of a staff, and providing leadership-performance feedback to subordinates. Students are given situational opportunities to assess risk, make sound ethical decisions, and provide coaching and mentoring to fellow ROTC Cadets. Prerequisite: MS-PC 3120. [3]

MS-PC 4160. Leadership in a Complex World. (Formerly MS 252). Students develop proficiency in leadership and management skills required of junior officers serving in military companies. The course further explores the dynamics of leading in complex situations of the contemporary operating environment and applies a cultural lens to problem solving. Students continue to gain leadership experience through situational opportunities, organizational projects, and coaching and mentoring fellow ROTC Cadets.

Naval Reserve Officer Training Corps (NROTC)

The Naval Reserve Officer Training Corps (NROTC) unit at Vanderbilt conducts the Naval Officer Education program.

Challenging academic courses and experience-building events prepare a select group of highly accomplished students for the opportunity to serve their country as a Navy or Marine Corps officer and receive an education. The primary focus of the NROTC program is to develop the most capable leaders possible by building upon the academic strength of Vanderbilt and providing essential military and leadership education.

Students participate in the NROTC unit in the scholarship program, the college program, or the naval science program. College Program students take the prescribed naval science course each semester, participate weekly in naval science lab, and engage in summer training programs after each academic year. The NROTC College Program is identical to the scholarship program except for tuition financial benefit and that students only participate in summer training upon completion of their junior academic year. Also, any Vanderbilt student may take any or all of the naval science courses without participating in naval science lab or summer training.

Scholarship students receive tuition, fees, uniforms, \$375 per semester for textbooks, and a monthly stipend beginning at \$250 for freshmen and increasing to \$400 for seniors. Vanderbilt may provide scholarship students with up to a \$6,000-per-year stipend toward room and board. College Program students are provided uniforms, textbooks for naval science courses, and a monthly stipend of \$350 upon commencement of their junior year with approval by higher authority based on academic performance and military aptitude.

Scholarships. Students can earn scholarships in several ways. Four-year scholarships are determined by national competition among high school seniors and graduates. Based on the national ranking, students may be awarded a scholarship that covers full tuition. To be eligible, applicants must have less than 30 semester hours of college credit. College Program students can also be nominated for three- and two-year scholarships by the NROTC unit. These nominations are based on the students' academic and military performance at the college level. Sophomores not enrolled in the College Program are eligible to apply for the two-year NROTC scholarship program. This is a national competition and application is made through the NROTC unit.

Service obligation. For most students at the beginning of their sophomore year, should they choose to continue with the NROTC program, Navy option scholarship students

incur a minimum service obligation of five years active duty, and Marine option scholarship students incur a minimum service obligation of four years of active duty, to be served upon graduation or withdrawal from the program. College Program students incur a three-year active duty commitment upon graduation or withdrawal from the program. Additional requirements may be required for specific job assignments.

Summer training. Summer training for three to four weeks is conducted aboard naval vessels and naval shore stations after each of the first three academic years. Scholarship students are normally required to participate each year. All scholarship and College Program midshipmen are required to participate in summer training prior to their final academic year.

Course credit. During the four-year program, NROTC Navy-option students are required to complete eight courses (24 hours) of naval science, and Marine-option students are required to complete six courses (18 hours) of naval science. Academic credit awarded varies by course and is outlined in the course descriptions below.

Required Courses for Navy/Marine Scholarship. The following courses are required for students on scholarship:

Calculus (Navy option only) (6 credits minimum): Mathematics 1200–1201, or 1300–1301 completed by the end of the sophomore year.

Physics (Navy option only) (6 credits): 1501–1502 or 1601–1602 completed by the end of the junior year.

English (6 credits): Two semesters of any English course or courses containing a designated writing component.

American History/National Security Policy (3 credits): Contact the Naval ROTC unit for a listing of courses fulfilling this requirement.

World Culture/Regional Studies (Navy option only) (3 credits): Contact the Naval ROTC unit for a listing of courses fulfilling this requirement.

Information. Inquiries regarding enrollment in the Naval ROTC program should be made to the Naval ROTC unit recruiting officer at (615) 322-2671, or by contacting a local Navy or Marine Corps recruiting station.

Admission to the program is open to both men and women. Physical qualification to Naval Service standards is required.

Naval Science

COMMANDING OFFICER Donald May
EXECUTIVE OFFICER Matthew Harding
MARINE INSTRUCTOR Shane Vickers
NAVAL INSTRUCTORS Justin Chapman, Mackenzie Wilsey

Naval Science Courses

For Navy-option NROTC students, the following naval science courses are required for commissioning: NS 1100, HIST 1690, NS-PC 2410, ES 3231, ES 3230, ES 3232, ES 4233, and NS-PC 4242 and their appropriate labs. For Marine-option NROTC students, the following naval science courses are required for commissioning: NS 1100, HIST 1690, NS-PC 2410, HIST 1691, HIST 1693, and NS-PC 4242 and their appropriate labs.

FIRST YEAR

NS 1100. Introduction to Naval Science. No credit toward current degree. [3]

HIST 1690. Sea Power in History. An introductory survey of the U.S. Navy's role in foreign and defense policies from the American Revolution to the present. The course also examines the broad principles, concepts, and elements of sea power throughout history. Key points will include technological advances, interservice relations, strategies, and governmental poli-

cies pertaining to sea power. This course is designed to meet the NROTC requirement. SPRING. [3] (US)

SOPHOMORE YEAR

NS-PC 2410. Leadership and Management. This course presents a comprehensive study of organizational behavior and management with special emphasis on situational leadership in the military and civilian sectors and the development of your skills in organizational thinking and problem solving. You will explore a variety of leadership and management topics, including the classical theories of management, motivation, and communication. FALL. [3]

ES 3231. Navigation. Naval piloting procedures. Charts, visual and electronic aids, and theory and operation of magnetic and gyro compasses; inland and international rules of the nautical road. The celestial coordinate system, including spherical trigonometry and application for navigation at sea. Environmental influences on naval operations. SPRING. [3]

JUNIOR YEAR

ES 3230. Ships Engineering Systems. Ship characteristics and types, including design and control, propulsion, hydrodynamic forces, stability, compartmentation, and electrical and auxiliary systems. Theory and design of steam, gas turbine, and nuclear propulsion. FALL. [3]

ES 3232. Ships Weapons Systems. Theory and employment of weapons systems, including the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. Fire control systems and major weapons types, including capabilities and limitations. Physical aspects of radar and underwater sound. Command, control, communications, computers, cyber intelligence, surveillance, and reconnaissance. SPRING. [3]

SENIOR YEAR

ES 3233. Naval Operations. A continued study of relative motion, formation tactics and ship employment. Introduction to Naval operations and operations analysis. Ship behavior and characteristics in maneuvering. Applied aspects of ship handling, afloat communications, naval command and control, naval warfare areas, and joint warfare are also included. FALL. [3]

NS-PC 4242. Leadership and Ethics. An exploration of major Western ethical philosophy in the development and application of leadership to enhance objective, sound and timely decision-making in the most challenging of environments. This course follows theoretical examination with case studies and practical application to emphasize the importance of ethical reasoning to leadership, and explores components of character and integrity in decision making. SPRING. [3]

The Marine option courses listed below are taught in the spring, rotating on a yearly basis. They are taken in the sophomore and junior year.

History 1691. Evolution of Warfare. Antiquity to the present. Evolution of strategic principles. Influence of technological, economic, moral, psychological, and political factors. Case studies from a soldier's perspective. [3] (No AXLE credit)

History 1693. Fundamentals of Maneuver Warfare. (Replaces HIST 1692 Amphibious Warfare). Broad aspects of warfare and their interactions with maneuver warfare doctrine. Specific focus on the United States Marine Corps as the premier maneuver warfare fighting institution. Historical influences on current tactical, operational, and strategic implications of maneuver warfare practices in current and future operations. Case studies. Enrollment preference to NROTC students. Repeat credit for students who have completed HIST 169D or HIST 1692. [3]

Interdisciplinary Centers, Institutes, and Research Groups

Vanderbilt is home to more than 85 centers and institutes that work to tackle major challenges and meet important societal needs by bringing together faculty from a broad range of disciplines and producing cutting-edge research. Below is a sampling of Vanderbilt's interdisciplinary initiatives. For more information, see research.vanderbilt.edu/researchadministration/centers-and-institutes-at-vanderbilt.

The Center for Integrative and Cognitive Neuroscience investigates the relationship between brain function, behavior, and cognition, and promotes the development of new technologies like advanced prosthetics and autonomous robots. cicn.vanderbilt.edu

The Center for Latin American Studies works to advance knowledge about and understanding of the region's history, culture, political economy, and social organization. as.vanderbilt.edu/clas

The Center for Medicine, Health, and Society studies the social and societal dimensions of health and illness. Scholarship, teaching, and wide-ranging collaborative projects explore medicine and science in a wide array of cultural contexts, while at the same time fostering productive dialogue across disciplinary boundaries. vanderbilt.edu/mhs

The Frist Center for Autism and Innovation at Vanderbilt University School of Engineering brings engineers, business scholars, and disabilities researchers together with experts in neuroscience and education to understand, maximize, and promote neurodiverse talent and to respond to opportunities for innovation in technology and in workplace practices. With engagement across academia, government, business, and nonprofit organizations, as well as the clinical, vocational, and self-advocacy domains, the center works to build a true community-based approach that improves lives, organizations, and society. my.vanderbilt.edu/autismandinnovation

The Max Kade Center for European and German Studies fosters an international perspective on issues relating to Europe and transatlantic relations and seeks to prepare students for international careers or advanced study. as.vanderbilt.edu/europeanstudies

The National Center on School Choice conducts scientific, comprehensive, and timely studies on school choice to inform policy and practice. peabody.vanderbilt.edu/research/pro/about_peabody_research/funded_projects

The Robert Penn Warren Center for the Humanities promotes interdisciplinary research and study in the humanities, social sciences, and natural sciences. Members of the Vanderbilt community representing a wide variety of specializations take part in the center's programs, which are designed to intensify and increase interdisciplinary discussion of academic, social, and cultural issues. vanderbilt.edu/rpw_center

The Vanderbilt Brain Institute promotes and facilitates the discovery efforts of Vanderbilt neuroscientists, the training of undergraduate and graduate students, and the coordination of public outreach in brain sciences. Research endeavors in the VBI include more than five hundred faculty, students, and staff from departments, centers, and institutes across campus who engage in neuroscience-directed research, training, and clinical service. medschool.vanderbilt.edu/brain-institute

The Vanderbilt Institute for Surgery and Engineering creates, develops, implements, and evaluates solutions to complex interventional problems. Physicians, engineers, and computer scientists work together to improve patient care with surgical innovation through engineering. Central to the mission of the institute is the translation of methods, techniques, and devices from the laboratory to the patient. vanderbilt.edu/vise

The Vanderbilt Institute for Energy and Environment elucidates the relationships among individual, institutional, and societal choices for energy production and use, and the impacts and benefits of these choices on the environment and health through links with climate, water quality, economics, social psychology, and natural resources. A crucial part of its mission is to train the next generation of leaders in the energy and environmental arena. vanderbilt.edu/viee

The Vanderbilt Institute for Global Health builds capacity through interdisciplinary global health education and training programs, conducts implementation science and research, and provides technical assistance service to government and civil sector organizations in other countries. As a leader in international education and research, VIGH seeks to improve health and well-being of people living in low-resource settings. vumc.org/global-health

The Vanderbilt Institute for Integrative Biosystems Research and Education fosters and enhances interdisciplinary research in the biophysical sciences and bioengineering at Vanderbilt, integrated with a strong focus on undergraduate, graduate, and postdoctoral education. VIIBRE's mission is to invent the tools and develop the skills that are required to understand biological systems across spatiotemporal scales. vanderbilt.edu/viibre

The Vanderbilt Institute of Chemical Biology provides research and training in the application of chemical approaches to the solution of important biomedical problems, harnessing the power of chemistry to improve human health. vanderbilt.edu/vicb

The Vanderbilt Institute of Nanoscale Science and Engineering engages in theoretical and experimental research in science and engineering at the nanoscale (from one millionth to one billionth of a meter in size). VINSE supports an extensive infrastructure of materials fabrication and analytical facilities for research in nanoscale science and engineering. vanderbilt.edu/vinse

The Vanderbilt Kennedy Center for Research on Human Development facilitates discoveries and best practices that make positive differences in the lives of persons with disabilities and their families through research, training, services, and dissemination. Nationally, it is among fourteen Eunice Kennedy Shriver Intellectual and Developmental Disabilities Research Centers, sixty-seven national University Centers for Excellence in Developmental Disabilities, fifty-two Leadership Education in Neurodevelopmental Disabilities training programs, and includes the Treatment and Research Institute for Autism Spectrum Disorders. Research, practice, and clinical experiences are available to trainees. vkc.vumc.org/vkc

The Vanderbilt University Institute of Imaging Science aims to support and integrate advances in physics, engineering, chemistry, computing, and other basic sciences for the development and application of new and enhanced imaging techniques to address problems and stimulate new research directions in biology and medicine, in health and disease. vuiis.vumc.org

The Wond'ry supports immersive experiences for students and interdisciplinary projects for faculty—from all schools and colleges—who are interested in innovation and entrepreneurship. In addition to connecting various resources across the university, the center serves as a common space for students to develop and test ideas alongside their peers with mentorship from faculty, alumni, corporate partners, the Nashville entrepreneurial community, and beyond. Programming, seminars, and workshops help students from all disciplines grow their ventures at any stage of development. vanderbilt.edu/thewondry

Life at Vanderbilt

The Ingram Commons and the First-Year Experience

All undergraduates spend their first year at Vanderbilt living on The Martha Rivers Ingram Commons. As part of Vanderbilt's residential college system, The Ingram Commons brings together first-year students, residential faculty, and professional staff in the common pursuit of discovery, creative inquiry, and engaged citizenship. With a focus on bolstering intellect, building community, developing skills for personal well-being, pursuing self-discovery, and developing cultural awareness, all members of The Ingram Commons participate in a mutual exchange of ideas and experiences. The Ingram Commons achieves that goal during the year through its ten houses, the faculty heads of house appointed to mentor students in each of them, and a first-year experience of programs, academic seminars, dinners, discussions, cultural events, social activities, lectures, and guests.

The first-year experience begins with CommonVU, a required orientation week for all first-year students. It extends from Move-In Saturday through a first week of orientation and academic classes. During CommonVU, students begin to experience the new communities of their university—in their houses, across The Ingram Commons and the university campus, and in their classrooms. Activities with each other, peer mentors and other VU upperclass students, faculty heads of house, educational staff, academic advisers, and other Vanderbilt professors introduce life at Vanderbilt.

The first-year experience also includes Vanderbilt Visions, a required first-semester university core program of mentored discussion concerning the expectations, norms, and values required for a successful transition to undergraduate life. Faculty and student VUceptors partner to lead each Vanderbilt Visions small group, whose members come from all ten Ingram Commons houses and each of the four undergraduate schools and colleges. Groups meet weekly during the fall semester. All first-year students will receive assignments to a Vanderbilt Visions group on their class schedules. More information can be found at commons.vanderbilt.edu.

Transfer Student Orientation

Transfer Student Orientation is Vanderbilt's mandatory orientation program for all transfer students. During this time, new transfer students will learn more about life at Vanderbilt through programs and activities with university staff members, faculty, and upperclass students known as Transfer Student Leaders. Transfer students will receive orientation information in the mail during the summer before arriving at Vanderbilt. Further details can be found at vanderbilt.edu/transfer.

International Student Orientation

International Student Orientation takes place in the fall of each year before the official start of classes. It is mandatory for all international students entering Vanderbilt University, and it is scheduled so that they can also attend other orientation programs required by the schools and colleges. During this time, international students will learn more about life at Vanderbilt

and interact with faculty, staff, and students. International students may also request free airport pick-up before orientation. Incoming international students are paired with current Vanderbilt students through iLEAD, a mentorship program and student organization. The main purpose of iLEAD is to create linkages between new students and the community and provide educational and social programs to ease transition and increase success at Vanderbilt.

The Vanderbilt Honor Code and the Honor System

Vanderbilt University takes pride in its honor code and its student-run honor system.

The honor code is shared by all ten schools of the university:

Vanderbilt University students pursue all academic endeavors with integrity. They conduct themselves honorably, professionally, and respectfully in all realms of their studies in order to promote and secure an atmosphere of dignity and trust. The keystone of our honor system is self-regulation, which requires cooperation and support from each member of the University community.

The Honor System is a time-honored tradition that began with the first classes at Vanderbilt in 1875. Students established the system and continue to manage it today. It rests on the presumption that all work submitted as part of course requirements is produced by the student, without help from any other source unless acknowledgement is given in a manner prescribed by the instructor. Cheating, plagiarizing, or otherwise falsifying results of study are specifically prohibited. The system applies not only to examinations but also to written work and computer programs submitted to instructors. Detailed descriptions of Honor System violations and Undergraduate Honor Council procedures are published in the *Student Handbook*, available on the web at vanderbilt.edu/student_handbook.

Responsibility for the preservation of the system falls on the individual student who, by registration, acknowledges the authority of the Undergraduate Honor Council. Students are expected to demand of themselves and their fellow students complete respect for the Honor Code. Ignorance of the regulations is not a defense for abuse of regulations. All incoming students attend a mandatory signing ceremony and educational program on the Honor System at the beginning of the fall semester. Additional information about the Honor System is available on the web at studentorgs.vanderbilt.edu/HonorCouncil.

Student Accountability

All students who take courses, live in residence halls, or otherwise participate in the activities of the university are within the jurisdiction of the university's student accountability system, whether or not they are registered primarily at Vanderbilt. Policies governing student conduct are published in the *Student Handbook*, on the web at vanderbilt.edu/studentaccountability, or by other reasonable means of notification. The Office of Student Accountability, Community Standards, and Academic

Integrity has original jurisdiction over all matters of nonacademic misconduct involving students.

Official University Communications

Certain federal statutes require that information be delivered to each student. Vanderbilt delivers much of this information via email. Official electronic notifications, including those required by statutes, those required by university policy, and instructions from university officials, will be sent to students' Vanderbilt email addresses: *user.name@vanderbilt.edu*. Students are required to be familiar with the contents of official university notifications, and to respond to instructions and other official correspondence requiring a response. Some messages will include links to the YES Communications Tool, which is a secure channel for official communication of a confidential nature. However, students should not wait to receive such a message, and should check YES frequently to remain current on official, confidential communications.

The university makes every effort to avoid inundating students with nonessential email (often called "spam"), and maintains separate lists from which students may unsubscribe for announcements of general interest.

Residential Living

Vanderbilt University requires all unmarried undergraduate students to live in university housing on campus for their entire undergraduate career. This commitment to residential education is clearly expressed in the university's residential requirement: "All unmarried undergraduate students must live in residence halls on campus during the academic year, May session, and summer sessions. Authorization to live elsewhere is granted at the discretion of the director of housing assignments in special situations or when space is unavailable on campus" (*Student Handbook*).

Residential living at Vanderbilt began in the 1880s when six cottages were constructed in response to a demand for on-campus housing. In the fall of 2018, 6,237 students lived on campus, comprising about 95 percent of the undergraduate student body. Housing for graduate and professional students is not available on campus.

Undergraduate Housing

Several types of housing are offered to meet the needs of a diverse student body—suites, singles, doubles, apartments, and lodges.

Some housing is segregated by gender; most housing is coresidential. In the coresidential areas, men and women may be housed in different living spaces on the same floor.

Six officers from each fraternity and sorority may live in their fraternity or sorority houses.

TeleVU, the residence hall cable system, and ResNet, the residential data network, are available in each accommodation on campus. Residents with personal computers can connect to ResNet for high-speed data services. All residence halls provide wireless access to ResNet.

First-Year Students

First-year students live on The Martha Rivers Ingram Commons. The Ingram Commons comprises ten residential houses, the home of the dean of The Ingram Commons, and The Commons Center. The ten houses are Crawford, East, Gillette, Hank Ingram,

Memorial, Murray, North, Stambaugh, Sutherland, and West. Each house is led by a resident faculty head of house.

East, Gillette, Memorial, North, and West houses are historical buildings renovated for The Ingram Commons. Crawford, Hank Ingram, Murray, Stambaugh, and Sutherland were constructed between 2006 and 2008. All houses are air conditioned and fully sprinklered for fire safety. Access to all residence halls is controlled with a card access system. Students on The Ingram Commons live in traditional double or triple rooms. All student rooms have basic room furnishings that include loftable bed, chest, desk, chair, closet, and window blinds. Lounges, study rooms, seminar rooms, music practice rooms, and laundry facilities are located within The Ingram Commons.

Upperclass Students

Upperclass students live in nineteen residence halls in six residential areas on the central campus: Warren and Moore colleges, E. Bronson Ingram College, Alumni Lawn, Carmichael Towers, Branscomb Quadrangle, and Highland Quadrangle. All residence halls are air conditioned and are fully equipped with sprinklers for fire safety. Access to all residence halls is controlled with a card access system.

Warren and Moore colleges and E. Bronson Ingram College are the first three residential colleges for upperclass students. Together, the three colleges house 990 students comprised by parity among genders. One-third of the spaces are designated for each class cohort—seniors, juniors, and sophomores. A faculty head lives in each college and each is assisted by graduate fellows. Each college offers a mix of living accommodations: suites for six, five, and four students; traditional double rooms; and traditional single rooms.

Alumni Lawn comprises McGill Hall, Cole and Tolman halls, and McTyeire International House. McGill Hall houses approximately one hundred students in primarily single rooms with community bath facilities on each floor. Housing slightly more than one hundred students each in single rooms, Cole and Tolman halls house female and male populations, respectively. McTyeire International House houses approximately one hundred students in single rooms with community bath facilities on each floor.

Upperclass students are also housed in the fourteen-story Carmichael Towers complex located on West End Avenue. Carmichael has two styles of living arrangements: (a) single and double rooms arranged in six-person suites with bath, kitchen, and common area and (b) single and double rooms arranged on halls, with community bath facilities on each floor. The Towers are complete with lounges, meeting rooms, laundry facilities, recreation areas, music practice rooms, a convenience store, and a Food Court.

Branscomb Quadrangle (Lupton, Scales, Stapleton, and Vaughn) offers two physical arrangements: (a) double rooms with a community bath on each floor and (b) suites of two double rooms connected by a half bath (with a community bath on each floor). The complex contains laundry facilities, lounges, study rooms, music practice rooms, and a quick-service restaurant and convenience store.

At the south end of the campus is Highland Quadrangle comprising Chaffin Place, Lewis House, Morgan House, and Mayfield Place. Chaffin contains two-bedroom apartments that house four students. Students share efficiencies and one- and two-bedroom apartments in Morgan and Lewis houses. In Mayfield, units of ten single rooms cluster around a two-story living room area. A laundry facility and a convenience store are located in this residential area.

Living Learning Communities

McGill Hall is the home of the McGill Project, designed to stimulate and foster discussion and exploration of philosophical issues between students and faculty. Faculty members meet with residents in McGill for informal discussion (open to all students) and formal class work. Residents also plan and participate in social events hosted by the student-run McGill Council. A faculty-in-residence lives on the first floor.

The goals of the McTyeire International House language programs are to improve the fluency of McTyeire Hall residents in Chinese, French, German, Japanese, Russian, or Spanish languages, and to expand communication between international and American students by means of discussions, programs, and international coffees and festivals. An international interest hall is offered in English for students with interest in global citizenship. Space is available for ninety-six upperclass students in single rooms. Living in McTyeire carries a commitment to take a predetermined number of weekly meals in the McTyeire dining room.

Mayfield Place is the site for the Mayfield Living Learning Lodge program. Lodges are set aside for groups of ten students who want to establish their own special-interest lodges. Such programs have included arts, community service, computers, environment/recycling, world religions, music, and wellness. Each lodge selects a faculty adviser who provides guidance throughout the year.

Residential Education Administration

The residential community at Vanderbilt is divided into seven geographic areas, each of which has a full-time professional living on campus. Upperclass and graduate or professional students serve as head residents and resident advisers in the residence halls. The dean of students, eight area coordinators, and six graduate area coordinators also live on campus. For more information, go to vanderbilt.edu/ResEd.

Residence halls for first-year students have RAs on each floor. Area coordinators and their student staff are responsible for maintaining an atmosphere conducive to the students' general welfare and education.

Vanderbilt Student Government (VSG) plans programs and recreational and social activities, and advises the residential affairs administration on policy matters.

Room Assignment

First-Year Students. First-year students may apply for housing after payment of their matriculation fees. Students will be assigned to double or triple rooms. Roommate requests are considered. However, when the supply of double rooms is exhausted, roommate requests will not be honored for students assigned to triple rooms. Admission to the university does not guarantee assignment to a particular building, kind of room, or a particular roommate or hallmate.

Returning Upperclass Students. Returning unmarried upperclass students receive their housing assignments through a random selection process in the spring. Students who want to remain in the same rooms may reserve their rooms. Eligibility for participation is determined by the director of housing assignments with advice from VSG. A specific number of current residents of a suite, apartment, or lodge must return in order to reserve that living space.

Transfer and Former Students. Requests for room assignments by new transfer students and former students returning to campus are made through the Office of Housing and

Residential Experience, and are determined by the date of deposit. The university tries to accommodate as many transfer students as possible, but acceptance at Vanderbilt does not guarantee campus housing.

The Commodore Card

The Commodore Card is the Vanderbilt student ID card. It can be used to access debit spending accounts, VU meal plans, and campus buildings such as residence halls, libraries, academic buildings, and the David Williams II Student Recreation and Wellness Center.

ID cards are issued at the Commodore Card Office, 184 Sarratt Student Center, Monday through Friday from 8:30 a.m. to 4:00 p.m. For more information, go to vanderbilt.edu/cardservices.

Eating on Campus

Vanderbilt Campus Dining's meal plan program is accepted at all locations across campus and gives students comprehensive dining options. Features include extended hours, multiple locations, variety, special events, Meal Money, Taste of Nashville (ToN) program, and Guest Meals. Vanderbilt students living on campus are required to participate in the following meal plans: first-year students are on the 21 Plan (twenty-one meals per week), sophomores are on the 19 Plan (nineteen meals per week), juniors are on the 14 Plan (fourteen meals per week), and seniors are on the 8 Plan (eight meals per week). Juniors may purchase the nineteen meal plan and seniors may purchase the nineteen meal plan. There are a variety of options conveniently located across campus: The Ingram Commons dining hall, Rand Dining Center, E. Bronson Ingram dining hall, Pub at Overcup Oak at Sarratt, Grins Vegetarian Café at the Schulman Center, Local Java at Sarratt, the Kitchen at Kissam, Highland Munchie, and 2301 at Rand Lounge. Vanderbilt Campus Dining also operates five convenience stores including Kissam Munchie, Branscomb Munchie, Rand Munchie, Highland Munchie, and Common Grounds at The Commons Center. For more information on Vanderbilt Campus Dining please visit campusdining.vanderbilt.edu.

Barnes & Noble at Vanderbilt

Barnes & Noble at Vanderbilt, the campus bookstore located at 2525 West End Avenue, offers textbooks (new, used, digital, and rental), computers, supplies, dorm accessories, licensed Vanderbilt merchandise, and best-selling books. The bookstore features extended hours of operation and hosts regular special events. Visitors to the bookstore café can enjoy Starbucks coffees, sandwiches, and desserts while studying. Free customer parking is available in the 2525 garage directly behind the bookstore. For more information, visit vubookstore.com, follow twitter.com/BN_Vanderbilt, find the bookstore on Facebook at facebook.com/VanderbiltBooks, or call (615) 343-2665.

Services to Students

Student Records (Family Educational Rights and Privacy Act)

Vanderbilt University is subject to the provisions of federal law known as the Family Educational Rights and Privacy Act (also referred to as FERPA). This act affords matriculated students

certain rights with respect to their educational records. These rights include:

1. The right to inspect and review their education records within 45 days of the day the University receives a request for access. Students should submit to the Office of the University Registrar written requests that identify the record(s) they wish to inspect. The Office of the University Registrar will make arrangements for access and notify the student of the time and place where the records may be inspected. If the Office of the University Registrar does not maintain the records, the student will be directed to the University official to whom the request should be addressed.
2. The right to request the amendment of any part of their education records that a student believes is inaccurate or misleading. Students who wish to request an amendment to their educational record should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the University decides not to amend the record as requested by the student, the student will be notified of the decision and advised of his or her right to a hearing.
3. The right to consent to disclosures of personally identifiable information contained in the student's education records to third parties, except in situations that FERPA allows disclosure without the student's consent. These exceptions include:
 - Disclosure to school officials with legitimate educational interests. A "school official" is a person employed by the University in an administrative, supervisory, academic or research, or support-staff position (including University law enforcement personnel and health staff); contractors, consultants, and other outside service providers with whom the University has contracted; a member of the Board of Trust; or a student serving on an official University committee, such as the Honor Council, Student Conduct Council, or a grievance committee, or assisting another school official in performing his or her tasks. A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibility.
 - Disclosure to parents if the student is a dependent for tax purposes.
 - Disclosure to appropriate individuals (e.g., parents/guardians, spouses, housing staff, health care personnel, police, etc.) where disclosure is in connection with a health or safety emergency and knowledge of such information is necessary to protect the health or safety of the student or other individuals.
 - Disclosure to a parent or legal guardian of a student, information regarding the student's violation of any federal, state, or local law, or of any rule or policy of the institution, governing the use or possession of alcohol or a controlled substance if the University has determined that the student has committed a disciplinary violation with respect to the use or possession and the student is under the age of 21 at the time of the disclosure to the parent/guardian.
 - Disclosure to various authorized representatives of government entities (such as, compliance with Student and Exchange Visitors Information System [SEVIS], Solomon Amendment, etc.).

FERPA provides the university the ability to designate certain student information as "directory information." Directory information may be made available to any person without the student's consent unless the student gives notice as provided for, below. Vanderbilt has designated the following as directory information: the student's name, address, telephone number, email address, student ID photos, major field of study, school, classification, participation in officially recognized activities and sports, weights and heights of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended by the student, and other information that would not generally be considered harmful or an invasion of privacy if disclosed. Any student who does not wish

disclosure of directory information should notify the Office of the University Registrar in writing. No element of directory information as defined above is released for students who request nondisclosure except as required by statute.

The request for nondisclosure does not apply to class rosters in online class management applications, or to residential rosters—or rosters of groups a student may join voluntarily—in online, co-curricular engagement applications, or rosters of other information on the websites of student organizations that a student may join. Neither class rosters in online class management applications, nor residential rosters in online co-curricular engagement applications, are available to the public.

As of January 3, 2012, the U.S. Department of Education's FERPA regulations expand the circumstances under which students' education records and personally identifiable information (PII) contained in such records—including Social Security Numbers, grades, or other private information—may be accessed without consent. First, the U.S. Comptroller General, the U.S. Attorney General, the U.S. Secretary of Education, or state and local education authorities ("Federal and State Authorities") may allow access to student records and PII without consent to any third party designated by a Federal or State Authority to evaluate a federal- or state-supported education program. The evaluation may relate to any program that is "principally engaged in the provision of education," such as early childhood education and job training, as well as any program that is administered by an education agency or institution.

Second, Federal and State Authorities may allow access to education records and PII without consent, to researchers performing certain types of studies, in certain cases even when the University objects to or does not request such research. Federal and State Authorities must obtain certain use-restriction and data security promises from the third parties that they authorize to receive PII, but the Authorities need not maintain direct control over the third parties.

In addition, in connection with Statewide Longitudinal Data Systems, State Authorities may collect, compile, permanently retain, and share without student consent, PII from education records, and may track student participation in education and other programs by linking such PII to other personal information that they obtain from other Federal or State data sources, including workforce development, unemployment insurance, child welfare, juvenile justice, military service, and migrant student records systems.

If a student believes the university has failed to comply with FERPA, he or she may file a complaint using the Student Complaint and Grievance Procedures as outlined in the *Student Handbook*. If dissatisfied with the outcome of this procedure, students may file a written complaint with the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue SW, Washington, DC 20202-5920.

Questions about the application of the provisions of the Family Educational Rights and Privacy Act should be directed to the Office of the University Registrar or to the Office of General Counsel.

Vanderbilt Directory

Individual listings in the online People Finder Directory consist of the student's full name, Vanderbilt email address, and campus mailing address (if available). Students may elect to add additional contact information to their listings, including school, academic classification, local phone number, local address, permanent address, cellphone, pager, and fax numbers. Student

listings in the People Finder Directory are available to the Vanderbilt community via logon ID and e-password. Students may choose to make their online People Finder listings available to the general public (i.e., viewable by anyone with access to the internet), or to block individual directory items. Students who have placed a directory hold with the Office of the University Registrar will not be listed in the online directory.

Directory information should be kept current. Students may report address changes, emergency contact information, and missing person contact information via the web by logging in to YES (Your Enrollment Services) <https://yes.vanderbilt.edu> and clicking on the Personal Information link.

Counseling and Advisory Services

Advising is an important part of Vanderbilt's central mission to help each student achieve individual goals. Many support services are provided, including pre-major and major academic advising and career and personal counseling. Residence hall staff are continuously on call.

Deans and professional staff in academic programs, in all areas of the Office of the Dean of Students, and in other areas of the university offer counseling and advising services to students:

- Career Center
- Center for Student Wellbeing
- College of Arts and Science's Pre-major Academic Advising Resources (CASPAR)
- English Language Center
- Equal Employment Opportunity
- Faculty Advisers
- Health Professions Advisers
- International Student and Scholar Services
- Margaret Cuninggim Women's Center
- Office of Housing and Residential Experience
- Office of LGBTQI Life
- Office of Student Care Coordination
- Office of Student Leadership Development
- Office of Student Organizations
- Office of the University Chaplain and Religious Life
- Pre-Business Advisers
- Pre-Law Advisers
- STEM Help Desks in The Ingram Commons
- STEM Help Desks in Featheringill
- Student Access Services
- Student Health Center
- Teacher Education Adviser, Arts and Science
- Teacher Licensure Office, Peabody College
- Title IX and Student Discrimination
- Tutoring Services
- University Counseling Center
- Writing Studio

Career Center

Vanderbilt graduates go everywhere and their careers are not necessarily tied to their majors. The Career Center prepares students for life after Vanderbilt by helping them explore career options, develop experience through internships, discover their strengths, and build resilience to be competitive in a rapidly changing world of employment.

The Employer Relations team builds relationships with key employers, nationally and internationally, to support a robust on-campus recruiting program as well as provide Career

Fairs, Industry Slams, Information Sessions, and other activities designed to inform and connect students with a broad spectrum of career opportunities. Professional career coaches provide comprehensive career assistance to undergraduate students of all majors. Services include resume and cover letter editing, social media campaign development, mock interviews, and special workshops and programs. The Career Center also supports students seeking scholarships and fellowships, including the Rhodes, Marshall, and Fulbright.

Students can begin mapping out their futures by meeting with a career coach during walk-in hours or by scheduling an appointment. By working with a career coach, students can explore their interests in various fields, learn how to tell the story of their education and experience, and apply to work in whatever field of employment interests them. For more information about the Career Center, visit vanderbilt.edu/career.

Services for Students with Disabilities

Vanderbilt is committed to the provisions of the Rehabilitation Act of 1973 and Americans with Disabilities Act as it strives to be an inclusive community for students with disabilities. Students seeking accommodations for any type of disability are encouraged to contact Student Access Services. Services include, but are not limited to, extended time for testing, assistance with locating sign language interpreters, audio textbooks, physical adaptations, notetakers, reading services, and reasonable accommodations for housing and dining. Accommodations are tailored to meet the needs of each student with a documented disability. Specific concerns pertaining to services for people with disabilities or any disability issue should be directed to the Disability Program Director, Student Access Services, PMB 407726, 2301 Vanderbilt Place, Nashville, Tennessee 37240-7726; phone (615) 343-9727; fax (615) 343-0671; vanderbilt.edu/student-access.

Nondiscrimination, Anti-Harassment, Anti-Retaliation, and Sexual Misconduct

The Title IX and Student Discrimination Office (vanderbilt.edu/title-ix) and/or the Equal Employment Opportunity Office (vanderbilt.edu/eeo) investigate allegations of prohibited discrimination, harassment, and retaliation involving members of the Vanderbilt community. This includes allegations of sexual misconduct and other forms of power-based personal violence. Director of Title IX and Student Discrimination Molly Zlock is Vanderbilt's Title IX coordinator.

If you believe that a member of the Vanderbilt community has engaged in prohibited discrimination, harassment, or retaliation, please contact the Title IX and Student Discrimination Office and/or the Equal Employment Opportunity Office. If the offense is criminal in nature, you may file a report with Vanderbilt University Police Department.

The Title IX and Student Discrimination Office also facilitates interim accommodations for students impacted by sexual misconduct and power-based personal violence. Some examples of interim accommodations include no contact orders, adjusted course schedules, and housing changes.

Specific concerns pertaining to prohibited discrimination, harassment, or retaliation, including allegations of sexual misconduct and other forms of power-based personal violence, should be directed to the Title IX and Student Discrimination Office at (615) 343-9004.

Student Care Network

The Student Care Network is a holistic network of services and resources pertaining to health and wellness available to all Vanderbilt University students. Primary offices include the Office of Student Care Coordination, the University Counseling Center, the Student Health Center, and the Center for Student Wellbeing. Students also have access to a wide range of additional on-campus and community resources through the Student Care Network—from the David Williams II Student Recreation and Wellness Center to the Project Safe Center to a variety of community providers. To facilitate finding resources, students may refer to the Student Care Network website, or contact the Office of Student Care Coordination, vanderbilt.edu/studentcarenetwork.

Office of Student Care Coordination

The Office of Student Care Coordination is committed to supporting undergraduate, graduate, and professional students in successfully navigating life events related to academic stress and/or medical, mental health, and/or other personal concerns that may interfere with a student's ability to achieve their academic and personal goals. This team of "care coordinators" is the central and first point of contact for students to help identify needs and determine the most appropriate resources in Vanderbilt's Student Care Network and in the Nashville community to address concerns. Student Care Coordinators work collaboratively with students to develop a student success plan, share education about and facilitate connections to appropriate on- and off-campus resources, and provide accountability through supportive follow-up meetings. Our goal is for students to have the right support, in the right place, at the right time. In addition, the Office of Student Care Coordination coordinates support for students returning from medical leaves of absence. Though staff typically have a background in mental health services, it is important to understand that work with a Student Care Coordinator is not counseling or therapy.

Many students face challenges during their educational experiences and each situation is unique. The Office of Student Care Coordination is the first step to determine where to go for the most appropriate support for your needs. Students are encouraged to visit vanderbilt.edu/carecoordination to complete an initial assessment and schedule an appointment to meet with a Student Care Coordinator. Students may also call (615) 343-WELL (on-campus: 3-9355) or drop in to see a Student Care Coordinator, Monday–Friday, 8 a.m. to 5 p.m., Sarratt Student Center|Rand Hall, Suite 305.

University Counseling Center

As a key component of the Vanderbilt Student Care Network, the UCC provides mental health assessment, support, and treatment for all students enrolled at Vanderbilt, including undergraduate, graduate, and professional students.

Highly skilled and multidisciplinary teams of professionals offer crisis intervention, substance abuse counseling, short-term individual counseling, group therapy, biofeedback, ADHD and learning disorder assessments, and psychiatric assessment and pharmacologic treatment. Treatment plans are tailored to each individual's unique background and needs. UCC professionals support the university's mission of fostering inclusive excellence through cultural awareness and competence. In addition to regular hours and evening/weekend crisis response, the UCC offers various "Let's Talk" locations.

To access UCC services, visit vanderbilt.edu/ucc or the

Office of Student Care Coordination's website at vanderbilt.edu/carecoordination or call the OSCC at (615) 343-WELL (9355). For immediate crisis support or to speak with someone at the UCC after business hours, call the UCC at (615) 322-2571.

Student Health Center

The Student Health Center provides primary care services for students and is staffed by physicians, nurse practitioners, nurses, and lab technicians. The Student Health Center provides services similar to those provided in a private physician's office or HMO, including routine medical care, specialty care (e.g. nutrition and sports medicine), and some routine lab tests. Most of the services students receive at the Student Health Center are pre-paid, but those services that are not are the responsibility of students to coordinate with their health insurance.

When the university is in session, during fall and spring semesters, the Student Health Center is open Monday through Friday from 8:00 a.m. to 4:30 p.m. Students should call ahead to schedule an appointment at (615) 322-2427 or online at vumc.org/student-health/online-appointments. Students with urgent problems will be seen on a same-day basis. They will be given an appointment that day, or "worked in" on a first-come, first-served basis, if no appointments are available.

Emergency consultation services are available from on-call professionals at (615) 322-2427 when the Student Health Center is closed. For more detailed information on the services available at the Student Health Center and information on other health-related topics, please visit the Student Health Center website at vumc.org/student-health.

Immunization Requirements

The State of Tennessee requires certain immunizations for all students on university campuses. As such, Vanderbilt University will block student registration for those who are not in compliance with the requirements.

The requirements include:

1. *Meningococcal meningitis vaccine (one injection)* administered at age 16 or older for all incoming students living in on-campus housing.
2. *Varicella vaccine (two injections)* is required for all students who have not had documented chickenpox history. Positive titer results are also accepted.
3. *Measles, mumps, and rubella (2 injections)* for all incoming students. Positive titer results are also accepted.

The Student Health Center requires all incoming students to complete a Health Questionnaire that includes further information regarding the state-mandated vaccinations, as well as information on other strongly recommended vaccinations.

Information regarding this Health Questionnaire is communicated to students by email after admission to Vanderbilt University. This Health Questionnaire must be returned to the Student Health Center by May 15 with vaccination information.

Students should go to vumc.org/student-health/immunization-requirements-new-students in order to access more information regarding the immunization requirements and information on how to upload their documentation via the secure student health portal.

Student Health Insurance Plan

All degree-seeking students, with the exception of Division of Unclassified Studies (DUS) students, who are registered for 4

or more credit hours, are required to have health insurance coverage. The university offers a sickness and injury insurance plan that is designed to provide hospital, surgical, and major medical benefits. A brochure explaining the benefits of insurance coverage is available to students online at gallagherstudent.com/vanderbilt or vumc.org/student-health/student-health-insurance.

The annual premium is in addition to tuition and is automatically billed to the student's account. Coverage extends from August 12 until August 11 of the following year, whether a student remains in school or is away from the university.

A domestic student who does not want to subscribe to the insurance plan offered through the university must complete an online waiver form indicating other insurance coverage at gallagherstudent.com/vanderbilt. This process must be completed by August 1 for students enrolling in the fall. Newly enrolled students for the spring term must complete the online waiver process by January 2. The online waiver process must be completed by August 1 every year in order to waive participation in and the premium for the Student Injury and Sickness Plan.

Family Coverage: Students who want to obtain coverage for their families (spouse, children) may do so at gallagherstudent.com/vanderbilt. Additional premiums are charged for family health insurance coverage and cannot be put on a student's VU account.

International Student Coverage

International students and their dependents residing in the United States are required to purchase the university's international student injury and sickness insurance. This insurance is required for part-time as well as full-time students.

Center for Student Wellbeing

The Center for Student Wellbeing seeks to create a campus culture that supports students in cultivating lifelong well-being practices. The center offers individual coaching appointments to help students develop and maintain skills that will contribute to personal and academic success, and provides workshops on a variety of topics, including resiliency, time management, alcohol and other drug education, and healthy living. Students may use the center's meditation room for yoga, meditation, and mindfulness classes, or for self-guided practice. The center also works closely with many campus partners, including the University Counseling Center, the Student Health Center, the Office of Housing and Residential Experience, and the academic deans to provide resources and support for students who may be facing personal or academic challenges.

The Center for Student Wellbeing is centrally located on campus at 1211 Stevenson Center Lane, across from the Student Health Center, and is open Monday through Friday, 8:00 a.m. to 5:00 p.m. For more information, please call (615) 322-0480 or visit vanderbilt.edu/healthydores.

Project Safe Center

The Project Safe Center partners with students, faculty, and staff to create a campus culture that rejects sexual violence and serves as a resource for all members of the Vanderbilt community. The Project Safe Center provides support to survivors of intimate partner violence and engages the campus community in prevention of sexual assault, dating violence and domestic violence, and stalking.

Bystander intervention training, an online education module addressing sexual violence, and a variety of programs and presentations on consent, healthy relationships, and violence prevention are available through the Project Safe Center. A 24-hour support hotline answered by Project Safe's victim resource specialists is available at (615) 322-SAFE (7233).

The Project Safe Center located at 304 West Side Row is open Monday through Friday, 8:00 a.m. to 5:00 p.m. For more information, please call (615) 875-0660 or visit vanderbilt.edu/projectsafe.

Vanderbilt Child and Family Center

Vanderbilt Child and Family Center provides support and resources to the community of Vanderbilt families across the spectrum of life. As reflected in our provision of new parent support, early childhood education, family life resources, and elder care support, VCFC values the university's commitment to the education of the whole person and cultivation of lifelong learning. Visit vanderbilt.edu/child-family-center.

Inclusive Excellence

Diversity, inclusion, and community engagement are essential cornerstones of Vanderbilt's commitment to equity and trans-institutional discovery and learning. The Office for Inclusive Excellence has as its mission to work in partnership with members of the Office of the Provost and Vanderbilt colleges and schools to ensure that we advance the success and affirmation of all students and faculty. The Office for Inclusive Excellence oversees and establishes strategic initiatives to promote academic success, professional and cultural education, and inclusivity and belonging. Visit vanderbilt.edu/inclusive-excellence for more information.

Bishop Joseph Johnson Black Cultural Center

The Bishop Joseph Johnson Black Cultural Center provides educational and cultural programming designed to highlight the history and cultural experiences of African Americans. Initially referred to as "the Afro House," in 1984, the center was named in honor of the first African American student admitted to Vanderbilt University in 1953, Bishop Joseph Johnson (B.D. '54, Ph.D. '58). The BCC activities focus on providing student support and development, campus enrichment, and community engagement.

Student Support and Development (Inclusion)

One of the major aims of the BCC is student support and development. To accomplish this objective, the BCC offers student-driven programming, mentoring initiatives, organizational meeting spaces, service opportunities, and leadership skills training. The BCC also serves as a haven for students, with opportunities for informal fellowship with other students of all levels and backgrounds as well as with faculty and staff.

Campus Enrichment (Diversity)

With campus programming focused on Africans and African Americans, the BCC enriches the overall campus environment by promoting intercultural competence. Specifically, the BCC works with numerous campus partners to sponsor lectures, musical performances, art exhibitions, films, and discussions on African and African American history and culture.

Community Engagement (Equity)

Additionally, the BCC engages in community outreach and service by working with various civic and cultural groups in the Nashville area. Through community programs and by supporting students as they tutor and mentor young people from underserved areas in the city, the BCC advocates for social justice and equity on campus and in the larger community.

The BCC is located in the center of campus directly behind Buttrick Hall and across from the main campus mailroom. For more information, please call (615) 322-2524 or visit vanderbilt.edu/bcc.

English Language Center

Students wishing to focus on improving their English language use for the context of the U.S. academic setting may take classes and participate in programming at the ELC to support their academic success. The ELC's courses include Academic Speaking, *writeELC*, and Pronunciation. Throughout the academic year, academic workshops and one-to-one consultations for speaking and writing are also available through the ELC. The ELC is located at 1208 18th Avenue South. For more information, please visit vanderbilt.edu/elc.

International Student and Scholar Services

ISSS provides immigration advising and services, including the processing of immigration paperwork, to international students and scholars. The office works with admission units, schools, and departments to generate documentation needed to bring nonimmigrant students and scholars to the U.S. Further, ISSS keeps abreast of the regulations pertaining to international students and scholars in accordance with the Departments of Homeland Security and State. ISSS advising staff are available to support students' and scholars' requests through email, phone calls, daily drop-in hours (1:30–3:30 p.m., Monday–Friday), and private appointments. ISSS puts a strong emphasis on providing employment workshops to inform international students about professional development and employment options while enrolled and after graduation. ISSS conducts regular workshops on Curricular Practical Training (CPT), Optional Practical Training (OPT), and Academic Training (AT). ISSS also supports more than 300 alumni international students who have already graduated and are either on OPT or AT work permission.

Margaret Cuninggim Women's Center

The Margaret Cuninggim Women's Center leads co-curricular campus initiatives related to women's and gender issues. The center partners with many departments, programs, and individuals across campus to raise awareness about the ways in which gender shapes and is shaped by our lived experiences. Because its aim is to make the Vanderbilt community more inclusive and equitable, the center encourages all members of the Vanderbilt community to take part in its events and resources.

The Women's Center celebrates women and their accomplishments and fosters empowerment for people of all identities. The center offers individual support and advocacy around a variety of issues, including gender stereotyping, gender equity, leadership, parenting, body image, disordered eating, pregnancy and reproduction, sexual health, and more. The Women's

Center is open Monday through Friday, 8:00 a.m. to 5:00 p.m. and is located at 316 West Side Row. For more information, please call (615) 322-4843 or visit vanderbilt.edu/womenscenter.

Office of LGBTQI Life

The Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex (LGBTQI) Life office is a welcoming space for individuals of all identities and a resource for information and support about gender and sexuality. LGBTQI Life serves the entire Vanderbilt community through education, research, programming, support, and social events. The office also serves as a comfortable study and socializing space, as well as a connection point to the greater Nashville LGBTQI community. In addition, LGBTQI Life conducts tailored trainings and consultations for the campus and community. The Office of LGBTQI Life is located in the K. C. Potter Center, Euclid House, 312 West Side Row. For more information, please visit vanderbilt.edu/lgbtqi.

Schulman Center for Jewish Life

The 10,000-square-foot Ben Schulman Center for Jewish Life is the home of Vanderbilt Hillel. The goal of the center is to provide a welcoming community for Jewish students at Vanderbilt and to further religious learning, cultural awareness, and social engagement. Vanderbilt Hillel is committed to enriching lives and enhancing Jewish identity. It provides a home away from home, where Jews of all denominations come together, united by a shared purpose. The Schulman Center is also home to Grin's Cafe, Nashville's only kosher and vegetarian restaurant. For further information about the Schulman Center, please call (615) 322-8376 or email hillel@vanderbilt.edu.

Office of the University Chaplain and Religious Life

The Office of the University Chaplain and Religious Life provides opportunities to explore and practice religion, faith, and spirituality and to more deeply understand one's personal values and social responsibility via educational programming, encounters with various faith perspectives, and engagement with religious and spiritual communities. The office welcomes and serves all students, faculty, and staff and provides an intellectual home and ethical resource for anyone in the Vanderbilt community seeking to clarify, explore, and deepen understanding of their lives and/or faith.

Recognizing the importance of exploring one's faith in community, the office facilitates opportunities for individuals of a shared faith to worship/practice their particular religious tradition. Whether guided by one of our affiliated chaplains or a student-run religious organization, these groups foster a sense of community and common values. For a complete listing of campus religious groups, resources, services, and programming opportunities, visit vanderbilt.edu/religiouslife.

Parking and Vehicle Registration

Parking space on campus is limited. Motor vehicles operated on campus at any time by students, faculty, or staff must be registered with Parking Services located at 28th Avenue South in the 2800 Building. A fee is charged. Parking regulations are published annually and are strictly enforced. More information is available at vanderbilt.edu/parking.

Freshmen may not purchase a parking permit or park on campus at any time. Bicycles must be registered with Vanderbilt University Public Safety.

Vanderbilt University Police Department

The Vanderbilt University Police Department, (615) 322-2745, is a professional law enforcement agency dedicated to the protection and security of Vanderbilt University and its diverse community (police.vanderbilt.edu).

The Vanderbilt University Police Department comes under the charge of the Office of the Vice Chancellor for Administration. As one of Tennessee's larger law enforcement agencies, the Vanderbilt University Police Department provides comprehensive law enforcement and security services to all components of Vanderbilt University including the academic campus, Vanderbilt University Medical Center, Vanderbilt Health at One Hundred Oaks, and a variety of university-owned facilities throughout the Davidson County area.

The Police Department includes a staff of more than one hundred people, organized into three divisions under the Office of the Associate Vice Chancellor and Chief of Police: Operations Division (Main Campus, Medical Center, and 100 Oaks Precincts), Administrative Division, and Auxiliary Services Division. All of Vanderbilt's commissioned police officers have completed officer training at a state-certified police academy and are required to complete on-the-job training as well as attend annual in-service training. Vanderbilt police officers hold Special Police Commissions and have the same authority as that of a municipal law enforcement officer, while on property owned by Vanderbilt, on adjacent public streets and sidewalks, and in nearby neighborhoods. When a Vanderbilt student is involved in an off-campus offense, police officers may assist with the investigation in cooperation with local, state, or federal law enforcement. The department also employs non-academy-trained officers called community service officers (commonly referred to as CSOs) who lend assistance 24/7 to the Vanderbilt community through services that include providing walking escorts, providing jump starts, and unlocking cars. For non-emergency assistance from a community service officer, dial (615) 322-2745 (2-2745 from an on-campus extension).

The Vanderbilt University Police Department provides several services and programs to members of the Vanderbilt community:

Vandy Vans—The Vanderbilt University Police Department administers the Vandy Vans escort system at Vanderbilt University. The Vandy Vans escort system provides vehicular escorts to designated locations on campus. The service consists of vans that operate from 6:00 p.m. to 3:30 a.m. GPS technology allows students to track Vandy Vans on their route via computer or mobile phone using the VandySafe app, setting up text message alerts to let them know when a van will be arriving at their stop. Please visit police.vanderbilt.edu/services/vandysafe.php to download the app.

Stop locations were chosen based on location, the accessibility of a secure waiting area, and student input. Signs, freestanding or located on existing structures, identify each stop. A walking escort can be requested to walk a student from his/her stop to the final destination. A van is also accessible to students with mobility impairments. For complete information about the Vandy Vans service, including routes, stops, and times, please visit vandyvans.com or call (615) 322-2554.

As a supplement to the Vandy Vans van service, walking escorts are available for students walking to and from any

location on campus during nighttime hours. Walking escorts are provided by VUPD officers. The telephone number to call for a walking escort is either (615) 322-2745 (2-2745 from a campus phone) or (615) 421-8888 (1-8888 from a campus phone), after which, a representative from VUPD will be dispatched to the caller's location, or to a designated meeting point to accompany the caller to his or her destination.

Emergency Phones—Emergency telephones (Blue Light Phones) are located throughout the university campus, Medical Center, and 100 Oaks.

Each phone has an emergency button that when pressed automatically dials the VUPD Communications Center. An open line on any emergency phone will activate a priority response from an officer. An officer will be sent to check on the user of the phone, even if nothing is communicated to the dispatcher. Cooperation is essential to help us maintain the integrity of the emergency phone system. These phones should be used only for actual or perceived emergency situations.

An emergency response can also be activated by dialing 911 from any campus phone. Cellphone users can dial (615) 421-1911 to summon an emergency response on campus. Cellphone users should dial 911 for off-campus emergencies. Callers should be prepared to state the location from which they are calling.

Exchange Area—The Vanderbilt University Police Department has designated the lobby of the Police building located at 2800 Vanderbilt Place as an "Exchange Area." The Exchange Area is for Vanderbilt University students, faculty, and staff to trade legal items bought and sold online on various secondhand applications in a safe environment. The building/lobby is located next to the Vandy Van stop in lot 72C near Vanderbilt Stadium. Either the seller or buyer must be Vanderbilt affiliated (student, faculty, or staff). The affiliated person must complete the online registration form at police.vanderbilt.edu/safedeal prior to the actual trade.

Security Notices—In compliance with the U.S. Department of Higher Education and the Jeanne Clery Act, Security Notices are issued to provide timely warning information concerning a potentially dangerous situation on or near Vanderbilt University. This information is provided to empower our students and employees with the information necessary to make decisions or take appropriate actions concerning their own personal safety. Security Notices are distributed throughout Vanderbilt to make community members aware of significant crimes that occur at the university. They are distributed through Vanderbilt email lists and through the department's webpage, police.vanderbilt.edu/pdfs/annual-security-report.pdf.

Educational and Assistance Programs—The Crime Prevention Unit of Vanderbilt University Police Department offers programs addressing issues such as sexual assault, domestic violence, workplace violence, personal safety, RAD (Rape Aggression Defense) classes, and victim assistance. VUPD provides additional services including property registration (for bikes, laptops, etc.), lost and found, weapons safekeeping, and Submit a Crime Tip. For further information on available programs and services, call (615) 322-7846 or visit police.vanderbilt.edu/services.

Additional information on security measures and crime statistics for Vanderbilt is available from the Vanderbilt University Police Department, 111 28th Avenue South, Nashville, Tennessee 37212. Information is also available at police.vanderbilt.edu.

Annual Security Report—The *Vanderbilt University Annual Security Report* is published each year to provide you with information on security-related services offered by the university and campus crime statistics in compliance with the Jeanne Clery Disclosure of Campus Security Policy and Campus

Crime Statistics Act and the Tennessee College and University Security Information Act.

This booklet is prepared with information provided by the Nashville Metropolitan Police Department, the Department of Student Athletics, Office of the Dean of Students, the Office of Housing and Residential Experience, and the Vanderbilt University Police Department. It summarizes university programs, policies, and procedures designed to enhance personal safety for everyone at Vanderbilt.

A copy of this report may be obtained by writing or calling the Vanderbilt University Police Department, 111 28th Avenue South, Nashville, Tennessee 37212 or by telephone at (615) 875-9157. A PDF copy of this report may also be obtained on the website at police.vanderbilt.edu/crimeinfo/index.php.

Extracurricular Activities

Student Governance

Vanderbilt Student Government works in partnership with faculty and administration to represent student interests, concerns, and aspirations. In addition, the organization advocates for students, sponsors organization activities, and coordinates opportunities for student involvement and interaction with faculty. Student interests are addressed through the three branches of the organization: executive, legislative, and judicial. The executive branch includes the Executive Board and Cabinet, as well as ad hoc and standing committees. The legislative branch, known as the Senate, is made up of elected student officials representing the four undergraduate schools and the residential areas. The judicial branch enforces rules set forth in VSG-governing documents. Students are encouraged to become involved with VSG in either appointed or elected positions. To learn more about VSG, their branches, and initiatives, visit their website at studentorg.vanderbilt.edu/vsg.

Active Citizenship and Service

Active citizenship and service are vital components of the student experience at Vanderbilt. The Office of Active Citizenship and Service aims to expose students to a wide variety of perspectives and experiences aimed at educating the whole person while cultivating lifelong learning. By creating applied community service programs that give students the opportunity to engage, to question, and to create change locally and globally, OACS helps students achieve personal growth through meaningful, collaborative action. OACS supports, encourages, and advises Vanderbilt students and nearly seventy student organizations to become involved in a wide array of active citizenship and service opportunities. These service opportunities explore topics such as health care, education, social enterprise, and community development.

OACS programming includes active community engagement in Nashville through a variety of service initiatives, including the 9/11 and Martin Luther King Jr. Weekends of Service. The office coordinates global service-learning programs around the world, as well as assisting student organizations with a variety of service learning programs, both domestic and international.

OACS empowers students not only to build relationships with other students and partners in the greater Nashville community, but also challenges students to seek new information

and to critically analyze the nuanced concepts of service and advocacy. The OACS motto, *Explore. Act. Reflect.*, celebrates Vanderbilt's mission of creative engagement, open inquiry, equity, and compassion.

Student Centers

A variety of facilities, programs, and activities are provided in six separate student center locations—Alumni Hall, The Commons Center, E. Bronson Ingram College, Kissam Center, Sarratt Student Center|Rand Hall, and the Student Life Center.

Sarratt Student Center|Rand Hall is the main student center hub, housing a 300-seat cinema, art gallery, art studios, multicultural space, rehearsal rooms, large lounge spaces, large and small meeting spaces, and a courtyard. The facility is also home to Vanderbilt Student Communications, radio station, TV station, Local Java, and the Pub at Overcup Oak restaurant. Rand Hall houses the Rand Dining Center, campus store, a multipurpose venue, meeting and seminar rooms, plus large, open lounge space. Some of the offices located in Sarratt Student Center|Rand Hall include the Dean of Students, Greek Life, Student Leadership, Arts and Campus Events, Student Organizations and Governance, Student Care Coordination, Student Accountability, Community Standards and Academic Integrity, and the Student Center for Social Justice and Identity. Also included in this facility is a United States Postal Service office.

The Vanderbilt Student Life Center is the university's large event space. It is both the fulfillment of students' vision to have a large social space on campus and a wonderful complement to Sarratt Student Center|Rand Hall. The Student Life Center has more than 18,000 square feet of event and meeting space, including the 9,000-square-foot Commodore Ballroom, which is one of the most popular spaces to have events on campus. The center is also home to the Career Center, Global Education Office, Office of Immersion Resources, and Office of Active Citizenship and Service.

The Commons Center is the community crossroads of The Ingram Commons living and learning community. It has it all: the Dining Hall and great food; a living room with a concert-grade grand piano, and the occasional live musical performance; a small rec room with cardio equipment, free weights, and weight machines; meeting and study rooms; and academic support services like the Writing Studio, the Career Center, and the CASPAR premajor advising center. The third floor of The Commons Center is the home of the Department of Political Science.

Alumni Hall was the original student center on campus when the building opened in 1925. Re-opened in fall 2013 after a yearlong renovation that transformed every space in the facility, Alumni Hall has returned to its role as a student center after serving other purposes over the years. In the renovated Alumni Hall, students have access to an exercise room as well as several new meeting and event spaces. The Vanderbilt Graduate School calls Alumni Hall home, and lounge space on the first floor serves as a robust hub for student life within the Graduate School community.

Opened in fall 2014 and fall 2018, respectively, Kissam Center and E. Bronson Ingram College are both part of the Vanderbilt residential college system. Kissam Center is home to meeting and event spaces, the Kissam Market, and Kissam Kitchen. E. Bronson Ingram College offers a dining facility, including the award-winning Bamboo Bistro pho concept.

Vanderbilt Student Communications, Inc.

VSC has jurisdiction over campus radio stations, Vanderbilt Television, and undergraduate publications that are supported by the student service fees. VSC functions chiefly to hire student leaders, supervise and audit financial records, maintain professional standards, and develop communications opportunities for students.

Among the divisions of the corporation are *The Vanderbilt Hustler*, the campus newspaper; the *Commodore* yearbook; radio stations WRVU and VandyRadio; Vanderbilt Television; *The Vanderbilt Review*, an annual literary/arts publication; *The Slant*, a humor/satire publication; My Commons Life, a website for first-year students; My Vanderbilt Life, a website for all students; *Vanderbilt Political Review*; *Vanderbilt Historical Review*; and *Global VU*, an international issues journal.

Recreation and Sports

More than two-thirds of Vanderbilt University students participate in club sports, intramurals, group fitness classes, or other programs offered at the David Williams II Student Recreation and Wellness Center, known by students as “the Rec.” The large variety of programs available for meeting students’ diverse interests include: more than thirty club sports teams; more than thirty intramural sports (softball, flag football, basketball, table tennis, and soccer); and an aquatics program offering swim lessons for all ages and abilities. Red Cross lifeguarding and CPR classes are also available. If being outside is more your style, you can choose from one of the many adventure trips offered each semester or create your own adventure trip with tips and gear from the Outdoor Recreation staff. There are more than sixty group fitness classes a week and a variety of wellness offerings from “learn to box” to healthy eating through Vandy Cooks in the Teaching Kitchen, Personalized Nutrition Coaching, and Nutrition Minute grab-and-go information on a variety of nutrition topics.

The Rec is a 289,000-square-foot facility that houses a 25-yard, 15-lane swimming pool; four courts for basketball, volleyball, and badminton; five racquetball and two squash courts; a four-lane bowling alley; five group fitness classrooms, more than 14,000 square feet of weight/fitness room space; rock-climbing wall; seven multipurpose rooms; locker rooms; and a 120-yard turf field surrounded by a 300-meter track in the indoor field house. The Rec’s exterior spaces include more than seven acres of field space including three natural grass fields and one turf field.

All students pay a mandatory fee which supports the facilities, fields, and programs (see the chapter on Financial Information). Spouses must also pay a fee to use the facilities.

For additional information, please visit vanderbilt.edu/recreationandwellnesscenter.

Varsity Athletics

Students interested in more highly competitive sports on the varsity level will find challenges in intercollegiate athletics sanctioned by the Southeastern Conference, the Big East Conference, Southland Conference, and the NCAA. Women’s teams compete in basketball, bowling, cross country, golf, lacrosse, soccer, swimming, tennis, and indoor and outdoor track and field. Men’s teams compete in baseball, basketball, cross country, football, golf, and tennis. Women’s lacrosse is in the Big East Conference. Women’s bowling is in the Southland Conference. All other sports are in the Southeastern Conference.

Cultural Activities on the Campus

Working through volunteer student committees that plan and execute the programs, the Office of the Dean of Students sponsors twelve to fifteen dance, music, and theater events each year, featuring renowned artists. Student committees select the artists and handle all arrangements for the performances.

Vanderbilt’s cultural organizations annually produce festivals that showcase traditional and modern dances, art, music, and poetry to increase awareness of the many cultures represented on campus. The events include Lunar New Year Festival by the Asian American Student Association, Diwali by Masala-SACE, and Café Con Leche by the Association of Latin American Students, to name just a few.

The Office of Arts and Campus Events coordinates numerous campus galleries that regularly exhibit contemporary artwork. Located directly across from Sarratt Cinema, the Sarratt Gallery creates unique and intriguing exhibits that offer visitors a quiet space to enjoy and reflect on the work of talented artists. Exhibits often support the classes taught by Sarratt Art Studios while offering unique ideas and approaches to traditional mediums. The gallery is free and open to the public and is open seven days a week during school semesters and on weekdays in the summer. Works from the university collection as well as special curated exhibits are on display in the gallery at the Bishop Joseph Johnson Black Cultural Center and the Fine Arts Gallery in Cohen Memorial Hall.

Vanderbilt University Theatre annually presents four major productions and several one-act plays for which all students are invited to audition. Other campus groups and touring companies also give dramatic presentations during the year.

Vanderbilt has several student organizations that focus on dance performance. Examples of these groups include the hip hop group Vibe, Momentum contemporary dance group, and Vida which focuses on Latin styles of dance. Dance, theater, and vocal groups present a showcase, *Spotlight*, every fall to encourage interested students to audition to be considered members for the year.

Sarratt Art Studios offers noncredit studio art classes in clay, photography, jewelry, book arts, graphic design, watercolor and more. Located on the main floor of Sarratt Student Center, classes meet one night a week for ten weeks during fall, spring, and summer semesters. A schedule of classes and more information can be found at www.vanderbilt.edu/sarrattart. Tuition and material fees are affordable and classes are taught by some of Nashville’s finest studio artists. Sarratt Art Studios also hosts the Annual Sarratt Holiday Arts Festival in the Sarratt Gallery which features affordable handmade gift items from local artisans and vendors in the Nashville area.

The Vanderbilt performing arts community represents more than thirty student groups devoted to providing opportunities for performers to showcase their talents. Student organizations that schedule annual performances range from comedy groups to dance organizations, to the musical theater of Vanderbilt Off-Broadway. Campus concerts are presented each year by the Concert Choir and Chamber Singers; Chamber Choir, Symphonic Choir, and Opera Theatre; Vanderbilt Orchestra and Chamber Orchestra; the Wind Ensemble and Jazz Band; and numerous student a cappella groups.

Outstanding scholars and speakers visit the university frequently, enriching the academic and cultural life of the campus in many ways. Various academic departments sponsor regular speaker programs, as do the student-initiated Impact

Symposium, the Speakers Committee, and the Gertrude Vanderbilt and Harold S. Vanderbilt Visiting Writers program.

Student Center for Social Justice and Identity

The Student Center for Social Justice and Identity within the Dean of Students office conducts events, activities, and training that both celebrate diversity and serve to educate Vanderbilt students on pertinent issues of culture, social justice, identity, and advocacy. SJAI supports students of varying backgrounds, nationalities, and identities through wide-ranging programming which serves to foster a sense of belonging, to commemorate important cultural values, and to facilitate understanding between people of differing backgrounds and orientations. Additionally, Dean of Students staff members in SJAI serve a number of student organizations as advisers, meeting with student leaders on a regular basis, attending their organizations' events, and serving as mentors. The center is located in Sarratt 335, across from Vanderbilt's Pub at Overcup Oak. For more information, visit vanderbilt.edu/social-justice-and-identity.

Office of Student Leadership Development

The Office of Student Leadership Development is designed to serve as a conduit for leadership programming and a resource hub for students, faculty, and staff. The office believes in developing visionary, goal driven, and action oriented student leaders. Students who participate in leadership programs will be accountable to others, collaborative and team oriented, effective communicators, and service-oriented; practice moral decision making; and embrace diversity and inclusion.

The office sponsors signature leadership programs during the year, but also works closely with all areas within the Dean of Students office to ensure leadership programming occurs across all aspects of campus life. Programs emerging from this office will provide students with multiple points of entry and easy access to develop and enhance their leadership skills.

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Undergraduate School Catalog

Admission

THE admissions process for first-year applicants to Vanderbilt is holistic in nature and based on students' academic records and personal accomplishments. All available information is considered, including secondary school academic record, evidence of academic maturity and independence, extracurricular activities, contributions to the school and community, scores on standardized tests, and letters of recommendation.

The admissions process is designed to select a diverse student body with high standards of scholarship, personal character, and serious educational aims. Policies that govern the selection process have been set by the vice provost for university enrollment affairs. Please refer to the nondiscrimination statement which appears earlier in this catalog.

Admission to the four undergraduate schools is managed by the Office of Undergraduate Admissions. Prospective students are encouraged to investigate the university by visiting the campus, exploring the Office of Undergraduate Admissions website, connecting via social media, and attending college fairs and other programs hosted by Vanderbilt admissions officers across the country and around the world. Admissions staff are available to answer questions, arrange campus tours, provide additional information about degree programs, and link visitors with appropriate campus offices and members of the university community.

Academic Preparation

All candidates for admission must present transcripts of work completed in high school. While our admissions process is holistic, most successful candidates will present a curriculum that includes the equivalent of five academic subjects each year for four years. Recommended course work includes 4 units of English, 4 units of mathematics, 4 units of natural science, 2 units of foreign language, 2 units of social science/humanities, and 4 units of additional course work in these areas, or other academic courses such as engineering science, computer science, social science or natural science research, or advanced work in the humanities. Close attention will be paid to the rigor of course work presented. It is highly recommended that candidates applying to the School of Engineering have taken calculus and calculus-based physics.

Most successful candidates will have meaningfully engaged with the academic, intellectual, social, and leadership opportunities available in the context of their high schools and communities. In exceptionally rare cases, students may be considered for admission before completing four years of high school. In these cases, the Admissions Committee considers especially evidence of maturity and readiness for an immersive, residential college experience.

Application Procedure — First-year Applicants

1. Applicants must apply online to Vanderbilt through the Coalition Application, the Common Application, or Quest-Bridge. Applications for admission may be accessed online at admissions.vanderbilt.edu/apply. Interested students should visit vanderbilt.edu/scholarships for more information.
2. Applicants must arrange for their high school to submit an official transcript to the Office of Undergraduate Admissions via one of the application portals.
3. Applicants are responsible for having their official scores from the SAT and/or the ACT sent to Vanderbilt by the testing agency. Score reports appearing on official high school transcripts are accepted as official.
4. A \$50 application fee is required and is not refundable. Application fee waivers are available through a variety of sources.
5. On the application for admission, select the decision plan for which you wish to be considered: Early Decision I, Early Decision II, or Regular Decision.
 - Early Decision plans are designed for students whose first-choice college is Vanderbilt. These plans are binding: if offered admission, students agree to attend Vanderbilt and to withdraw all other applications for admission. In addition to the other application requirements, the Early Decision Agreement must be submitted. Signatures are required from the applicant, the applicant's parent/guardian, and the high school counselor. It is Vanderbilt's practice to admit or deny Early Decision applicants; in rare cases, applicants may be deferred to the Regular Decision pool.
 - The Regular Decision plan is designed for students who are considering many college options and who wish to compare offers of admission and financial aid before committing to one college. Applicants will be admitted, denied, or offered a spot on the waitlist. Waitlisted students may be offered admission later in the spring.
 - Deadlines:
 - Early Decision I — submit application by November 1
 - Early Decision II — submit application by January 1
 - Regular Decision — submit application by January 1
6. Blair School of Music applicants are required to follow the audition protocol detailed on the Blair website (blair.vanderbilt.edu/admissions/apply.php). Selected applicants will be invited to audition in person on campus.

Application Procedure — Transfer Applicants

Admission of transfer students to Vanderbilt is competitive and holistic. The priority deadline to submit the transfer application is March 15. It is Vanderbilt's practice to offer transfer admission only for the fall semester.

1. Transfer applicants must apply online through the Coalition Application Transfer Application or the Common Application Transfer Application.
2. Submit official test results from either the SAT and/or the ACT.
3. Provide a Transfer College Report and be in good academic and social standing at the institution last attended.
4. Provide an official secondary school transcript.
5. Provide official transcripts from each college attended.
6. Submit two academic letters of recommendation.

7. Agree to attend a Vanderbilt undergraduate program for at least four semesters (60-plus hours) of full-time work (63-plus hours for Blair School of Music students). Two of these semesters (30-plus hours) must be within the senior year.
8. Blair School of Music applicants are required to follow the audition protocol detailed on the Blair website (blair.vanderbilt.edu/admissions/apply.php). Selected applicants will be invited to audition in person on campus.

International Applicants

For the purpose of admission, the term “international applicants” refers to students who are not citizens of the United States or who are not eligible non-citizens. International applicants must complete all admission requirements of the university. (See “Application Procedure” above, for first-year and for transfer applicants.)

Applicants whose first language or language of instruction is not English are required to submit the results of the Test of English as a Foreign Language (TOEFL), the International English Language Testing Service (IELTS), or the Pearson Test of English Academic (PTE Academic). This testing requirement may be waived if a student has scored above a 33 on the SAT Reading Test, or above a 26 on the ACT English section. Minimum recommended scores for Vanderbilt are 100 on the internet-based TOEFL, 230 on the computer-based TOEFL, 7.0 on the IELTS, and 70 on the PTE Academic.

Advanced Credit

Honors courses and other accelerated study in high school are excellent preparation for Vanderbilt. The well-established advanced-placement policy endeavors to recognize exceptional high school preparation, to avoid requiring first-year students to take courses clearly mastered in high school, and to encourage students to begin their college learning experience at the level most appropriate to their preparation. Advanced placement may be granted on the basis of good performance on the College Board Advanced Placement Examinations, on International Baccalaureate tests, or, in some cases, on placement tests given by Vanderbilt. Credit may also be awarded for the British G.C.E. “A” level examinations, the Advanced International Certificate of Education

(AICE), the Cambridge Pre-U diploma, and similar tests, such as the French *baccalauréat*, the German *abitur*, or the Swiss *maturité* examinations. To qualify for credit for the AICE examinations or individual A-level examinations, students must have achieved an *A**, *A*, or *B* thereon. More information on international exam credit is available at registrar.vanderbilt.edu/international-examinations.

Advanced Placement Credit Policy

Advanced Placement Examination grades accepted for advanced placement with credit by the various departments at Vanderbilt are listed below. At the determination of individual departments, Advanced Placement Examination grades with a score of 4 or 5 may be accepted for credit. The amount of credit that may be awarded corresponds to the course work waived. Advanced Placement credit does not affect the Vanderbilt grade point average.

Students of the College of Arts and Science are limited to a total of 18 credit hours earned by any combination of advanced placement, international baccalaureate credit, advanced international credit, and credit by departmental examination, counting toward the minimum number of hours required toward the degree. For students in the College of Arts and Science, no form of advanced placement credit can be used to fulfill the Achieving Excellence in Liberal Education (AXLE) requirements.

International Baccalaureate Credit Policy

International Baccalaureate test scores accepted for advanced credit by the various departments at Vanderbilt are listed below. Students who have taken tests in other areas may submit their scores to the Office of Academic Services for evaluation by the appropriate departments. Credits are awarded for exams taken at the higher level only. The amount of credit that may be awarded is subject to the same limitations as credit for Advanced Placement.

Advanced Placement Examination Grades Accepted by Various Departments at Vanderbilt for Advanced Placement with Credit

AP Exam	AP Score	Vanderbilt Course or Credit Equivalent	Credit Hours
Art			
Art History	4 or 5	HART 1110: History of Western Art I HART 1105: History of Western Art II	3 3
Studio Art: 2-D Design	4 or 5	ARTS No Equivalent: Art Studio	3
Studio Art: 3-D Design	4 or 5	ARTS No Equivalent: Art Studio	3
Studio Art: Drawing	4 or 5	ARTS No Equivalent: Art Studio	3
Computer Science			
Computer Science A	5	CS 1101: Programming & Problem Solving	3
Economics			
Macroeconomics	4 or 5	ECON 1010: Principles of Macroeconomics	3
Microeconomics	4 or 5	ECON 1020: Principles of Microeconomics	3
English			
English Language & Composition	4 or 5	ENGL 1300W: Intermediate Composition	3
English Literature & Composition	4 or 5	ENGL 1220W: Drama: Forms and Techniques ENGL 1230W: Literature and Analytical Thinking	3 3
Government and Politics			
Government & Politics: Comparative	4 or 5	PSCI 1101: Introduction to Comparative Politics	3
Government & Politics: United States	4 or 5	PSCI 1100: Introduction to American Government and Politics	3
History			
European History	4 or 5	HIST No Equivalent: European History	3
United States History	4 or 5	HIST No Equivalent: U.S. History	3
World History	4 or 5	HIST No Equivalent: World History	3
Human Geography	No Credit		
Languages			
Chinese Language and Culture	4	CHIN 2201: Intermediate Chinese I	5
Chinese Language and Culture	5	CHIN 2202: Intermediate Chinese II	5
French Language	4 or 5	FREN 2203: Contemporary Francophone Cultures FREN 2501W: French Composition and Grammar	3 3
French Literature	4 or 5	FREN 2203: Contemporary Francophone Cultures FREN No Equivalent: French Literature	3 3
German Language	4 or 5	GER 2201: Intermediate German I GER 2202: Intermediate German II	3 3
Italian Language and Culture	4 or 5	ITA 2203: Italian Journeys ITA 2501W: Grammar and Composition	3 3
Japanese Language & Culture	4	JAPN 2201: Intermediate Japanese I	5
Japanese Language & Culture	5	JAPN 2202: Intermediate Japanese II	5
Latin	4 or 5	LAT 2202: Intermediate Latin: Poetry	3
Spanish Language or Literature	4	SPAN 2203: Intermediate Spanish	5
Spanish Language or Literature	5	SPAN 2203: Intermediate Spanish SPAN 3302: Spanish for Oral Communication through Cultural Topics	5 3
Mathematics			
Calculus AB	5	MATH 1300: Accelerated Single-Variable Calculus I	4
Calculus BC & AB Subscore	3 & 5	MATH 1300: Accelerated Single-Variable Calculus I	4
Calculus BC & AB Subscore	4 & 5	MATH 1300: Accelerated Single-Variable Calculus I	4
Calculus BC	5	MATH 1300: Accelerated Single-Variable Calculus I MATH 1301: Accelerated Single-Variable Calculus II	4 4
Music			
Music Theory	5	MUTH 1200: Survey of Music Theory	3
No course credit awarded for music majors			
Psychology			
Psychology	5	PSY 1200: General Psychology	3

Sciences

Biology	4 or 5	BSCI 1100: Biology Today	3
		BSCI 1100L: Biology Today Laboratory	1
Chemistry	5	CHEM 1601: General Chemistry	3
		CHEM 1601L: General Chemistry Laboratory	1
		CHEM 1602: General Chemistry	3
		CHEM 1602L: General Chemistry Laboratory	1
Environmental Science		No Credit	
Physics 1	5	PHYS 1010: Introductory Physics	3
		PHYS 1010L: Introductory Physics Lab	1
None of the credits awarded for Physics 1 shall count toward the major or the minor in physics. No credit awarded for engineering students.			
Physics 2	5	PHYS No Equivalent	4
None of the credits awarded for Physics 2 shall count toward the major or the minor in physics. No credit awarded for engineering students.			
Physics B	5	PHYS 1010: Introductory Physics	3
		PHYS 1010L: Introductory Physics Laboratory	1
No credit awarded for engineering students; not to be awarded if student also has credit for Phys 1601/1601L or Phys 1602/1602L			
Physics C: Electricity & Magnetism	5	PHYS 1602: General Physics II	3
		PHYS 1602L: General Physics Laboratory II	1
Physics C: Mechanics	5	PHYS 1601: General Physics I	3
		PHYS 1601L: General Physics Laboratory I	1
Statistics			
Statistics	4 or 5	MATH 1010: Probability and Statistical Inference	3
No credit awarded for engineering students			

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International Baccalaureate Test Scores Accepted by Various Departments at Vanderbilt for Advanced Credit

IB Certificate Subject	IB Score	Vanderbilt Course or Credit Equivalent	Credit Hours
Biology (Higher)	6 or 7	BSCI 1100: Biology Today	3
		BSCI 1100L: Biology Today Laboratory	1
Chemistry (Higher)	6 or 7	CHEM 1601: General Chemistry	3
		CHEM 1601L: General Chemistry Laboratory	1
		CHEM 1602: General Chemistry	3
		CHEM 1602L: General Chemistry Laboratory	1
Economics (Higher)	6 or 7	ECON 1010: Principles of Macroeconomics	3
		ECON 1020: Principles of Microeconomics	3
English (Higher)	6 or 7	ENGL 1220W: Drama: Forms and Techniques	3
		ENGL 1230W: Literature and Analytical Thinking	3
French (Higher)	6 or 7	FREN 2203: Contemporary Francophone Cultures	3
		FREN No Equivalent: Elective Credit	3
History (Higher)	6 or 7	HIST No Equivalent: History Elective	3
Japanese (Higher)	6 or 7	JAPN 3301: Advanced Japanese I	3
		JAPN 3302: Advanced Japanese II	3
Latin (Higher)	6 or 7	LAT 2201: Intermediate Latin: Prose	3
		LAT 2202: Intermediate Latin: Poetry	3
Mathematics (Higher)	6 or 7	MATH 1010: Probability and Statistical Inference	3
		MATH 1300: Accelerated Single Variable Calculus I	4
		MATH No Equivalent: Math elective credit	1
		No credit for Math 1010 for engineering students.	
Music (Higher)	6 or 7	MUSL No Equivalent (may count toward a music major)	3
Physics (Higher)	7	PHYS 1601: General Physics I	3
		PHYS 1601L: General Physics Laboratory I	1
		PHYS 1602: General Physics II	3
		PHYS 1602L: General Physics Laboratory II	1
Psychology (Higher)	6 or 7	PSY 1200: General Psychology	3
Russian (Higher)	6 or 7	RUSS 2201: Second-Year Russian	3
		RUSS 2202: Second-Year Russian	3
Spanish (Higher)	6 or 7	SPAN 2203: Intermediate Spanish	5
		SPAN 3302: Spanish for Oral Communication through Cultural Topics	3
Visual Arts (Higher)	6 or 7	ARTS No Equivalent: Visual Arts	3
		ARTS No Equivalent: Visual Arts	3

Pre-College Summer School Program

Upon completion of the sophomore or junior year in high school, students may enroll, at the freshman level, for regular work in the Vanderbilt summer session.

The following conditions must be met: (a) students must be in the upper 25 percent of their high school class and be recommended by their principal or counselor; (b) courses taken in the Vanderbilt summer session must be chosen by the student in consultation with his or her high school counselor and the director of the Division of Unclassified Studies so as to supplement and not overlap the total high school program. A student may take two courses in any one summer, or three courses by special authorization of the director of the Division of Unclassified Studies.

Course work done at Vanderbilt by a pre-college student may count toward the high school diploma and as part of the entrance requirements for regular admission to Vanderbilt. All course work done at Vanderbilt by pre-college students will be credited toward the degree for those who may subsequently matriculate at Vanderbilt, unless the course work is required for high school graduation. Admission to the pre-college summer school program does not admit a student as a regular entering freshman, nor does it commit the university to a student's admission.

Credit for Previous College Work

Entering first-year students who have taken college work in high school through dual enrollment or concurrent enrollment programs, or during summers prior to their offer of admission to Vanderbilt, must report such work to the Office of Undergraduate Admissions if they wish it to be reviewed for credit. At the student's request, the dean of the appropriate undergraduate school will determine whether such work may be credited toward the Vanderbilt degree.

Applications for pre-freshman credit must be submitted by the first day of classes in the freshman year.

Credit will be awarded only if:

1. A course is regularly offered by an accredited two-year or four-year college or university. For domestic schools, the school must be regionally accredited; for international schools, the school must have country-specific accreditation.
2. The teacher was a regular faculty member of that college or university.
3. A majority of the students in the course were candidates for a degree at that college or university.

Additional requirements and guidelines regarding pre-freshman credit are available at registrar.vanderbilt.edu/transfer-credit.php.

The College of Arts and Science and Peabody College usually do not award credit for work at other colleges in the summer immediately preceding the student's first semester at Vanderbilt. Summer work elsewhere will be accepted for credit only if an unusual educational opportunity can be demonstrated and if the courses sought are as rigorous as courses offered at Vanderbilt. Approval for work to be taken elsewhere must be obtained in advance from the appropriate dean.

College of Arts and Science. In no case may credits completed elsewhere after the student has been offered admission by the College of Arts and Science satisfy AXLE requirements.

International Students

Vanderbilt has a large international community representing more than 95 countries. The university welcomes the diversity international students bring to the campus and encourages academic and social interactions at all levels.

Admission. See International Applicants section earlier in this chapter.

English Language Instruction. Students wishing to focus on improving their English language use for the context of the U.S. academic setting may take classes and participate in programming at the Vanderbilt English Language Center to support their academic success. The ELC's courses include *writeELC*, Academic Speaking, and Pronunciation. Throughout the academic year, academic workshops and one-to-one consultations for speaking and writing are also available through the ELC. Entering students may be required to take language support courses concurrently with their academic courses at the ELC. The ELC is located at 1208 18th Avenue South. For information about the ELC's programming, see the "English Language Center" section in the Life at Vanderbilt chapter of this catalog or visit vanderbilt.edu/elc.

Financial Resources. To meet requirements for entry into the United States for study, applicants must demonstrate that they have sufficient financial resources to meet the expected costs of their educational program. Applicants must provide documentary evidence of their financial resources before visa documents can be issued.

United States laws and regulations restrict the opportunity for international students to be employed. Undergraduate international students are allowed to work on campus for nineteen hours per week while school is in session. Students may be allowed to work off campus only under special circumstances. Many spouses and dependents of international students are not allowed to be employed while in the United States.

Limited need-based financial aid is available to students who are neither citizens nor permanent residents of the United States, and are considered to be international students in Vanderbilt's admissions process. Our admissions process is need-aware for international students; international students who demonstrate that they can afford the cost of attending Vanderbilt will be given preferential treatment. To apply for need-based financial aid, international students are required to submit the College Scholarship Service (CSS) Financial Aid Profile. Based upon an evaluation of academic qualities, financial need, and availability of resources, an international student may be considered for need-based financial assistance. International students who apply for need-based financial aid will be admitted only if they are competitive in our holistic review and if Vanderbilt is able to provide adequate financial assistance.

International Student Health Insurance. International students are required to have health insurance throughout their academic program and are automatically enrolled in the Vanderbilt University-approved International Student Injury and Sickness Insurance Plan through Gallagher. For information concerning the limits, exclusions, and benefits of this insurance coverage, please contact the Student Health Center.

Transfer Credit

Work presented for transfer must be from an accredited college and is subject to evaluation in light of the degree requirements of this university. For domestic schools, the school must be regionally accredited; for international schools, the school must have country-specific accreditation.

Work transferred to Vanderbilt from another institution will not carry with it a grade point average. No course in which a grade below C- was received will be credited toward a degree offered by the university.

College of Arts and Science. Transfer students must complete at least 60 hours of work in the College of Arts and Science. Credit earned as a degree-seeking student at another university may be used to fulfill AXLE requirements.

Blair School of Music. In addition to an application for admission, transfer students applying to Blair must also submit a Blair School of Music Application, which includes a required prescreening video, by the March 15 deadline. Selected applicants will be invited to audition in person. See the Blair website for information and instructions about the Blair admissions process. Transfer students will be assigned a level of program study based on the entrance audition. Credit for music courses may be granted following an examination at Blair. Credit for non-music courses is subject to evaluation by the university. Transfer students must complete at least 63 hours at Blair.

School of Engineering. Transfer students must complete at least 60 hours of work at Vanderbilt.

Peabody College. Transfer students must complete at least 60 hours of work at Peabody. Two of the four semesters in residence must be the last two semesters of the student's degree program.

Prior Degrees

It is the policy of Vanderbilt University to verify prior educational credentials for all admitted students who intend to matriculate. All matriculated students must provide official copies of transcripts and any other required supporting documentation to Vanderbilt University as part of the prior degree verification process. The Office of the University Registrar will review transcripts and other supporting documentation for authenticity and to confirm degrees earned prior to matriculation at Vanderbilt. Offers of admission are contingent on a student's providing the required documentation. Students who are not able to provide evidence of prior degrees will not be permitted to register for subsequent terms and may be subject to dismissal from the university.

Intra-University Transfer

Undergraduate students in the College of Arts and Science, Blair School of Music, School of Engineering, and Peabody College may request a transfer between the schools. Students are eligible for intra-university transfer after having been enrolled on a full-time basis at Vanderbilt for two semesters. Students who transferred to Vanderbilt from another institution are eligible for intra-university transfer after having completed at least one full semester at Vanderbilt and having achieved sophomore standing. To be eligible for transfer, students must meet the requirements of the school they wish to enter.

Applications are available on the Office of the University Registrar website, registrar.vanderbilt.edu/intra-university-transfers/, and should be submitted to the Office of the University Registrar by the required deadlines listed on this webpage.

Students seeking transfer between schools within the university must meet the following requirements: (a) a student who has been in residence for two regular semesters must have a minimum of 24 hours and a cumulative grade point average of 1.800; (b) a student who has been in residence for three regular semesters must have a minimum of 39 hours and a cumulative grade point average of 1.850; (c) a student who has been in residence for four regular semesters must have a minimum of 54 hours and a cumulative grade point average of 1.900; (d) a student who has been in residence for five regular semesters must have a minimum of 69 hours and a cumulative grade point average of 1.950.

Individual schools and/or majors may impose additional restrictions beyond the minimum requirements listed above. Students applying to the Blair School of Music must audition as part of the process. Transfer applicants to the School of Engineering should present at least two semesters of college calculus and two semesters of laboratory-based science as required in the intended major. Advanced Placement or International Baccalaureate credit, if accepted by Vanderbilt, can be used to meet these requirements.

Division of Unclassified Studies

The Division of Unclassified Studies provides an opportunity to take undergraduate courses at Vanderbilt as follows: (a) adults not interested in working toward a degree, (b) visiting students working toward a degree at another institution (students in this category may not remain enrolled in the division for more than two regular semesters and one summer session), and (c) rising junior and senior students in high school who have received special permission to enroll in courses for college credit.

Such students register in the Division of Unclassified Studies. Records are kept of their work, and a transcript may be made available to them as it would be if they were regularly enrolled at Vanderbilt. Work taken in the division may be transferred to a degree-granting unit of the university provided it is work that will count as part of the program of that unit. Work so transferred may not amount to more than one-fourth of the requirements for the Vanderbilt degree. Requests for transfer to a Vanderbilt degree-granting school must be made to the Office of Undergraduate Admissions. Division of Unclassified Studies students are not eligible for intra-university transfer.

Students who want to enroll in the Division of Unclassified Studies must apply and be admitted to the division at least one week before the first day of classes for the term or session they wish to attend. Requests for exceptions to the admission criteria must be addressed in writing to the vice provost for university enrollment affairs and dean of admissions and financial aid, whose decision is final.

All university regulations, including the Honor System, apply to students registered in the Division of Unclassified Studies.

Degree candidates have priority in enrollment at Vanderbilt, and students registering in the Division of Unclassified Studies should be prepared for this contingency. DUS students must meet all course prerequisites. Permission of the Office of the Dean is required for enrollment in some courses. Tuition is charged at the standard rate.

Division of Unclassified Studies students are not charged health insurance fees, and do not have access to student health services. Those enrolled in the division as full-time students (particularly visiting students or others living in campus residence halls) may petition to add the insurance.

Summer Session

The ten-week summer session begins in early June and ends early in August. In addition, some units of the university offer an accelerated four-week Maymester. Vanderbilt offers the summer program for regularly enrolled students at the university, for part-time students, and for students enrolled during the regular year in other colleges and universities (visiting students).

Summer courses are normally offered by the College of Arts and Science, Blair School of Music, the School of Engineering, the Graduate School, the School of Nursing, and Peabody College.

Some courses extend over the entire summer session and complete the work of a full semester. Others are offered in modular units of eight, six, five, or four weeks, for full semester credit. Still other summer courses complete a full semester's work in the first five-week or second five-week half of summer session, with classes meeting twice as many hours per week. In full-year courses offered in summer, the work of the first semester is covered in the first half-session, the work of the second semester in the second half.

Classrooms, residence halls, libraries, and dining halls are air conditioned. The David Williams II Student Recreation and Wellness Center and other athletic facilities are open in the summer. Information about the summer session is available on request from the Division of Unclassified Studies or from each school's Office of Academic Services. Students may also go to vanderbilt.edu/summer for additional information.

Maymester

In the interval of several weeks between final examinations in the spring semester and the beginning of summer session, Vanderbilt offers educational travel opportunities and a variety of "total immersion" courses that would be difficult to offer during a regular semester.

Students are permitted to take no more than one course during the Maymester. Housing and food services are available during the session. Visiting students are eligible for Maymester courses.

Information about May courses on campus or abroad can be found at vanderbilt.edu/summer.

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Financial Information

TUITION for undergraduates for the 2019/2020 academic year is \$50,800 (\$25,400 a semester). An equipment fee of \$950 is charged for students enrolled in the School of Engineering (in addition, freshmen entering the School of Engineering are required to own a laptop computer, with an estimated cost of \$1,500). Freshman music majors in the Blair School of Music are charged a one-time technology equipment fee of \$490. A full-time undergraduate student takes 12 to 18 hours. Students taking more than 18 hours per semester are charged \$2,117 per hour for each extra hour. Students who, for approved reasons, enroll for fewer than 12 hours are charged \$2,117 per hour, with a minimum tuition charge of \$2,117 per semester. The \$400 deposited with the Office of Undergraduate Admissions when the student is accepted is applied to the bill for the first semester.

Rates for tuition and fees are set annually by the Board of Trust and are subject to review and change without further notice.

Estimate of Expenses

Basic expenses (excluding travel and personal expenses) should be approximately \$72,624 a year, itemized as follows:

Tuition (2019/2020)	\$50,800
Room and board (estimate)	16,910
Books and supplies (estimate)	1,294
Student service fees (estimate)	1,270
Student health insurance	2,350

Other Academic Fees

Application fee	\$50
First-Year Experience fee (year)	836
Engineering equipment fee (year)	950
Blair technology equipment fee (one-time fee for freshman music majors)	490
Late registration fee	30
Senior-in-absentia minimum semester tuition charge (hourly rate)	2,117
Special examination fee	5
Credit by departmental examination fee	50
Transcript fee (one time only)	100

Self-service registration concludes on the sixth day of the term.

Students who have not registered by the published dates may be subject to late registration fees. Registration dates are published in the Academic Calendars.

Payment of Tuition and Fees

Tuition, fees, and all other university charges incurred prior to or at registration are due and payment must be received by August 31 for the fall semester and January 2 for the spring semester. If courses are added AFTER the initial billing period, it is the student's responsibility to contact the Office of Student Accounts for due dates and amounts related to tuition in order to avoid any holds and/or late payment penalties. All other charges incurred after classes begin are due and payment must be received in full by the last business day of the month in which they are billed to the student. If payment is not made

within that time, Commodore Cash may not be available and your classes may be canceled. Visit vanderbilt.edu/stuaccts for payment options.

Students/Guarantors will be responsible for payment of all costs, including reasonable attorney fees and collection agency fees, incurred by the university in collecting monies owed to the university. The university will assess a \$25.00 fee for any check or e-payment returned by the bank and reserves the right to invoke the laws of the State of Tennessee governing bad check laws.

E-Billing and Access to a Student's Vanderbilt Account

Vanderbilt exclusively uses convenient and secure electronic billing (e-bills) for student account charges. **Students may need to take action** to enable parents, guardians, and other "invited payers" to receive e-bill notices and access to the e-bill website. Students may access their online invoices from their YES landing page at yes.vanderbilt.edu. Once they have signed in to YES, they may view invoices under the Billing Portal link.

Students are responsible for granting access to parents, guardians, or other payers who should receive email billing notifications. To do this, students log in to YES and click the "billing portal link." On your CashNet Account page, click "Add New" in the "Other Payers" section. Enter the information that is requested, and click "OK." (You must enter the "login name" that your authorized payer will use as a username—the logon and password will be sent to your authorized payer in an email.) Tutorials are located online at vanderbilt.edu/stuaccts/ebill.html.

Any month in which there is activity on the student's account, an e-bill will be generated and an email notification sent to the student's Vanderbilt email address, as well as to the email addresses of others they have invited. The email notification will have the subject line "Your E-Bill Is Now Available for Viewing" and will contain a link to the secure e-bill website.

Payments may be made electronically, or for those wishing to mail a payment, a payment coupon can be printed. When an electronic payment is made, a confirmation email will be sent. **It remains the responsibility of the student to ensure that bills are paid on or before the due date.**

The Office of Student Accounts can be contacted at (615) 322-6693, toll-free at (800) 288-1144, or via email at student.accounts@vanderbilt.edu. For additional information, please visit the Student Accounts website at vanderbilt.edu/stuaccts.

Refunds of Tuition and Housing Charges

University policy for the refund of tuition and housing charges provides a percentage refund based on the time of withdrawal. Students who withdraw officially or are dismissed from the university for any reason may be entitled to a partial refund. Students who register for more than 18 hours and later reduce their registration to 18 hours or fewer may be entitled to a partial refund of the extra tuition for hours over 18. Fees are nonrefundable. The refund schedules may be viewed at vanderbilt.edu/stuaccts.

Tuition Refund Insurance is offered through the Office of Student Accounts. This elective plan provides coverage for tuition and housing in the event a student withdraws from school due to medical reasons. Go to collegerefund.com for more information or to apply online.

Payment Options

Direct Payment: Tuition, fees, and all other charges are paid directly to the university. Payment for the fall semester is

due by August 31. Payment for the spring semester is due by January 2. Students can pay online after viewing their e-bill at vanderbilt.edu/stuacct. There is no further action required for this option.

Interest-Free Monthly Payment Plan: Students can spread payment over five monthly installments for each semester (fall and spring), interest free, by enrolling in the VANDYPlan, currently administered by Higher One. The deadline to enroll in the VANDYPlan is August 31 for the fall semester (payments begin May 15) and January 31 for the spring semester (payments begin October 15).

The current estimated charges for the academic year are available at vanderbilt.edu/stuacct to assist students in determining their annual expenses. For further information, please contact the Office of Student Accounts at (615) 322-6693 or (800) 288-1144.

Late Payment of Fees

All charges not paid by the specified due dates will be assessed a late payment fee of \$1.50 on each \$100 owed (minimum late fee of \$5).

Financial Clearance

Transcripts (official or unofficial) will not be released until the account has been paid. Diplomas of graduating students will not be released until all indebtedness to the university is cleared.

Student Service Fees and Identification Card

All degree-seeking undergraduate students pay student service fees that entitle them to admission to certain athletic, social, and cultural events and to subscription to certain campus publications. Specific information on these fees is published annually in the *Student Handbook*. The undergraduate student's identification card will admit students to university activities and the David Williams II Student Recreation and Wellness Center. It is also used as a library card and to stamp other documents. The card should be carried at all times and be returned to the university if the student withdraws for any reason.

Transcripts

Official academic transcripts are supplied by the Office of the University Registrar on authorization from the student. Transcripts are not released for students with financial or other university holds.

Fraternity and Sorority Membership

There is a financial commitment associated with joining a fraternity or sorority. The costs go toward inter/national fees, chapter operating expenses, and social functions. Financial obligations differ for fraternity and sorority members and among individual chapters. New members can expect to pay higher dues their first semester of membership. Dues for Interfraternity Council (IFC) men and Panhellenic women range from \$750 to \$1,500 per semester. Initiation fees for National Pan-Hellenic Council (NPHC) and Intercultural Greek Council (IGC) chapters range from \$500 to \$1,500 and continuing dues range from \$100 to \$500 each year. Additional costs throughout the semester may be for meal plans, conference attendance, philanthropic contributions, pictures, gifts, parties, T-shirts, etc. Chapter fees are paid directly to the fraternity or sorority. There are payment plans available to students, as well as scholarships within the individual chapters and also may

be available at the council-level. Many chapters participate in the Facility Management Program, and non-resident members pay \$322 each semester, charged to their student account, for the maintenance and upkeep of the chapter house. In addition, some fraternities pay an additional renewal fee which is deposited into their on-campus account to help pay down loans or create a savings account for future projects on the house.

Need-Based Financial Aid

Vanderbilt is committed to accessibility and affordability for all admitted and enrolled students. Grants, scholarships, and work opportunities are available to eligible students who apply for assistance and have demonstrated financial need. Beginning in the fall of 2009, financial aid packages offered to incoming and current undergraduate students no longer included need-based loans. While continuing to meet the full demonstrated need of all eligible students, this expanded aid initiative, Opportunity Vanderbilt, announced in October 2008 provides increased amounts of need-based grants and/or scholarships (gift assistance) to replace need-based loans that would have otherwise been offered to meet a student's demonstrated financial need.

Demonstrated financial need is the difference between the cost of attending Vanderbilt and the amount that students and their families are expected to contribute toward that cost. The amount of aid to fully meet each student's demonstrated financial need is determined annually on the basis of current financial information required/provided on relevant application forms.

Application Procedure

Prospective students need to complete a Free Application for Federal Student Aid (FAFSA) and a College Scholarship Service PROFILE. The FAFSA may be completed online at fafsa.ed.gov. Students may complete the CSS PROFILE online at collegeboard.org. The student must submit the FAFSA and PROFILE no later than February 3 of the senior year in high school. Further information regarding the application process is available from the Office of Student Financial Aid and Scholarships at vanderbilt.edu/financialaid.

Students must reapply for financial aid each year by submitting a CSS PROFILE and the FAFSA. Applications are available October 1 of each year. Renewal applicants must be in good standing and making satisfactory academic progress in order to continue receiving federal and institutional student aid funds. Renewal of university need-based assistance requires a minimum cumulative GPA of 2.0 for the sophomore, junior, and senior years. The priority consideration date for filing renewal applications is April 15.

Financial Aid for Early Decision Applicants

Early Decision applicants seeking financial aid must complete the FAFSA and College Scholarship Service PROFILE to be considered for Vanderbilt need-based grant assistance. The FAFSA may be completed online at fafsa.ed.gov. Students may complete the CSS PROFILE online at collegeboard.org. Early Decision I applicants should complete the CSS PROFILE no later than November 7 of the senior year in high school. Early Decision II applicants should complete the CSS PROFILE process no later than January 2 of the senior year in high school. Students will receive an estimate of their eligibility for financial aid with their offer of admission.

Federal Title IV Aid

Financial aid is available from several Federal Title IV student financial aid programs. Any citizen or eligible non-citizen of the United States who is accepted for admission and who demonstrates financial need is eligible to participate. This aid may be renewed annually by students who continue to qualify on the basis of financial need, if they are in good academic standing and are making satisfactory academic progress in accordance with standards prescribed by the U.S. Department of Education. (See Satisfactory Academic Progress.)

The FAFSA establishes eligibility for participation in federal aid programs. The loan programs also require completion of loan applications and/or promissory notes. Applicants should contact their state agencies for information regarding state aid programs and application procedures.

Vanderbilt participates in the following federal student financial aid programs:

- Federal Pell Grant Program
- Federal Supplemental Educational Opportunity Grant Program (FSEOG)
- Federal Work-Study Program (FWSP)
- Federal Direct Loan Program
- Federal Direct Parent Loan for Undergraduate Students (PLUS)

In addition to the federal student financial aid programs, Vanderbilt administers a number of need-based institutional scholarship, grant, and loan programs. University general sources of need-based assistance and loan funds available to students in all schools are listed.

Satisfactory Academic Progress Standards for Undergraduate Students

Academic progress for students receiving Vanderbilt University (institutional) need-based and/or federal Title IV financial assistance will be reviewed at the end of each academic term. Students must be meeting progress standards as defined by the Office of Student Financial Aid and Scholarships. These standards may be stricter than those defined in the academic standards applied by each of the individual undergraduate schools.

Institutional need-based aid assistance, including Vanderbilt need-based grants and scholarships, and federal Title IV financial aid are awarded for the academic year as determined by eligibility criteria for each financial aid program. Renewal and continuation of awards will be contingent upon maintaining satisfactory academic progress (SAP). The undergraduate requirements below are separate from the Academic Eligibility Policy required of all undergraduate students. Students must obtain a minimum grade point average outlined below. We realistically anticipate that the level of academic performance for each student will be higher than the minimum required cumulative GPA for renewal of Vanderbilt and federal financial aid programs. Students must successfully complete at least $\frac{2}{3}$ (67%) of all credit hours attempted ($\frac{\text{Completed Hours}}{\text{Attempted Hours}} = \text{Completion Rate}$). Students must also complete their degree requirements within 150% of the length of your academic program for Title IV eligibility. For example: Arts and Science degrees require 120 completed credit hours, meaning the maximum timeframe is 180 attempted credit hours.

Satisfactory Academic Progress Standards

Grade Level	Cumulative GPA	Required earned credit hours
Freshman	1.8	0–23
Sophomore	1.8	24
Junior: Peabody and A&S	2.0	54
Junior: Blair and Engineering	2.0	54
Senior: Peabody and A&S	2.0	84
Senior: Blair and Engineering	2.0	86

All recipients who enroll full-time are expected to earn a minimum of 12 credits per semester.

Note: A reported grade of *I* or *M* are calculated as a zero grade point. The student is responsible for notifying the Office of Student Financial Aid if an earned grade is later received. Credit hours for a reported *W* are included in Attempted Hours.

Financial Aid Warning

For students who are making satisfactory progress, the award commitment for the subsequent year will normally be made for the entire academic year. For students who fail to complete the required credit hours within the specified time frame and/or who fail to maintain the minimum GPA, the student will receive a **warning** and the financial aid commitment will be made for one subsequent semester only. Further review will be undertaken at the end of that semester. If the student fails to complete the required credit hours and/or fails to maintain the minimum GPA within the subsequent semester, institutional and/or federal financial aid will be **suspended**.

Appeal Procedures

Any student whose institutional and/or federal Title IV student aid is **suspended** due to unsatisfactory academic progress may submit an appeal for reinstatement of such assistance to the Office of Student Financial Aid and Scholarships. The appeal for reinstatement should include the following elements:

- An explanation of extenuating circumstances, such as injury, illness, death of a relative, or other special circumstance as to why you failed to meet satisfactory academic progress requirements.
- An explanation of what has changed that will now allow you to demonstrate satisfactory academic progress at the end of the next semester.
- Supporting documentation from medical doctors, advisers, psychologists, etc., to verify the information you are including in your personal statement. Failure to provide information may result in your appeal being denied.

The student will be notified of the appeal approval or denial and if eligibility for institutional and/or federal financial aid funds will be reinstated for one additional semester on a **probationary** basis.

Financial Aid Probation

At the end of a **probationary** semester, students must then meet Satisfactory Academic Progress for continued eligibility of financial assistance. If a student fails to meet Satisfactory Academic Progress all institutional and/or federal Title IV financial aid will be **suspended**. A student may make a subsequent appeal for continuation of such assistance to the Office of Student Financial Aid and Scholarships. A student's submitted appeal after a Probation status will be reviewed by an Institutional Appeal Committee. If it is determined that the student's failure to meet academic progress was the result of illness, death in the family, or other exceptional or mitigating circumstances, those factors will be considered in determining whether or not eligibility for federal and/or institutional student aid funds can be reinstated for one or more semester(s) while following a prescribed *Academic Plan* as defined by the Institutional Appeal Committee.

Academic Plan

Students must meet the standards set forth in an *Academic Plan* that has been established to ensure that satisfactory academic progress will be met by a specific point in time in order to continue receiving institutional and/or federal Title IV financial assistance. Students who fail to earn the minimum credit hours and GPA specified in their established *Academic Plan* will have all financial assistance **suspended** until the academic deficiency is corrected.

Reinstatement of Institutional and/or Federal Title IV Assistance

If students fail to progress as outlined above, they will not be eligible to receive further aid and will be notified that they may appeal for reinstatement of institutional and/or federal aid funds in any following/subsequent semester **after** demonstrating progress toward earning their degree by improving the cumulative GPA to a 2.0 and/or credit hour completion rate so that they again meet the minimum requirements. It will be the responsibility of the student to contact the Office of Student Financial Aid and Scholarships to request the reinstatement of his/her institutional and/or federal assistance.

Maximum Aid Eligibility

Vanderbilt University (institutional) need-based assistance: A maximum time frame of four years (eight semesters or its equivalent) of full-time enrollment is established for attainment of a baccalaureate degree when determining eligibility for the receipt of institutional financial aid. Terms enrolled and credits earned at prior colleges/universities and accepted toward the student's undergraduate degree may be counted toward the maximum time frame for Vanderbilt financial assistance.

Federal Title IV assistance: A maximum time frame of 150% of the required credit hours to receive a degree or six years (twelve semesters or its equivalent) of full-time enrollment is established for attainment of the baccalaureate degree when determining eligibility for the receipt of funds through federal Title IV student financial aid programs. Credit hours earned at prior colleges/universities and accepted by Vanderbilt University will be included in the quantitative evaluation and maximum time frame evaluation.

Merit-based Financial Aid

Each year Vanderbilt awards merit-based scholarships to first-year applicants who demonstrate exceptional accomplishment and intellectual promise. These students represent the top 1 percent of all freshman applicants to Vanderbilt, and with the limited number of merit scholarships available, the selection process is very competitive. Additional information regarding the availability of merit-based scholarships and the application process can be found at vanderbilt.edu/scholarships.

Student Employment

A primary source of employment opportunities for students interested in part-time on- or off-campus employment is through access to an online job bank, *HireADore.com*. Many university, medical center, and off-campus employers post their open positions on *HireADore.com* at appropriate times throughout the year. The Federal Work Study (FWS) Program is a Federal Title IV program and eligibility for it is determined upon completion of the Free Application for Federal Student Aid (FAFSA) and other required application materials. Vanderbilt has positions available, on a limited basis, for both FWS and non-FWS eligible students. All students hired into on-campus positions will need to complete the federally required I-9 work authorization paperwork/process. More information may be found at vanderbilt.edu/studentemployment or by calling (615) 343-4562.

University General Medals, Prizes, and Awards

Also see the Honors chapters in the College of Arts and Science, Blair School of Music, School of Engineering, and Peabody College sections of this catalog for listings of additional awards and prizes.

THE JESSICA ACESTE AND ELIZABETH BEALE RIPPLE IN THE POND AWARD was established in 2001 by Mr. and Mrs. George G. Strong through the Strong Family Foundation to reward an undergraduate student in any area of the university for random acts of kindness. The award was created to express the extreme gratitude of Mr. and Mrs. Strong in recognition of the assistance and care that their daughter, Meredith, received from her friends and the Vanderbilt community as she was stricken with meningococcal meningitis. Physicians credit the quick action taken by Meredith's classmates and Vanderbilt personnel with saving her life.

THE CHARLES FORREST ALEXANDER PRIZE IN JOURNALISM was endowed in 1982 by friends of Mr. Charles Forrest Alexander, B.A. 1950, who died in 1976. As a student, he was editor of the *Commodore*, *V Book*, and a staff member of the *Hustler*. The fund provides support for an annual prize to be awarded to a student who has achieved distinction in journalistic projects at Vanderbilt University.

THE GREG A. ANDREWS CIVIL ENGINEERING MEMORIAL AWARD was established in 1969 by James M. Andrews, Sr. to support a senior in civil engineering who has made the greatest progress and who plans to pursue graduate study in environmental and water resources engineering at the School of Engineering. Donor established the fund to honor the memory of his son, Greg, a junior at Vanderbilt who was fatally injured in an auto accident.

THE THOMAS G. ARNOLD FUND was established in 1988 by multiple donors to provide an award for the best research/design project completed by a senior student in the Biomedical Engineering Department at the School of Engineering. The fund was established by family, colleagues, and other friends of Mr. Thomas Arnold Jr., G 1956, in recognition of his long and distinguished service to Vanderbilt from 1952 until his retirement in 1989. Mr. Arnold died in 1989.

THE DAN BARGE JR. AWARD IN CIVIL ENGINEERING was established in 2011 by multiple donors as an award to give to a junior civil engineering student who exhibits outstanding academic performance and dedication to professional or community service at the School of Engineering. This fund was established to honor the legacy of Daniel B. Barge Jr., B.E. 1943, who was named a Distinguished Alumnus by the School of Engineering in 1981. Dan served his school in numerous capacities, both formal and informal: as an advisor, an employer of graduates, a donor, volunteer solicitor, and most importantly, as a role model for students. For many years, thanks to Dan's efforts, the school has presented an annual American Society of Civil Engineers (ASCE) Award, given in recent years as the ASCE/Dan Barge Award, to honor Dan's professional accomplishments and contributions to ASCE that culminated in his 1987 presidency.

THE MORRIS H. BERNSTEIN JR. PRIZE IN LATIN DECLAMATION was endowed in 1983 by Mr. William H. Bernstein, B.A. 1983, open to any undergraduate student who has completed at least two semesters of Latin at Vanderbilt University. Contestants shall deliver from memory selected Latin prose or poetry passages which reflect the classical ideal. The fund is named for Mr. Bernstein's father, Dr. Morris H. Bernstein, Jr., B.A. 1943, M.D. 1946.

THE BLAIR STUDENT SERVICE AWARD fund established in 2009 by an anonymous donor to provide an annual award for the Blair student who best exemplifies the spirit and tradition of volunteer service through music at the Blair School of Music.

THE GLENN AND ELIZABETH BOGITSH AWARD was established in 1989 by Burton J. Bogitsh, professor of biology, and Mr. and Mrs. James T. Norris, Jr., to provide an annual award to the student at Vanderbilt University who has best demonstrated a strong commitment to campus recreational programs and, by example and leadership, has inspired participation and sportsmanlike conduct in these activities. The award recognizes physical fitness, participation in recreational sports, and sportsmanship and was established to honor the memory of the Donors' son, Glenn, and daughter, Libby, both Vanderbilt graduates who died in a 1988 plane crash. The award recipient will be given a small prize and will have his or her name engraved on a plaque, which describes the award and lists annual winners, to be mounted on a wall of the Student Recreation Center.

THE CASEY CARTER BONAR LEADERSHIP AWARD was established in 2011 by multiple donors to provide awards to undergraduate students in their senior year based on leadership, broad collaboration, enthusiasm, passion for campus involvement, selfless service to Vanderbilt, and dedication to positive change at Vanderbilt University. This fund was established to honor the memory of Casey Carter Bonar, B.A. 1985, a dedicated and selfless leader who inspired excellence and propelled others to join in her commitment to serve. Casey's vitality, warmth, compassion, and boundless enthusiasm served to energize and enhance each of the many campus activities in which she was involved, including student government, student media, Greek life, and Impact. Her passion for facilitating friendship and camaraderie for higher purpose, for promoting service to all and helping expand the horizons of the "underdog," earned her the lifelong gratitude and admiration of her Vanderbilt community. An active member of the Alumni Association Board, she often interviewed prospective students and organized alumni activities. Casey was proud of her Vanderbilt education. She exemplified Cornelius Vanderbilt's vision of strengthening the ties that bind as she consistently reached out to make someone's life better.

THE MARGARET BRANSCOMB PRIZE was established in 1993 to support an undergraduate prize at the Blair School of Music. The wife of Vanderbilt's fourth Chancellor, Harvie Branscomb (1946–1963), Mrs. Branscomb served as president of the Vanderbilt Garden Club from 1952 to 1954. Historically, the prize is given annually to a Blair freshman judged by the faculty to have the musical and personal qualities that best exemplify the spirit and standards of the school.

THE SUE BREWER FUND SCHOLARSHIP was established in 1987 by the Songwriters Guild Foundation to provide support to either composition or guitar majors at the Blair School of Music. To qualify, an entering freshman must be ranked in the upper 25th percentile of his or her class, and an upperclassman must have maintained at least a 3.0 GPA in the performance area, a 2.5 GPA in music, and a 2.0 overall GPA. This fund was

established in memory of Sue Brewer, who befriended many of Nashville's struggling songwriters in the late 1960s and early 1970s.

THE FRANKLIN BROOKS MEMORIAL AWARD was established in 1995 by multiple donors to defray travel costs for students studying in France through the Vanderbilt in France program at the College of Arts and Science. This fund was established in memory of H. Franklin Brooks, former associate professor of French and three-time director of the Vanderbilt in France program during his 25-year teaching career at Vanderbilt.

THE LARRY ROSS CATHEY AWARD was established in 1974 by Arnold M. Heiser to support an award that will recognize the most outstanding student majoring in astronomy in the Astronomy Department at the College of Arts and Science. This award was established in 1974 in memory of Larry Ross Cathey, who graduated in 1966 with honors in physics and astronomy.

THE NORA C. CHAFFIN SCHOLARSHIP was established 1956 by the Women's Council of the Women's Student Government Association to provide scholarship support for deserving undergraduate students at Vanderbilt University. This fund was established in honor of Nora C. Chaffin, former Dean of Women known for her service and loyalty to Vanderbilt University and its women students. The scholarship is awarded to a junior student who has displayed service to the University in the area of student government, religious, literary and scholastic activities, and in the arts.

THE CLASSICS DEPARTMENT STUDENT TRAVEL FUND FOR ROME, ITALY was established in 2006 by Richard H. Davis, B.E. 1969, and Barbara C. Davis, B.S.N. 1969, to support undergraduate student travel expenses in Rome, Italy, through the Classics Department at the College of Arts and Science.

THE PAUL CONKIN FUND was established in 1999 by an anonymous donor to establish a prize for the best undergraduate term paper written on American History in the History Department at the College of Arts and Science. Paul Conkin, Distinguished Professor of History Emeritus at Vanderbilt University, is the author of the history of Vanderbilt University, *Gone with the Ivy*, and the *Peabody College History* which was published in 2002.

THE COOLEY MEDAL was established in 1920 to provide recognition for students who excel in fine arts at the College of Arts and Science. The medal is named after Comrade Theodore Cooley, known as one of the most public-spirited citizens of Nashville. Cooley was a successful Nashville businessman and supporter of the Tennessee Centennial and International Exposition held in Nashville in 1897 at the current location of Centennial Park on West End Avenue.

THE WALTER CRILEY PRIZE PAPER AWARD was established in 1978 by Robert Derrick, B.E. 1954, and the Simons-Eastern Company to be given for the best paper on an advanced senior project in electrical engineering at the School of Engineering at Vanderbilt University. This award was created in honor of Walter Criley, professor emeritus of electrical engineering, who taught from 1947 until his retirement in 1965. Professor Criley helped organize both the student chapter and the Nashville section of the Institute of Electrical Engineers, and also served as southeastern regional vice-president of the National Institute of Electrical Engineers. He passed away in 1977.

THE DONALD DAVIE MEMORIAL POETRY PRIZE was established in 2005 by multiple donors to support an annual prize to be awarded each spring to the best poem submitted by a current graduate student in the Department of English at the College of Arts and Science. This fund was created in memory of poet and Vanderbilt University professor Donald Davie.

THE EDWARD PRENTICE DAVIS MEMORIAL PRIZE was established in 1997 by classmates of Mr. Edward 'Ward' Prentice Davis, B.A. 1987, to provide support for an annual prize awarded to a deserving NROTC college program midshipman. Ward was commissioned as a Second Lieutenant in the United States Marine Corps and served honorably for three years as an artillery officer. To his Marine Corps peers, Ward was an inspiration because he pursued his commission as a college program midshipman, without any scholarship. Ward passed away in 1995. This fund was established to honor Ward's commitment and perseverance.

THE ALLAN P. DELOACH MEMORIAL PRIZE IN PHOTOGRAPHY was established in 1998 by Mr. Rusty Edmister and Mrs. Pat Adams to support a prize in photography in the Fine Arts Department at the College of Arts and Science. This fund was established in memory of Mr. Edmister's and Mrs. Adam's former co-worker at IBM and Vanderbilt University alumnus, Allan P. DeLoach, B.A. 1963. The award is open to any student who has taken a studio class of any discipline. Students will submit one to three photographs to be judged by a professional photographer, outside of the Vanderbilt community, who will pick the winner and give a slide lecture to students on his/her work.

THE ROBERT V. DILTS AWARD was established in 1994 by multiple donors to provide an award to a deserving undergraduate chemistry student in the Department of Chemistry at the College of Arts and Science. This award was established to honor Professor Robert V. Dilts, who served on the chemistry faculty from 1960 to 1994.

THE ARTHUR J. DYER JR. MEMORIAL PRIZE was established in 1938 by Arthur J. Dyer, Sr. to award a medal to the Civil Engineering student in his/her senior year who shows the greatest proficiency in the study and/or design in the use of structural steel at the School of Engineering, and who is a student member of the American Society of Civil Engineers. This fund was established in memory of a former Vanderbilt student, Arthur James Dyer, Jr., who was injured while prosecuting engineering duties on a bridge at Panama City, Florida, and died September 2, 1928.

THE DAVID ELIA AWARD was established in 2002 by Mrs. Jean M. Elia to provide a \$300 annual award to a varsity women's soccer player in the Department of Student Athletics.

THE T. ALDRICH FINEGAN AWARD FOR EXCELLENCE IN UNDERGRADUATE ECONOMIC RESEARCH was established in 2005 by T. Aldrich Finegan, Professor Emeritus, to recognize excellence in undergraduate research conducted by a senior graduating from the economics honors program. The award should be given for an outstanding thesis written by a student in the Department of Economics Honors Program at the College of Arts and Science.

THE EDWIN S. GARDNER MEMORIAL PRIZE FOR EXCELLENCE IN FRENCH was established in 1980 by Grace D. Gardner, B.A. 1932, to be used, at the discretion of the Department of French at the College of Arts and Science, in one of two ways: 1) to fund an annual award to a graduating senior excelling in French studies, or 2) to purchase books for the French collection in Jean and Alexander Heard Library. Donor made this gift in honor of her late husband, Edwin S. Gardner, B.A. 1927, who served as treasurer of Vanderbilt from 1953 to 1971.

THE GENERAL MOTORS POLITICAL SCIENCE FUND was established to support undergraduate prizes for political science students at the College of Arts and Science.

THE GEYER AWARD was established in 1979 by Mr. Richard A. Geyer Jr. to support a competitive journalism award designed to give recognition to campus reporters "who consistently write articles resulting from thorough research" and whose articles are, at the same time, "lively, informative, and logical" in any area of Vanderbilt University.

THE GUY GOFFE MEANS AWARD was established in 1975 through the bequest of Marie Hochle Means to provide an award to a student with ability in creative writing in the Department of English at the College of Arts and Science.

THE NORMAN L. AND ROSELEA J. GOLDBERG PRIZE was established in 1988 by Roselea J. Goldberg to support an annual award for the best manuscript submitted each year to Vanderbilt University, preferably in the area of art and medicine. The manuscript will be judged by a committee from Vanderbilt University Press.

THE JOHN P. GREER AWARD was established in 2006 by Professor John and Mrs. Shirley Lachs to provide an award to graduating seniors majoring in philosophy and going to medical school. Donors established this award in honor of Dr. John P. Greer, Professor of Medicine in Vanderbilt's Department of Hematology, to commend his career path and in gratitude of the care given by Dr. Greer to Mrs. Lachs.

THE LARRY C. HALL STUDENT TRAVEL FUND was established in 1995 by multiple donors to support a student traveling to the Pittcon Conference, a chemistry related conference, through the College of Arts and Science. The fund was established in honor of Dr. Larry Hall at the time of his retirement.

THE MARGARET STONEWALL WOOLDRIDGE HAMBLET FELLOWSHIP was established in 1985 by Clement H. Hamblet and Margaret Hamblet Sarnier at the College of Arts and Science. The fellowship was established in memory of Margaret Hamblet's love of art and travels to Europe to study art. Margaret Hamblet was a graduate of Peabody College in the Class of 1926. Clement and Margaret Hamblet met in Paris where Margaret was an art student. The fellowship is awarded to a deserving senior with outstanding merit in art and completion of three or more studio art courses and provides one year of travel and furtherance of creative endeavor following graduation from the College of Arts and Science. The second priority for the fund is to provide a continued small subsidy for a second graduating senior.

THE ANDREW SANG HAN MEMORIAL AWARD was established in 2017 to support an award for a woodwind or brass student at the Blair School of Music who demonstrates remarkable musicianship and leadership in all areas of ensemble playing. The award honors Sang Han, a clarinet performance major at the Blair School of Music from 2012–2015. Sang's dedication to excellence in all areas of performance, as well as the care and consideration he showed his peers, served as an example to his friends and colleagues at Blair.

THE JEAN AND ALEXANDER HEARD AWARD was established in 2013 by the children of Jean and Alexander Heard to provide need-based financial assistance to deserving undergraduate students who have been accepted to one of the summer music festivals through a summer study program at the Blair School of Music. This fund was established in memory of Jean and Alexander Heard. Chancellor Alexander Heard served as Vanderbilt University's fifth Chancellor from 1963 to 1982 and oversaw many changes in the campus. Under his tenure, Peabody College, Blair School of Music, and the Owen Graduate School of Management became part of the University.

THE JEAN KELLER HEARD PRIZE was established in 1985 by the Vanderbilt Woman's Club to provide an award for excellence in music performance to a string student seeking a Bachelor of Music degree at the Blair School of Music. This fund was established to honor violinist Jean Keller Heard, the wife of Vanderbilt's former Chancellor Alexander Heard. Mrs. Heard passed away in 2011.

THE FRANK HOUSTON AWARD FOR ORATORY was established in 1974 by Mr. Frank K. Houston, B.A. 1904, and former member of the Vanderbilt Board of Trust, to support an annual prize given to a student who excels in a presentation in public speaking in any department at Vanderbilt University. Mr. Houston grew up in Murfreesboro, Tennessee, and took public speaking while he was a student at Vanderbilt. He established this competition to encourage competent public speaking, as he believed that his experience at Vanderbilt had made a very real difference in his own life.

THE MELVIN D. JOESTEN SCIENCE VOLUNTEER AWARD FUND was established in 1998 by multiple donors to provide an award for outstanding science student volunteers in the Chemistry Department at the College of Arts and Science. This endowed fund was established in the name of Melvin "Mel" D. Joesten in recognition of his many years of service to the department and to Vanderbilt University.

THE MARK M. JONES UNDERGRADUATE AWARD IN INORGANIC CHEMISTRY was established in 1998 by colleagues and other friends of Professor Jones to recognize undergraduates who have excelled in inorganic chemistry at the College of Arts and Science. Preference will be given to students showing excellence in undergraduate research. Dr. Jones taught chemistry from 1957 until his retirement in 1998 and chaired the chemistry department from 1970 until 1976.

THE MICHAEL B. KEEGAN TRAVELING FELLOWSHIP was established in 2004 by Michael B. Keegan and others to provide one or more graduating undergraduate student(s) with an opportunity to study and travel abroad in pursuit of an issue or topic of personal and intellectual passion. The Fellowship will provide a minimum of one annual award, each in the amount of not less than \$10,000 to help pay for travel expenses for the recipient(s), al-

lowing the recipient(s) to study and possibly work outside the United States of America for approximately one year. The fund was established as an international fellowship to foster in the student(s) a sense of his/her potential as a citizen of the world, and as a traveling fellowship to create a deep cross-cultural experience.

THE W. G. KIRKPATRICK ENGINEERING PRIZE was established in 1926 through a bequest from Walter Gill Kirkpatrick, B.E. 1887, B.S. and M.S. 1889, to provide support for an annual prize for the most deserving third-year student in the Department of Civil Engineering at the School of Engineering.

THE MAGDA LACHS AWARD was established in 2008 by Brenda Higgins, a former employee in Development and Alumni Relations for the Blair School of Music, to support a voice or orchestra student at Blair who participates in the opera presentation in the school year in which it was given.

THE C. MAXWELL LANCASTER AWARD FOR EXCELLENCE IN ITALIAN was established in 1990 by Professor Luigi Monga to honor the memory of C. Maxwell Lancaster, Professor of French and Italian at Vanderbilt University from 1939 until his retirement in 1976, and to promote the study of the Italian language and literature at Vanderbilt University. The annual prize will consist of a medal which will be awarded to a fourth-semester student for excellence in Italian, at the recommendation of the faculty of the Department of French and Italian.

THE R. J. LARSEN PRIZE FOR EXCELLENCE IN MATHEMATICS was established in 2005 by multiple donors to provide an award to a graduating senior for excellence in mathematics at the College of Arts and Science. This fund was established in honor of Professor Richard Larsen to celebrate his retirement. Professor Larsen worked in the Department of Mathematics at the College of Arts and Science for over thirty years.

THE JOEL CARL LICHTER MEMORIAL AWARD was established in 1996 by Professor and Mrs. Barry D. Lichter to provide an award that will be presented each year at the Magnolia Awards ceremony to a graduating senior who contributes by example to the promotion of outdoor education, combining academic excellence and expertise in wilderness skills along with friendship and service to others in any area of Vanderbilt University. Professor and Mrs. Lichter established the award to honor the life of their son Joel Lichter, an avid outdoorsman who graduated from Vanderbilt University magna cum laude in 1981 with honors in chemical engineering. Joel Lichter died in a 1992 accident in Alaska while commercial fishing.

THE LEE J. LOVENTHAL PRIZE was established in 1937 by Mr. Lee Jefferson Loventhal, class of 1896 and member of the Vanderbilt University Board of Trust from 1919 to 1940, to establish a prize in the Department of Communication Studies.

THE S. S. AND I. M. F. MARSDEN AWARD IN MUSICAL SCHOLARSHIP was established in 1998 by Dr. Sullivan F. Marsden for a written paper on a topic that might lie outside the normal core of scholarship at the Blair School of Music. The award will be an annual \$1,000 prize to encourage and recognize excellence in scholarship.

THE THOMAS W. MARTIN MEMORIAL AWARD was established in 1992 by multiple donors to support an award recognizing an outstanding undergraduate physical chemistry student at the College of Arts and Science. This fund was established in memory of Thomas W. Martin Jr., chair of the Department of Chemistry from 1967 to 1970.

THE CARL MASON AWARD was established in 1986 to provide assistance to incoming graduate students in the area of environmental engineering in the School of Engineering.

THE DELENE LAUBENHEIM MCCLURE MEMORIAL PRIZE IN OPERA was established in 1997 by multiple donors to provide support for voice majors who exhibit excellence in opera at the Blair School of Music.

THE JOHN T. AND LIZZE ALLEN MCGILL AWARD was established in 1960 by Mrs. John T. McGill to provide an award to one or more residents of McGill Hall who have the best developed qualities of leadership and scholarship. This fund was established in memory of Mrs. McGill's husband who passed away in 1946, and who spent his life in service to Vanderbilt as a student in the class of 1879, professor emeritus of chemis-

try, Dean of the School of Pharmacy, and historian of the university. Preference in awarding is for a freshman with financial need.

THE SAMUEL T. MCSEVENEY AWARD was established in 2001 by Professor Samuel T. McSeveney to recognize an undergraduate student with the best paper written in a freshman seminar in the Department of History.

THE MERRILL MOORE AWARD was established in 1961 by Mrs. Merrill Moore, Vanderbilt alumna and widow of the late Merrill Moore, M.D. 1928, to provide a cash award to a student graduating from Vanderbilt University or a junior or senior student on the basis of the student's literary promise and the psychological or practical usefulness of award to him/her at the College of Arts and Science. Dr. Moore was an internationally known Boston psychiatrist and a poet.

THE HENRIETTA HICKMAN MORGAN PRIZE was established in 1946 by William B. Morgan II to provide awards to freshmen students with the best pieces of original writing at the College of Arts and Science. This fund was established in memory of the donor's wife, Henrietta Hickman Morgan. Mrs. Morgan received her B.A. in 1938 from Vanderbilt University and was a member of the Kappa Alpha Theta sorority, and Phi Beta Kappa Phi Sigma Iota, an honorary romance language group. She served as flag secretary and aide to Rear Admiral Martin K. Metcalf for more than two years before falling ill in 1945.

THE NED PARKER NABERS AWARD was established in 1984 by multiple donors to provide an annual prize for the best essay or research paper by an undergraduate student in the fields of classical archaeology or ancient art or architecture. The fund was established in memory of Ned Parker Nabers who served on faculty from 1966 until his death in 1984.

THE DANA W. NANCE PRIZE was established in 1985 by Professor Francis C. Nance, B.A. 1953, and family to provide an annual award to a student at the College of Arts and Science. The award will recognize an outstanding student from the pre-medical curriculum who has demonstrated perseverance in overcoming academic, financial, or social obstacles to succeed, who is well-trained in the technical skills acquired through the undergraduate pre-medical curriculum, and who possesses an abiding sense of ethical and moral concern for the patient. The fund was established to honor Dana W. Nance, B.A. 1925, M.D. 1929, who served for many years as the area chairman of the Vanderbilt Alumni Fund.

THE ELLIOTT AND AILSA NEWMAN CLARINET AWARD was established in 1999 through the bequest of Ailsa MacKay Newman along with additional memorial gifts to provide an award to a deserving clarinet student at the Blair School of Music. Preference when awarding is given to a clarinet major who shows strong musical promise. If a clarinet major is not available, the award should be given to a woodwind student. This fund is named for Mrs. Newman and her husband, who predeceased her.

THE L. HOWARD NICAR MEMORIAL FUND was established in 1997 by multiple donors to award a prize or scholarship to a collegiate student at the Blair School of Music. This fund was established in memory of L. Howard Nicar, former Assistant Dean of Admissions at the Blair School of Music.

THE DONALD E. PEARSON AWARD was established in 1980 by the Chemistry Department and endowed in 2008 by Dr. and Mrs. Frank Pinkerton to provide support for an annual award to an outstanding chemistry major who has done undergraduate research in chemistry. Professor Donald E. Pearson served as faculty in the Department of Chemistry at the College of Arts and Science until his retirement in 1986.

THE PHI BETA KAPPA CENTENNIAL AWARD was established in 1998 by the Phi Beta Kappa Council to provide support for an annual award at the College of Arts and Science. This fund, established in celebration of the Alpha of Tennessee chapter's centennial in 2001, will be presented to a Vanderbilt senior who has been elected to Phi Beta Kappa in their junior year and who has demonstrated excellence in several different fields of academic endeavor, and has applied his or her intellectual talents in extracurricular activities within the university or community that exemplify a dedication to improve the human condition.

THE EMILY ANN BENNETT PLANT AWARD IN ANTHROPOLOGY was established in 1995 by Emily Ann Bennett Plant, B.A. 1994, to provide financial support based on merit and need to recognize excellence in the study of anthropology at the College of Arts and Science. The award may be applied to the cost of tuition and living expenses or to fund supplemental educational activities that will enrich the study of anthropology, such as summer research or participation in a field school.

THE ROBERT PETER PRATT MEMORIAL AWARD was established in 1991 by multiple donors to honor Robert Peter Pratt (1954–1991), former associate director of Undergraduate Admissions and longtime leader in promoting diversity within the student population. The award is presented annually to the Chancellor's Scholar whose accomplishments best exemplify Peter Pratt's commitment to diversity and unity, leadership and cooperation, warmth and openness, and unselfish service to others. The award recognizes a Chancellor's Scholar of junior or senior standing whose campus leadership and service promote diversity and enhance understanding among the various groups that comprise the university community. Academic performance is also considered in selecting the award recipient.

THE DAVID RABIN PRIZE was established in 1985 by multiple donors to provide an annual prize to a student chosen on the basis of music ability and talent at the Blair School of Music. This prize was established in memory of Dr. David Rabin, former professor of medicine in obstetrics and gynecology at the School of Medicine. Dr. Rabin passed away in 1984.

THE JERRY REVES STUDENT ATHLETE GPA AWARD was established through funds from the terminated trust of Dr. Joseph Gerald Reves, Jr., B.A. 1965, to annually fund a plaque for the student-athlete with the highest GPA.

THE JIM ROBINS AWARD was established in 1969 by Michael G. Wagner, B.A. 1957, to honor the memory of James A. Robins, class of 1892, whose life and teaching exemplified selfless devotion to learning, to honor, to participation in sports and to service to youth and Vanderbilt. The prize is awarded to a member of the football team voted as the most outstanding representative of the group.

THE JOE L. ROBY NROTC ESPRIT DE CORPS AWARD was established in 2006 by Mr. Duff Anderson and Mr. W. Patrick McMullan III, B.A. 1974, to recognize and reward Vanderbilt NROTC Midshipmen who display outstanding enthusiasm and esprit de corp as members of the battalion through involvement in NROTC and university activities and provide inspiration to fellow midshipmen and students at Vanderbilt University. The award was created in honor of Joe L. Roby, B.A. 1961, Vanderbilt trustee emeritus, and a former Battalion Commanding Officer of the Vanderbilt NROTC Midshipmen Battalion in recognition of his inspiring leadership at Vanderbilt University and with the Vanderbilt Naval ROTC program and his subsequent service in the United States Navy.

THE KATHRYN SEDBERRY POETRY PRIZE was established in 2003 through the estate of Kathryn Sedberry, M.A. 1963, to provide support for an annual poetry prize in the Department of English at the College of Arts and Science.

THE JAMES G. STAHLMAN NROTC AWARD was established in 1972 by former Vanderbilt Trustee, James Geddes Stahlman, B.A. 1919, to provide an award to the top Navy ROTC member and the top Marine ROTC member from the senior class who have proven themselves to be the most outstanding in citizenship, scholarship, and leadership in the Naval ROTC unit. The award recipients will be chosen by their Commanding Officer.

THE DAVID STEINE ECONOMICS AND BUSINESS AWARD was established in 2006 by James B. Johnson Jr., B.A. 1954, to recognize undergraduates in the Managerial Studies Program at the College of Arts and Science who show exceptional promise for a career in business. The fund

may be awarded to any graduating student from any of Vanderbilt's four undergraduate schools who will graduate with at least one of the managerial studies program minors. The award was established to honor the memory and distinguished career of David Stein, a professor held in the highest esteem by the donor.

THE STEIN STONE MEMORIAL AWARD was established in 1948 by Mrs. James N. Stone to provide an award to students in the School of Engineering. This fund is to be awarded to a graduating senior who has lettered in a sport, preferably football, and who is judged to have made the most satisfactory scholastic and extramural progress as an undergraduate. This fund was established in memory of Mrs. Stone's late husband, James "Stein" N. Stone, student at the School of Engineering in 1908 and an "All Southern" center on the Vanderbilt University football team from 1904 to 1907.

THE HENRY LEE SWINT AWARD was established in 1976 by Frank A. Woods, B.A. 1963, LL.B. 1966, for an undergraduate history major with the best history essay or research paper in the Department of History at the College of Arts and Science. The fund was established in honor of Henry Lee Swint, a former Holland N. McTyeire Professor of History who served on the faculty from 1939 until his retirement in 1977.

THE ROBERT D. TANNER UNDERGRADUATE RESEARCH AWARD was established in 2005 by multiple donors to provide an award to an undergraduate student conducting research in the Department of Chemical Engineering at the School of Engineering. This award was established in honor of Dr. Robert D. Tanner, emeritus faculty, at the time of his retirement. Dr. Tanner was a professor of chemical engineering at Vanderbilt University.

THE JOEL TELLINGHUISEN PHI BETA KAPPA AWARD was established in 2006 by James B. Johnson, Jr., B.A. 1954, to recognize undergraduate students who have been initiated into Phi Beta Kappa and have shown exceptional ability at the College of Arts and Science. The award honors Joel Tellinghuisen, Professor of Chemistry, for his positive impact and influence in educating undergraduate students at Vanderbilt, including Mr. Johnson's daughter, Katherine Johnson, B.S. 1994, M.Ed. 1995. The annual awards will be made to graduating seniors who are members of Phi Beta Kappa, in recognition of outstanding performance in research as an undergraduate at Vanderbilt.

THE UNDERWOOD MEMORIAL AWARD was established in 1961 by Newton Underwood to support a senior in the Department of Physics or Department of Biology selected alternately by the head of the physics department and the head of the biology department to be awarded each year at commencement. The award honors his father, Judge Emory Marvin Underwood, B.A. 1900, LL.B. 1902, and a member of the Vanderbilt Board of Trust from 1922 until his death in 1960, who devoted his life to justice and to bringing out the best in people.

THE JACQUELINE AND MORRIS WACHS ESSAY PRIZE was established in 1999 by multiple donors to support a prize in the Department of French and Italian at the College of Arts and Science. This fund was established in memory of Jacqueline Wachs, former French professor from 1966 until her retirement in 1994, and Morris Wachs, emeritus professor of French at Vanderbilt. Mrs. Wachs died in 1999 and Mr. Wachs died in 2001.

THE WALTHER AWARD FOR VUCEPT EXCELLENCE (WAVE) was established in 2005 by Beverly R. Walther, B.S. 1990, MBA 1990, and Michael C. Walther II, B.S. 1989, MBA 1990, to reward undergraduate students serving as mentors in the VUcept orientation program at the discretion of the Provost and Vice Chancellor for Academic Affairs, or designee.

THE THOMAS M. WESER AWARD was established in 1989 by multiple donors to provide support for an annual award honoring an international student who has demonstrated an exceptional commitment to intellectual life, cross-cultural appreciation, and personal integrity at Vanderbilt University. Weser Award recipients are typically active in student organizations and community service projects outside of the classroom and maintain a solid record of academic performance at the undergraduate or graduate level. This fund was established in memory of Thomas M. Weser, an exchange student from Germany who was killed while attending Vanderbilt University in 1988.

THE MARTIN WILLIAMS AWARD was established in 1992 by multiple donors to provide an award to a music major writing the most outstanding paper for a music theory or literature/history course at the Blair School of Music. This fund was established in memory of Martin Williams, Director of the Smithsonian Institution's Jazz Program and Adjunct Professor of Jazz History at the Blair School of Music.

THE FRANK A. WOODS AWARD IN HISTORY was established in 2008 by Mr. James Lachs, B.S. 1993, to provide an award for a graduating senior majoring in history with the most distinguished academic record at the College of Arts and Science.

THE KATHERINE B. WOODWARD PRIZE IN SPANISH was established in 1943 by Katherine B. Woodward, B.A. 1919, to provide an award to the student with the highest average majoring in Spanish at the College of Arts and Science. Preference in awarding will be given to senior year students. Miss Woodward served as a teacher then head of the Spanish Department at the Woodrow Wilson High School in Portsmouth, Virginia, from 1919 until her retirement in 1956. She had a deep love for Vanderbilt and an intense interest in promoting the teaching of Spanish.

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Undergraduate School Catalog



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College of Arts and Science

JOHN G. GEER, Ph.D., Dean
C. ANDRÉ CHRISTIE-MIZELL, Ph.D., Dean of Undergraduate Education
BONNIE J. DOW, Ph.D., Dean of Academic Initiatives
KAMAL SAGGI, Ph.D., Dean of Faculty
DAVID W. WRIGHT, Ph.D., Dean of Graduate Education and Research
YOLLETTE T. JONES, Ph.D., Associate Dean of Undergraduate Education
ROGER E. MOORE, Ph.D., Associate Dean of Undergraduate Education
DANIEL MORGAN, Ph.D., Associate Dean of Undergraduate Education
JONATHAN PETTY, B.A., Associate Dean of Development and Alumni Relations
ANDREA HEARN, Ph.D., Assistant Dean of Undergraduate Education
PATRICK J. RETTON II, B.S., Chief Business Officer
HOLLIS CALHOUN, M.P.A., Executive Director of Strategic Affairs and Communications
MELISSA WOCHER, B.A., Administrative Director

Named and Distinguished Chairs

CELIA STEWART APPLGATE, William R. Kenan, Jr., Chair in History
HOUSTON A. BAKER, JR., University Distinguished Professor in English
LARRY M. BARTELS, May Werthan Shayne Chair in Public Policy and Social Science
LAUREN A. BENTON, Nelson O. Tyrone, Jr., Chair in History
MICHAEL D. BESS, Chancellor's Chair in History
DAVID BLACKBOURN, Cornelius Vanderbilt Distinguished Chair in History
RANDOLPH BLAKE, Centennial Professor in Psychology
ERIC W. BOND, Joe L. Roby Chair in Economics
KENDAL SCOT BROADIE, Stevenson Chair in Neurobiology
WILLIAM CAFERRO, Gertrude Conaway Vanderbilt Chair in History
MARIA CAMPOS-PONS, Cornelius Vanderbilt Chair in Art
CHRISTOPHER CARPENTER, E. Bronson Ingram Chair in Economics
KENNETH C. CATANIA, Stevenson Chair in Biological Sciences
JAY CLAYTON, William R. Kenan, Jr., Chair in English
JOSHUA D. CLINTON, Abby and Jon Winkelried Chair in Political Science
WILLIAM COLLINS, Terence E. Adderley, Jr., Chair in Economics
JEFFERSON R. COWIE, James G. Stahlman Chair in American History
KATHERINE CRAWFORD, Cornelius Vanderbilt Chair in Women's and Gender Studies and History
KATE DANIELS, Edwin Mims Chair in English
COLIN DAYAN, Robert Penn Warren Chair in the Humanities
ARTHUR A. DEMAREST, Ingram Chair in Anthropology
EMMANUELE DIBENEDETTO, Centennial Professor in Mathematics
DENNIS C. DICKERSON, Reverend James M. Lawson, Jr., Chair in History
TOM DILLEHAY, Rebecca Webb Wilson University Distinguished Chair in Anthropology and Religion and Culture
MARSHALL C. EAKIN, Distinguished Professor of History
TONY LEE EARLEY, Samuel Milton Fleming Chair in English
BRANDT F. EICHMAN, William R. Kenan, Jr., Chair
LYNN E. ENTERLINE, Nancy Perot Mulford Chair in English
EDWARD FISCHER, Cornelius Vanderbilt Chair in Anthropology
LEONARD FOLGARAIT, Distinguished Professor in History of Art
EDWARD H. FRIEDMAN, Gertrude Conaway Vanderbilt Chair in Spanish
ISABEL GAUTHIER, David K. Wilson Chair in Psychology
JOHN G. GEER, Gertrude Conaway Vanderbilt Chair in Political Science
LENN E. GOODMAN, Andrew W. Mellon Chair in the Humanities
JOHN C. GORE, Hertha Ramsey Cress University Chair in Radiology and Radiological Sciences and Biomedical Engineering and Physics
TODD R. GRAHAM, Stevenson Chair in Biological Sciences
SENTA VICTORIA GREENE, Stevenson Chair in Physics
RICHARD F. HAGLUND, JR., Stevenson Chair in Physics
BARBARA HAHN, Max Kade Foundation Chair in German Studies
JOSEPH H. HAMILTON, Landon C. Garland Distinguished Chair in Physics
JOEL HARRINGTON, Centennial Professor in History
DAVID J. HESS, James Thornton Fant Chair in Sustainability Studies
RUTH HILL, Andrew W. Mellon Chair in the Humanities
J. KELLY HOLLEY-BOCKELMANN, Stevenson Chair in Physics and Astronomy
STEVEN D. HOLLON, Gertrude Conaway Vanderbilt Chair in Psychology
GEORGE M. HORNBERGER, University Distinguished Professor of Civil and Environmental Engineering and Earth and Environmental Sciences
SARAH E. IGO, Andrew Jackson Chair in American History
ATSUSHI INOUE, Cornelius Vanderbilt Chair in Economics
LARRY W. ISAAC, Gertrude Conaway Vanderbilt Chair in Sociology
MARK JARMAN, Centennial Professor in English
CHRISTOPHER M. S. JOHNS, Norman L. and Roselea J. Goldberg Chair in Art History
CARL H. JOHNSON, Cornelius Vanderbilt Chair in Biological Sciences
JEFFREY N. JOHNSTON, Stevenson Chair in Chemistry
VAUGHAN JONES, Stevenson Distinguished Chair in Mathematics
JON H. KAAS, Gertrude Conaway Vanderbilt Distinguished Chair in Psychology
CINDY D. KAM, William R. Kenan, Jr., Chair in Political Science
LUTZ KOEPNICK, Gertrude Conaway Vanderbilt Chair in German
VERA M. KUTZINSKI, Martha Rivers Ingram Chair in English
JOHN LACHS, Centennial Professor in Philosophy
PETER LAKE, Martha Rivers Ingram University Distinguished Chair in History
JONATHAN LAMB, Andrew W. Mellon Chair in the Humanities
JANE G. LANDERS, Gertrude Conaway Vanderbilt Chair in History
DAVID E. LEWIS, William R. Kenan, Jr., Chair in Political Science
TONG LI, Gertrude Conaway Vanderbilt Chair in Economics
CRAIG W. LINDSLEY, University Professor in Chemistry
GORDON D. LOGAN, Centennial Professor in Psychology
WILLIAM LUIS, Gertrude Conaway Vanderbilt Chair in Spanish
LAWRENCE J. MARNETT, University Professor of Biochemistry, Chemistry, and Pharmacology; Mary Geddes Stahlman Chair
HOLLY McCAMMON, Cornelius Vanderbilt Chair in Sociology
RALPH MCKENZIE, Distinguished Professor in Mathematics
JOHN MCLEAN, Stevenson Chair in Chemistry
DOUGLAS G. MCMAHON, Stevenson Chair in Biological Sciences
JON MEACHAM, Carolyn T. and Robert M. Rogers Chair
JENS MEILER, Stevenson Chair in Chemistry
JONATHAN METZL, Frederick B. Rentschler II Chair in Sociology and Medicine, Health, and Society
LORRIE MOORE, Gertrude Conaway Vanderbilt Chair in English
KEVIN D. MURPHY, Andrew W. Mellon Chair in the Humanities
DANA NELSON, Gertrude Conaway Vanderbilt Chair in English
MOSES OCHONU, Cornelius Vanderbilt Chair in History
KELLY OLIVER, W. Alton Jones Chair in Philosophy
ALEXANDER OL'SHANSKIY, Centennial Professor in Mathematics
THOMAS J. PALMERI, Distinguished Professor of Psychology
SOKRATES T. PANTELIDES, University Distinguished Professor of Physics and Engineering; William A. and Nancy F. McMinn Chair in Physics
SOHEE PARK, Gertrude Conaway Vanderbilt Chair in Psychology
JAMES G. PATTON, Stevenson Chair in Biological Sciences
MATTIAS K. POLBORN, E. Bronson Ingram Chair in Economics
ANTONIS ROKAS, Cornelius Vanderbilt Chair in Biological Sciences
SANDRA J. ROSENTHAL, Jack and Pamela Egan Chair in Chemistry
PETER L. ROUSSEAU, Gertrude Conaway Vanderbilt Chair in Economics
EDWARD L. RUBIN, University Professor of Law and Political Science
KAMAL SAGGI, Frances and John Downing Family Chair
MARK SAPIR, Centennial Professor in Mathematics
JEFFREY D. SCHALL, E. Bronson Ingram Chair in Neuroscience
LARRY L. SCHUMAKER, Stevenson Chair in Mathematics
THOMAS A. SCHWARTZ, Distinguished Professor of History
TRACY D. SHARPLEY-WHITING, Gertrude Conaway Vanderbilt Chair in African American and Diaspora Studies and French
HELMUT W. SMITH, Martha Rivers Ingram Chair in History
HORTENSE J. SPILLERS, Gertrude Conaway Vanderbilt Chair in English

KEIVAN G. STASSUN, Stevenson Chair in Physics
TONY K. STEWART, Gertrude Conaway Vanderbilt Chair in the Humanities
GARY ALLEN SULIKOWSKI, Stevenson Chair in Chemistry
ROBERT B. TALISSE, W. Alton Jones Chair in Philosophy
CECELIA TICHI, Gertrude Conaway Vanderbilt Chair in English
FRANK TONG, Centennial Chair in Psychology
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DANIEL H. USNER, JR., Holland M. McTyeire Chair in History
W. KIP VISCUSI, University Distinguished Professor of Law, Economics,
and Management
DAVID J. WASSERSTEIN, Eugene Greener, Jr., Chair in Jewish Studies
JOHN A. WEYMARK, Gertrude Conaway Vanderbilt Chair in Economics
JOHN P. WIKSWO, JR., Gordon A. Cain University Chair in Physics;
A. B. Learned Chair in Living State Physics
RHONDA WILLIAMS, John L. Seigenthaler Jr. Chair in American History
ALAN WISEMAN, Cornelius Vanderbilt Chair in Political Science
DAVID CHARLES WOOD, W. Alton Jones Chair in Philosophy
DAVID W. WRIGHT, Stevenson Chair in Chemistry
EDWARD WRIGHT-RIOS, Mellon Foundation Chair in the Humanities
DAVID HAROLD ZALD, Cornelius Vanderbilt Chair in Psychology
ELIZABETH ZECHMEISTER, Cornelius Vanderbilt Chair in Political Science
MEL ZIEGLER, Paul E. Shwab Chair in Fine Arts
LAURENCE J. ZWIEBEL, Cornelius Vanderbilt Chair in Biological Sciences

Faculty

For a list of current faculty, please visit virg.vanderbilt.edu/webtools/registry.

Faculty Council

Jennifer Fay, Chair. Lucius Outlaw, Secretary. *Ex officio*: Dean of the College.

DIVISIONAL MEMBERS.

Terms expiring May 2020: Dietmar Bisch, Betsey Robinson,
Mariano Sana

Terms expiring May 2021: William Caferro, Larisa DeSantis,
Jennifer Fay, Doug Hardin, Mattias Polborn, Tariq Thachil

AT-LARGE MEMBERS.

Terms expiring May 2020: Paul Kramer, Lucius Outlaw,
Tiffany Patterson

Rosters for the following Arts and Science committees are available at as.vanderbilt.edu/faculty/committees.php.

ADMINISTRATIVE COMMITTEE

ADMISSIONS COMMITTEE

AXLE IMPLEMENTATION COMMITTEE

COMMITTEE ON ACADEMIC STANDARDS AND PROCEDURES

COMMITTEE ON EDUCATIONAL PROGRAMS

COMMITTEE ON GRADUATE EDUCATION

COMMITTEE ON HEALTH RELATED PROFESSIONS

COMMITTEE ON INDIVIDUAL PROGRAMS

COMMITTEE ON UNDERGRADUATE INTERDISCIPLINARY STUDIES

CURRICULUM COMMITTEE

SECOND LANGUAGE STUDY COMMITTEE

STUDENT-FACULTY RELATIONS COMMITTEE

STUDY ABROAD COMMITTEE

A Community for Liberal Learning

“The work of the College of Arts and Science is fundamental. It is the basis of all professional study. No professional school can be self-sufficient. The College in its undergraduate and graduate work must remain the heart of the whole situation, and send its quickening life blood into every fiber and tissue.”

—Chancellor James H. Kirkland
at the semicentennial celebration of the university
October 1925

CHANCELLOR Kirkland’s words were prophetic of our times as well as true of his own. Since its founding Vanderbilt has pursued its mission of excellence in the liberal arts with a commitment to liberal learning that is the special concern of the College of Arts and Science. Liberal learning endures because it brings men and women to subjects, concepts, and modes of thought that enable them to think critically about where humanity has been and where it ought to be going. The liberal arts spark curiosity and broaden vision, help to instill understanding of matters otherwise unknown, and encourage individuals to live their lives with a sense of purpose, context, and relatedness. A liberal education has perennial relevance and usefulness: it should prepare its recipients to think precisely, to reason clearly, and to judge wisely—all practical considerations in the pursuit of constructive and satisfying lives and in the practice of today’s professions and vocations.

Today the College of Arts and Science maintains its historic position as the heart of the university. Excellence in undergraduate and graduate education is its unwavering aim.

The College of Arts and Science provides intellectual stimulation, training, and incentive designed to foster the lifelong liberal learning of its graduates. It offers challenging, forward-looking programs of study in the humanities, natural sciences, and social sciences resourcefully taught by distinguished faculty recognized for excellence in research, scholarship, and creative expression. It promotes self-realization and expression in the context of social responsibility.

Faculty and Students

The College of Arts and Science derives its strength from the range of its academic offerings, from the quality of the faculty who teach, and from the quality of the students who come to learn. Traditionally fortunate in its ability to attract and retain a superior faculty, the College of Arts and Science has more than 500 full-time professors who supplement their achievements in the classroom with significant research, creativity, and writing. Many faculty members hold awards for distinguished scholarship and have been elected to high offices in their professional associations, including the Classical Association of the Middle West and South, the American Economics Association, the American Political Science Association, the American Philosophical Association, the American Physical Society, the American Historical Association, and the Biophysical Society.

The quality of the College’s faculty is matched by that of its diverse student body. Undergraduates come from the fifty states and fifteen to twenty foreign countries and are almost evenly divided between men and women.

Academic Support

The Writing Studio / Tutoring Services

The Writing Studio provides undergraduate students the opportunity to meet with trained writing consultants to discuss individual writing concerns, from invention to drafting to revision. The Writing Studio provides a space for students to discuss work-in-progress with expert writers, to create their own writing, and to utilize available resources for improving both writing and critical thinking skills.

The mission of the Vanderbilt Writing Studio is to enhance student writing and writing instruction, and to encourage regular conversation about the writing process. The Writing Studio’s extensive programming includes individual consultations, creative writing groups, workshops focused on specific issues in academic writing, open-mike readings, and student-run writers’ support groups.

The Writing Studio is located at 1801 Edgehill Avenue, Suite 112, and there is a satellite location in 217 Commons Center convenient to the first-year residence halls. The Writing Studio website can be accessed at vanderbilt.edu/writing.

One-on-one tutoring in many subjects is available through Tutoring Services, also located at 1801 Edgehill Avenue. Consultations in the Writing Studio and in Tutoring Services are free to all undergraduates.

Computers

The following locations are available for walk-in use of computers and software:

- Center for Second Language Studies (Furman Hall 001)
- Stevenson computer lab and lounge (Stevenson Center 2200)
- Wilson computer lab (Wilson Hall 120)

All of the college’s computer labs and classrooms offer a wide variety of “courseware” and commercial “productivity software,” including word processing packages. Color printing and scanners are available in most of the labs. In addition to accessing software on the local servers, students may also connect to both campus services and the internet, including VUGmail and e-resources in the libraries, as well as course materials in Brightspace. While use of the above facilities is free, printing is charged per page.

The computer classrooms in the Center for Second Language Studies and Wilson Hall are available for walk-in use during the late afternoon and evening hours. Stevenson Center lab and lounge are card-accessible weeknights until 1:00 a.m. All lab hours are posted by semester at as.vanderbilt.edu/vuit/computer_services/facilities/Labs.php. In addition to the college facilities, a few “kiosk” systems are available in the Sarratt Student Center. As a result, access to computers in the College of Arts and Science is extensive.

At last count, more than 98 percent of Vanderbilt students own a personal computer. Since all students also have a high-speed network connection, it is convenient for students to have their own system (please consult the ResNet guidelines for supported systems). However, most students will find that the college computing facilities provide all of the computing resources that are needed for success at Vanderbilt.

The Advising System

Entering first-year students are assigned advisers from CASPAR (College of Arts and Science Pre-major Academic Advising Resources Center). These “pre-major advisers” counsel students during their first three and one-half semesters, or until the students choose majors, when they are assigned faculty advisers in their major department or program. Pre-major advisers are specially trained to help students move efficiently through the requirements of AXLE (Achieving eXcellence in Liberal Education) and chart a course of study.

During the last two years of study, when a student is acquiring depth of knowledge in a major field, studies are guided by a specialist in that field. Students are encouraged to see their faculty advisers at any time, since the advisers are available for guidance and counseling and are faculty members with whom advisees may be studying.

All students are required to see their advisers prior to registration for each semester.

Advisers are generally happy to talk over any problems students may have, although their chief function is academic counseling. In addition, several members of the Dean’s Office of Undergraduate Education, themselves teaching faculty members, have as their principal duty counseling students and referring them to sources of expertise on non-academic problems.

Public Lectures

THE BERRY LECTURES. Established in 1988 through the generosity of Kendall and Allen Berry, John and Shirley Lachs, Steve Turner, and Jim Burke. Three annual lectures—the Berry lecture, the Steve Turner lecture, and the Jim Burke lecture—are given by distinguished philosophers.

THE LOUIS JACOB BIRCHER LECTURE IN CHEMISTRY. Established in 1976 in recognition of Professor Bircher’s forty-one years of service to Vanderbilt beginning in 1921. He served as the sole professor of physical chemistry until 1954, was chair of the Department of Chemistry from 1955 to 1961, and retired as professor emeritus in 1962. Family, colleagues, students, and friends of Professor Bircher have provided generous support for the series. The lecture is presented by a leading physical chemist.

THE BYRN HISTORY LECTURE. Established in 1986 and endowed by the late J. W. Byrn of Dickson, Tennessee, a student and admirer of the thought of the British historian Arnold Toynbee. Annual lectures deal with his fields of interest: world history, philosophy of history, and historiography.

THE FREDERICK LEROY CONOVER MEMORIAL LECTURE. First given in 1977 in honor of Vanderbilt’s first analytical chemist. Professor Conover came to Vanderbilt in 1923 and remained for thirty-seven years. Lectures given by a distinguished analytical chemist are supported by family, colleagues, students, and friends of Professor Conover.

THE WALTER CLYDE CURRY SHAKESPEARE LECTURE. Inaugurated in 1982 and funded by one of his former students, this lectureship honors the late Walter Clyde Curry, distinguished medieval and Renaissance scholar, author of books on Chaucer, Shakespeare, and Milton, and for forty years beloved professor of English at Vanderbilt. Bringing to campus in alternate years eminent Shakespearean scholars and experienced Shakespearean performers, the lectureship gratefully recognizes Professor Curry’s devoted service and lasting contributions to the university.

THE WAITE PHILIP FISHEL LECTURE. Established in 1974 as a tribute to Professor Fishel, who was known as an outstanding, popular teacher and was renowned for his research in metallurgy. Through the generosity of family, colleagues, students, and friends, the lecture is presented by a leading inorganic chemist.

THE HARRY C. HOWARD JR. LECTURESHIP. Established in 1994 at the Robert Penn Warren Center for the Humanities in honor of Harry C. Howard Jr. (B.A. 1951). The lectureship was endowed by Mr. and Mrs. Thomas Nash Jr. and Mr. and Mrs. George Renfro, all of Asheville, North Carolina, in honor of their longtime friend and attorney. The lectureship allows the Warren Center to bring an outstanding scholar to Vanderbilt annually to deliver a lecture on a significant topic in the humanities.

THE ARTHUR WILLIAM INGERSOLL MEMORIAL LECTURE. Established in 1973 to honor Arthur Ingersoll, professor of organic chemistry at Vanderbilt until his death in 1969. Each year contributions for this lecture are received from family, colleagues, students, and friends. A leading organic chemist is invited to present the lecture.

THE CARL K. SEYFERT LECTURE IN ASTRONOMY. Established in 1983 as part of the astronomy program’s commemoration of the thirtieth anniversary of the Arthur J. Dyer Observatory. The lectureship recognizes the untiring efforts and contributions to astronomy made by Carl K. Seyfert, professor of astronomy and first director of the Dyer Observatory. A distinguished astronomer is invited to present this lecture every third year.

THE SHANKS LECTURES. Established in 1984 and named for E. Baylis Shanks and Olivia H. Shanks in honor of their accomplishments in the fields of mathematics and education and in recognition of their loyalty and service to Vanderbilt University, these lectures are presented on two successive days in the fall of each year. A special committee from the Department of Mathematics, influenced by the professional interests of Professor and Mrs. Shanks, chooses the lecturers from mathematicians of the highest reputation. The topics of the lectureship vary from year to year according to the area of specialization of the speaker chosen. The lectures have been endowed by members of the family of Olivia and Baylis Shanks.

THE FRANCIS G. SLACK LECTURES IN PHYSICS. Established in 1977 by the Department of Physics and Astronomy in honor of Francis G. Slack, former Landon C. Garland professor of physics and chair of the department, these lectures recognize his many contributions to physics. The series was first partially endowed by his colleagues and students and then with the generous help of Professor Slack. Each speaker gives one lecture of general interest to the university and one more specialized lecture for the department.

THE DAVID STEINE LECTURE. Established in 1978 as a memorial to David Steine, professor of business administration in the Department of Economics and Business Administration, by members of his family, friends, and associates. The lecture is devoted to an economic problem of interest to the general public.

THE GERTRUDE VANDERBILT AND HAROLD S. VANDERBILT VISITING WRITERS PROGRAM. Established in the Department of English in 1958 under the generous sponsorship of the late Mrs. Vanderbilt, this program has annually presented readings and public lectures by a poet, a novelist, and a critic—each of whom also visits classes and meets informally with members of the university and Nashville communities. Recent participants have included Dannie Abse, Madison Smartt Bell, Ellen Gilchrist, Alison Lurie, Czeslaw Milosz, Wyatt Prunty, Ann Thwaite, Anthony Thwaite, and Helen Vendler.

Degree Program in the College

The Bachelor of Arts

The bachelor of arts degree is granted upon successful completion of the following five requirements:

1. At least 120 semester hours of creditable college work,
2. A final grade point average of at least 2.000,
3. Completion of the AXLE requirements,
4. Completion of one of the options listed under Area of Concentration,
5. Completion of at least 102 credit hours of course work within the College of Arts and Science, or a minimum of 90 credit hours for those students with a second major outside the College of Arts and Science.

Limitation on Credit Hours outside the College

Candidates for the bachelor of arts degree must successfully complete a minimum of 102 credit hours within the College of Arts and Science. Students who are completing an approved second major from one of the other schools within Vanderbilt are required to complete 90 credit hours within the College of Arts and Science for the bachelor of arts degree.

AXLE: Achieving eXcellence in Liberal Education

The Arts and Science core program of study—known as AXLE—is anchored in intensive practice in writing and a diverse thirteen-course component of classes that has been designed to allow maximum choice in course selection (based on student interests and achievement levels). At the same time, the distribution requirements of AXLE ensure that students will explore intellectually and academically the breadth of possibilities represented by the liberal arts.

What Is Liberal Education?

The study of the liberal arts—what is historically called a liberal education—is the oldest and most venerable form of higher education. It has proved itself perennially flexible and adaptive over the past centuries, and it remains the single best educational preparation for further, specialized study in the professions (medicine, law, education, business, et al.), as well as for doctoral work in the humanities and social sciences and advanced research in the sciences. The holistic focus of a liberal education encompasses all areas of human knowledge: the natural and social sciences, mathematics, foreign languages and cultures, the arts, and the humanities. The empirical disciplines guide us in our efforts to live most productively and efficiently. But the rest of the curriculum—the humanities and the arts—makes it possible to reflect upon the right use of the remarkable scientific knowledge we have acquired. In a liberal arts education, content is always considered in its larger context. Thus, the reflective and discursive aspects of study in the liberal arts call upon students to move beyond the mere acquisition of information to inquire into the deeper issues within their studies, and

to connect their learning across disciplines and cultures as they live and work in the communal environment of Vanderbilt. The end product of a successful liberal arts education is a thoughtful citizen who is prepared to take up his or her rights and responsibilities in a democratic society, to analyze and critique received information, to articulate the issues at hand or the personal values at stake, and whose intellectual life is marked by ongoing internal dialogue about the quality and meaning of life for him or her, as well as for the community at large.

Fear No Learning!

The interdisciplinary inclination of many courses in the College of Arts and Science is an ideal training ground for learning new methodologies for problem solving in the complex, global world of the 21st century. Here, students may work with biologists and psychologists in the Neuroscience program; study with creative writers, sociologists, historians, or cinema and media arts scholars in the African American and Diaspora Studies program; or take a class, team taught, by professors from the School of Music and the Department of English in the College of Arts and Science. Over the course of a Vanderbilt education, students challenge themselves with the academic demands of the classes they select, and are challenged by new ideas and unfamiliar ways of looking at issues. Exploring beyond the boundaries of one's intellectual comfort zone in order to admit new ideas is one of the most important aspects of higher education. The time and effort devoted to selecting thoughtfully the courses that will satisfy AXLE requirements prepare students for the more specialized study that they undertake in their major (or majors) beginning in the third year of study.

What Is AXLE?

AXLE is the acronym for Achieving eXcellence in Liberal Education. It is the core curriculum that all students in the College of Arts and Science must fulfill. The AXLE curriculum is flexible and very user-friendly. It consists of two parts: the Writing Requirement and the Liberal Arts Requirement.

The Writing Requirement has four segments: completion of English 1100 or demonstration of basic skills in English composition; completion of a First-Year Writing Seminar; completion of a writing course (indicated by a "W") no later than the fourth semester in residence; and completion of a second writing course (indicated by a "W") or an approved course in oral communication.

The Liberal Arts Requirement is composed of a total of thirteen courses taken at Vanderbilt, and distributed across six categories. The First-Year Writing Seminar and all writing courses, and approved Oral Communication courses are also counted in the thirteen-course Liberal Arts Requirement.

1. The Writing Requirement (three to four courses)
 - a. English Composition ENGL 1100 (appropriate test score or one course)
 - b. First-Year Writing Seminar (one course)
 - c. a W course before the end of the fourth semester (one course)
 - d. a second W course or approved Oral Communication course (one course)
2. The Liberal Arts Requirement (13 courses)
 - a. HCA — Humanities and the Creative Arts (three courses)
 - b. INT — International Cultures (three courses)
 - c. US — History and Culture of the United States (one course)
 - d. MNS — Mathematics and Natural Sciences (three courses)
 - e. SBS — Social and Behavioral Sciences (two courses)
 - f. P — Perspectives (one course)

All students must also complete requirements for at least one major (between 27 and 48 credit hours of course work) and earn a minimum number of 120 earned credit hours in order to graduate.

How to Get Started

The program of studies is divided approximately into thirds:

- 1/3 — courses to meet the requirements of the Writing and Liberal Arts requirements;
- 1/3 — courses required to complete the chosen major;
- 1/3 — electives, which will complete the 120 credit hours required for graduation.

These divisions are approximate and may differ for individual students.

For a student's first semester, most selections should be from the first group, courses that will fulfill the Writing and Liberal Arts requirements. Academic background, career goals, and general talents and interests will affect choice of courses.

Upon graduation, students in the College of Arts and Science will receive a bachelor of arts degree upon completion of the other four requirements in addition to AXLE: fulfillment of requirements for one major, a 2.000 average in the major, 120 cumulative earned credit hours, and a 2.000 average overall.

Where to Get Information

In addition to this catalog's sections on the rules, regulations, and policies of the College of Arts and Science as well as descriptions of the academic programs of all the undergraduate schools, students may refer to the booklet, *On the Road with AXLE*, a College of Arts and Science manual for entering students.

Where to Get Advice

Entering students are assigned pre-major advisers from CASPAR (College of Arts and Science Pre-major Academic Advising Resources Center). Pre-major advisers are carefully selected and receive intensive training on how to help students proceed effectively through the requirements of AXLE and chart a course of study. These advisers will counsel students through their first three and one-half semesters or until they

declare a major. At that time, students are assigned faculty advisers in their major departments. Students are encouraged to see their advisers at any time; they must, however, consult their pre-major adviser three times during the first year: during summer before the fall semester, prior to the opening of enrollment windows for the spring semester, and prior to the opening of enrollment windows for the fall semester of their second year. Prior to their first semester, entering first-year students must consult in June with their pre-major adviser who will assist with course selections for registration for the fall and begin to understand each student's interests and goals. (This initial contact is typically via phone and/or email.)

Overview of AXLE

AXLE consists of two parts: the Writing Requirement (including a First-Year Writing Seminar) and the Liberal Arts Requirement.

The First-Year Writing Seminar

The First-Year Writing Seminar is an integral part of the first-year experience in the College of Arts and Science. Through these seminars, first-year students engage in independent learning and inquiry in an environment in which they can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. The small-group nature of these seminars allows for direct student-faculty interaction that stresses training in techniques of scholarly inquiry. The students' written work and oral presentations are subject to thoughtful critical review by the faculty member, providing feedback that can be used to reconsider the manner in which they articulate their ideas and to refine their skills in these areas. Thus, first-year students learn not only about the subject matter of the seminar, but are also exposed to new methods of acquiring knowledge, different ways of expressing and sharing ideas, and unique opportunities to participate in critical inquiry.

All first-year students must enroll in a First-Year Writing Seminar. (First-Year Writing Seminars in the College of Arts and Science are numbered 1111.) This course may be taken during the fall or the spring semester. Students are permitted to enroll in only one First-Year Writing Seminar per semester. All First-Year Writing Seminars also count in their appropriate distribution areas within the Liberal Arts Requirement, but a second seminar will not count toward the writing requirement. Students who transfer into the College of Arts and Science (whether from another school at Vanderbilt or from another college or university) do not complete a First-Year Writing Seminar. Students beyond their second semester in residence may not register for First-Year Writing Seminars, nor may First-Year Writing Seminars be repeated after completion of the second semester in residence.

The Writing Requirement

Excellent communication skills, including the ability to articulate ideas and defend positions in writing, will be paramount for the 21st-century graduates of Vanderbilt University; therefore, all students in the College of Arts and Science must successfully complete the Writing Requirement.

a) All students must demonstrate competence in English composition. Appropriate skills in composition are essential to successful progress at the university. Competence is demonstrated by completion of ENGL 1100 or any of the following test-based or transfer-credit satisfiers:

i. SAT: Combined score of at least 1220 on the Writing and Critical Reasoning sections, with a minimum score of 500 on each (test taken prior to March 2016).

ii. SAT: Score of at least 660 on the Evidence-Based Reading and Writing section, with a minimum score of 27 on the Reading section and a minimum score of 28 on the Writing and Language section (test taken March 2016 or later).

iii. ACT: Score of at least 27 on the English portion combined with a minimum score of 7 on the Writing portion (test taken prior to September 2015).

iv. ACT: Score of at least 27 on the English portion combined with a minimum score of 19 on the Writing portion (test taken September 2015 or later).

v. ACT: Score of at least 30 on the English portion (beginning October 2016).

vi. AP: Minimum score of 4 on the English Language or English Literature exam.

vii. IB: Minimum score of 6 on the Higher level English exam.

viii. Transfer credit for English 1100

ix. Transfer credit for English 1210W, 1220W, 1230W, 1250W, 1260W, 1270W, or 1300W. (If used to satisfy the English composition requirement, the transfer credit does NOT also count as a 1000-level W course.)

b) First-Year Writing Seminar (see above).

c) All students must successfully complete at least one Arts and Science writing course (indicated by a “W”) at Vanderbilt University, regardless of AP or IB credits, SAT scores, or ACT scores earned prior to matriculation. The 1000-level writing-intensive courses emphasize general writing skills within the context of discipline-specific subject matter. The 2000 and higher-level writing-intensive courses foster advanced, discipline-specific writing skills. Departments or programs that offer these courses determine their specific writing content. In 2000 or higher-level W courses, continued attention to the process of writing is included in the classroom. Students receive regular feedback on their writing that will contribute toward enhancing writing skills appropriate to specific disciplines. The process of revising written work allows students to reflect on the writing process; writing tutorials may also be included. All students are required to complete a W course (other than ENGL 1100 or a First-Year Writing Seminar) **no later than the fourth semester**. All Arts and Science W courses also count in their appropriate distribution areas within the Liberal Arts Requirement.

d) All students must successfully complete either a second Arts and Science W course (other than ENGL 1100 or a First-Year Writing Seminar), or an approved course in oral communication at Vanderbilt University, regardless of AP or IB credits, SAT scores, or ACT scores earned prior to matriculation. Oral communication courses focus on developing improved public speaking skills. These courses introduce students to the principles and practices of public discourse and reasoned argument. Attention to the process of effective oral communication is integral to these classes. Students receive regular speaking assignments throughout the semester and regular feedback to enhance effective speaking skills. **All students must complete Part d of the Writing Requirement before graduation.**

The Liberal Arts Requirement

The Liberal Arts Requirement consists of successful completion of thirteen courses from the College of Arts and Science. Most courses in the College of Arts and Science fulfill one of these Liberal Arts requirements. Courses must carry three or more credits to count toward the AXLE Liberal Arts Requirement. Although some courses may be appropriate to more than one requirement, each course will fulfill only one requirement. These thirteen courses must be distributed as outlined below. They must be taken from at least seven departments or subject areas.

a) Humanities and the Creative Arts — HCA (3 courses)

Courses in the humanities and the creative arts challenge students to examine their personal understanding of life and how their individual experiences overlap with those of the rest of humankind. These courses testify to the varying ways in which people think, form values, confront ambiguity, express spiritual and aesthetic yearnings, and grapple with moral and ethical problems. By analyzing and interpreting literary, philosophical, religious, or artistic works, students examine the foundations of human experience. By producing original artistic works in imaginative writing, studio art, theatre, film, music, and dance, students have the opportunity to connect the universal sources of human inspiration with their own creative processes.

b) International Cultures — INT (3 courses)

The study of international culture provides students with a basis for understanding the diversity of experiences and values in our contemporary, global society. Options in this category include not only international history and cultural studies courses, but also courses in literature, cinema and media arts, the social sciences, art, music, and languages. Students may satisfy this requirement by choosing courses that focus on the history and culture of a single society or time period in human history and/or that represent a broad spectrum of different human societies and time periods.

Language courses introduce students to the language of a different culture and provide insight into that culture in ways that are not possible to achieve through detached study. At intermediate and advanced levels, students are able to explore the culture in depth, using the language itself to read, discuss, and write about its various aspects. Even at the most basic level, exposure to the language of a different culture prepares students to think and act in terms of living in a global community.

Intermediate and advanced language courses prepare students for study abroad programs, which the College of Arts and Science strongly recommends. A maximum of one course in this requirement may be satisfied through study abroad in a Vanderbilt-sponsored program, or in a pre-approved program offered through another provider. A summer study abroad program must earn 6 or more credit hours to satisfy this requirement.

The Global Education Office maintains a list of pre-approved programs.

Note: All students who study abroad must register their travel in advance with Vanderbilt's international security provider. Registration is completed on your behalf if you enroll in a program offered through the Global Education Office. Otherwise, information is available on the GlobalVU website: vanderbilt.edu/global.

Prior to 2018, course credit could be earned toward AXLE curriculum requirements by successfully completing study abroad courses through Vanderbilt in France or the Vanderbilt in Berlin summer program that have A&S numbers and titles. No other courses taken through other study abroad programs, including courses offered by Vanderbilt-approved programs and

including courses that are deemed to be direct equivalents to A&S courses, count toward AXLE curriculum requirements.

All students must complete three courses in this category, irrespective of previous language study or proficiency in a language other than English. At least one of the three courses presented in fulfillment of this category must be a second-semester (or higher) language acquisition class taught at Vanderbilt University (or through the Duke–UVa–Vanderbilt Partnership for Less Commonly Taught Languages), unless the student successfully demonstrates proficiency in a language other than English at or above the level achieved by second-semester language acquisition classes taught at Vanderbilt University. Students may demonstrate proficiency in a number of ways: SAT Subject Test scores (French, 540; German, 470; Hebrew, 530; Italian, 540; Japanese with Listening, 440; Latin, 530; Spanish, 520); by appropriate score on proficiency tests (written and oral) administered by the Tennessee Language Center; or with AP or IB credit in a foreign language. The first semester of an introductory language acquisition class in any language a student has studied for at least two years in high school, or in which a student transfers credit from another institution, cannot be used in partial fulfillment of this requirement. Intensive elementary language courses that cover the content of two semesters in one shall count as one course toward this category.

Students who, because of special ability and achievement, are admitted to the College of Arts and Science without the normally required two years of one foreign language in high school must enroll in a foreign language course during their first semester and must remain continuously enrolled until they successfully complete a full year of one foreign language. They must complete this requirement by the end of their fourth semester in the College of Arts and Science.

c) History and Culture of the United States — US (1 course)

The study of the history and culture of the United States provides students with a basis for understanding the American experience and the shaping of American values and viewpoints within the context of an increasingly global society. Interpreting history and culture in the broadest sense, options in this category include traditional history and cultural studies courses, but also courses in literature, cinema and media arts, the social sciences, art, and music, which illuminate historical periods or cultural themes in United States history. Students may satisfy this requirement by choosing a course that focuses on the history and culture of a single social group or time period in American history and/or that represents a broad spectrum of different social groups and time periods.

d) Mathematics and Natural Sciences — MNS (3 courses, one of which must be a laboratory science)

Courses in mathematics emphasize quantitative reasoning and prepare students to describe, manipulate, and evaluate complex or abstract ideas or arguments with precision. Skills in mathematical and quantitative reasoning provide essential foundations for the study of natural and social sciences. Students are generally introduced to mathematical reasoning through the study of introductory courses in calculus or probability and statistics.

Courses in the natural sciences engage students in hypothesis-driven quantitative reasoning that helps to explain natural phenomena, the roles of testing and replication of experimental results, and the processes through which scientific hypotheses and theories are developed, modified, or abandoned in the face of more complete evidence, or integrated into more general conceptual structures. Laboratory science

courses engage students in methods of experimental testing of hypotheses and analysis of data that are the hallmarks of the natural sciences. Natural science courses prepare students to understand the complex interactions between science, technology, and society; teach students to apply scientific principles to everyday experience; and develop the capacity to distinguish between science and what masquerades as science.

e) Social and Behavioral Sciences — SBS (2 courses)

Social scientists endeavor to study human behavior at the levels of individuals, their interactions with others, their societal structures, and their social institutions. The remarkable scope represented by these disciplines extends from studying the underpinnings of brain function to the dynamics of human social groups to the structures of political and economic institutions. The methods employed by social scientists are correspondingly broad, involving approaches as varied as mapping brain activity, discovering and charting ancient cultures, identifying the societal forces that shape individual and group behavior, and using mathematics to understand economic phenomena. By studying how humans and societies function, students will learn about individual and societal diversity, growth, and change.

f) Perspectives — P (1 course)

Courses in Perspectives give significant attention to individual and cultural diversity, multicultural interactions, sexual orientation, gender, racial, ethical, and religious issues within a culture across time or between cultures, thereby extending the principles and methods associated with the liberal arts to the broader circumstances in which students live. These courses emphasize the relationship of divergent ethics and moral values to contemporary social issues and global conflicts.

The Major

All students must successfully complete a course of study leading to one of the approved major programs in the College of Arts and Science, or successfully complete an individually designed interdisciplinary major designed in consultation with College of Arts and Science faculty and approved by the Committee on Individual Programs in the College of Arts and Science.

AXLE Curriculum Course Distribution

The distribution of Arts and Science courses into AXLE categories is available in YES. Using the advanced-class-search dialog box, use the pull-down menu under “Class Attributes” to select an AXLE category.

AXLE, the Major, and the Optional Minor

Courses used to satisfy requirements of AXLE may also be used to satisfy requirements of the major or the optional minor.

Advanced Placement under AXLE

With the exception of basic English composition and the foreign language proficiency requirements, no AXLE requirement may be fulfilled with any form of advanced placement credit (AP, IB, A-level, etc.).

Transfer Credit under AXLE

Generally, only courses taken in the College of Arts and Science may be used toward AXLE; however, any college course credit earned **prior** to graduation from high school, and

transfer credit earned **before** admission to Vanderbilt, may be used toward fulfilling AXLE requirements.

Area of Concentration

During the junior and senior years, much of the student's work is concentrated in one large unit of intellectually related courses. The program of concentration may be arranged through a single major, an interdisciplinary major, or a double major. Each of the three options is described below. A triple major may be declared with the approval of the Administrative Committee.

Major Field

Under this plan, the student majors in one of the recognized fields. There shall not be fewer than 27 credit hours in the major field, but a given department may require up to 48 credit hours. Students may take more than the required number of credit hours in any major; any given department, however, may limit the total permissible credit hours in a discipline.

For graduation, a student must have achieved a grade point average of at least 2.000 in all classes taken in the major. This set of courses includes all courses a student takes in the department or program of the major and all courses a student takes outside the department or program that may count toward the major. All courses that are listed as fulfilling credit hours required for the major, as listed in the *Undergraduate Catalog*, are included in calculating the grade point average in the major.

Within the framework of these general requirements, each department has its own policies governing major work, which are published elsewhere in this catalog or otherwise available to students.

Academic programs of the College of Arts and Science are varied and broad in scope, with departmental majors offered in the following fields:

African American and Diaspora Studies	History
Anthropology	History of Art
Art	Law, History, and Society
Biological Sciences	Mathematics
Chemistry	Molecular and Cellular Biology
Communication Studies	Philosophy
Earth and Environmental Sciences	Physics
Ecology, Evolution, and Organismal Biology	Political Science
Economics	Psychology
English	Religious Studies
Environmental Sociology	Russian Studies
French	Sociology
German Studies	Spanish
	Spanish and Portuguese
	Theatre

Defined Interdisciplinary Programs

Students may also major in defined interdisciplinary programs (listed below). There shall not be fewer than 27 credit hours in the major field, but a given program may require up to 48 credit hours. The student must achieve at least a 2.000 grade point average in all work taken in the major.

American Studies
Asian Studies
Biochemistry and Chemical Biology
Cinema and Media Arts
Classical and Mediterranean Studies
Communication of Science and Technology
Economics and History
European Studies
European Studies: Russia and Eastern Europe
French and European Studies
German and European Studies
Italian and European Studies
Jewish Studies
Latin American Studies
Latino and Latina Studies
Medicine, Health, and Society
Neuroscience
Public Policy Studies
Spanish and European Studies
Women's and Gender Studies

Students may combine an interdisciplinary major with a major in one of the recognized fields listed at the beginning of this chapter.

Declaration of the Area of Concentration

Students may formally declare a major at any time during the third semester of residence and must do so no later than the Friday before Spring Break of the fourth semester. The student selects a department or interdisciplinary program and applies to that department or program for assignment to an adviser. Students who wish to develop an individually designed interdisciplinary program apply to the associate dean who chairs the Committee on Individual Programs.

Each fall a program is arranged that provides for consultation of sophomores with department chairs, for the purpose of helping students select a major. Sophomore students who have not declared a major should participate in this program if they intend to attain junior standing before the next spring.

The selection of a major is of considerable importance, and the entire program of concentration for the junior and senior years should be planned with the major adviser before the beginning of the junior year. Students officially declare their majors by registering with the chosen department(s) or interdisciplinary program(s), and with the Dean's Office of Undergraduate Education in Arts and Science. When the student's major has been registered, access to the student's academic record is transferred from the pre-major adviser to the new major adviser.

Students may not add a major(s) past the fifth class day of the first semester of the senior year.

Individually Designed Interdisciplinary Majors

This plan permits students to contract for an individually designed program of concentration consisting of at least 48 credit hours of approved work. The program is constructed around a coherent academic purpose and may draw together the academic resources of a number of departments and schools. The program's purpose may include topical, period, or area studies, and must be consistent with the philosophy underlying a liberal arts education (see "What is Liberal Education?" on page 54 of this catalog). The program should not be designed with a focus on pre-professional training (e.g., pre-business, pre-law, or pre-medicine). The student may be required to achieve

a standard of proficiency in appropriately related areas such as foreign languages or mathematics in addition to the 48 credit hours constituting the program of concentration.

Each student must identify a major adviser who will offer advice and guidance. The major adviser must be a professor or full-time senior lecturer in the College of Arts and Science.

The student's plan for an individually designed interdisciplinary major is a statement of required courses. Furthermore, because of the nature of interdisciplinary majors, all courses that have previously been included in the student's plan are considered to be part of the major discipline. The student must achieve at least a 2.000 grade point average in all courses that are (or have been) part of the plan.

Normally, no more than three introductory-level courses will be counted toward the interdisciplinary major.

Students may not add a major(s) past the fifth class day of the first semester of the senior year.

Double and Triple Majors

This program permits a student to concentrate in two or three fields, which may or may not be intellectually related. With approval of the departments concerned, the student completes all of the requirements stipulated for the majors. Triple majors require approval of the Administrative Committee.

Each A&S major must include at least 24 credit hours that are being counted solely toward the major. This rule also applies to students who combine (in a double or triple major) a non-interdisciplinary major with an interdisciplinary major.

Approved Second Majors Outside the College

All undergraduate courses, majors, and minors offered by Blair School of Music, School of Engineering, and Peabody College are approved for students in the College of Arts and Science. See the appropriate sections of the *Undergraduate Catalog* under each school for details. Arts and Science students with a second major from another Vanderbilt undergraduate school must earn a minimum of 90 credit hours in Arts and Science. Consultation with the student's Arts and Science major adviser is especially important.

Approved 2019/2020
Undergraduate School Catalog

Additional Programs

For information on the College Scholars program and departmental honors, please see the chapter titled Honors.

The Optional Minor

A minor is a program within a recognized area of knowledge offering students more than a casual introduction to the area but less than a major in it. Although the completion of a minor is not a degree requirement, students may elect to complete the courses specified for one or more minors. A student who completes all designated courses in a minor with a grade point average of at least 2.000 will have the minor entered on the transcript at the time of graduation.

Minors may be combined with any departmental major or interdisciplinary major, but minors may not be earned in the department or program of the major. Each minor must, however, include at least 15 credit hours that are being counted solely toward the minor. Courses may not be taken on a P/F basis if they are offered in the department of the minor or if they are being counted toward an interdisciplinary minor (see Academic Regulations).

Minors consist of a minimum of five courses of 3 or more credit hours each. Many minors require a greater number of credit hours and specific courses. When a minor is offered in a discipline that offers a major, only those courses that count toward the major may be counted toward the minor.

Students should refer to the appropriate sections of this catalog for specific requirements. Minors available at present are listed below.

Students should declare their intention to pursue specific minors by completing forms available in the Dean's Office of Undergraduate Education as well as the various departmental and program offices. Departments and programs assign advisers to students who declare minors in their respective areas. Students have the responsibility to know and satisfy all requirements for minors that they intend to complete.

Students may not add or change a minor after the final day of classes in the second semester of their senior year.

Optional minors are offered in the following fields and interdisciplinary programs:

African American and Diaspora Studies	Economics English
American Studies	Environmental and Sustainability Studies
Anthropology	European Studies
Arabic Language Art	French
Asian Studies	German Studies
Astronomy	History
Biological Sciences	History of Architecture
Brazilian Studies	History of Art
Chemistry	Islamic Studies
Chinese Language and Culture	Italian Studies
Cinema and Media Arts	Japanese Language and Culture
Communication of Science and Technology	Jewish Studies
Communication Studies	Korean Language and Culture
Earth and Environmental Sciences	Latin American Studies
	Latino and Latina Studies

Managerial Studies:* Corporate Strategy Financial Economics	Portuguese Psychology Religious Studies
Mathematics	Russian
Medicine, Health, and Society	Scientific Computing**
Mediterranean Archaeology	Sociology
Mediterranean Studies	South Asian Language and Culture
Nanoscience and Nanotechnology**	Spanish Theatre
Neuroscience	Undergraduate Business Minor ^
Philosophy	Women's and Gender Studies
Physics	
Political Science	

*For students matriculating prior to Fall 2016

**Administered by the School of Engineering in collaboration with the College of Arts and Science

^Administered by the four undergraduate schools and the Owen Graduate School of Management

Approved Minors Outside the College

Arts and Science students are permitted to pursue a second major and/or a minor that has been approved by the faculties of the other Vanderbilt undergraduate schools: the Blair School of Music, the School of Engineering, and Peabody College of Education and Human Development. See the appropriate sections of the *Undergraduate Catalog* under each school for details. Minors may not be earned in the department or program of the major.

Undergraduate Research

All students have ample opportunity to participate in faculty research projects or to pursue research projects independently, both on campus and at remote sites. Such research has led to the publication of coauthored or student-authored papers and other presentations to the scholarly community. Summer and academic year research by undergraduates in all fields may be subsidized by the university or the College of Arts and Science. Students should contact the director of undergraduate studies in the field of interest for more information.

Study Abroad Programs

Vanderbilt offers study programs for all undergraduate students from Arts and Science, Blair School of Music, School of Engineering, and Peabody College to provide undergraduates immediate contact with cultures different from their own and to aid in the mastery of foreign languages. Students interested in applying for study abroad should consult their advisers to determine whether all degree requirements can be completed on schedule.

Brochures on all approved programs are available in the Global Education Office in Room 115, Student Life Center. GEO also maintains a website, vanderbilt.edu/geo. The study abroad programs are described in more detail in the chapter on Special Programs for Undergraduates in the front section of this catalog.

When choosing programs in a city for study abroad, College of Arts and Science students may only apply to the Vanderbilt-approved overseas program(s) in that city.

There are four cities/programs for which this rule does NOT apply because of the specificity of the course of study on the Vanderbilt programs: Institut d'Etudes Politiques in Paris, France (designed for social science majors with a high degree of French proficiency); St. Charles University in Prague, Czech Republic (designed for Jewish studies majors); Classical Studies in Rome, Italy (open ONLY to classical studies majors); and Vienna, Austria (open ONLY to Blair students). That is, Arts and Science students who wish to study in Paris, Prague, Rome, or Vienna may choose to study in a program that is not Vanderbilt-approved.

Additional Options

Students interested in receiving transfer credit for Vanderbilt-approved study abroad programs through other universities should apply to the Committee on Individual Programs. They must meet the same academic standards required for participation in Vanderbilt's study abroad programs. Information is available from the Dean's Office of Undergraduate Education (350 Buttrick Hall).

It should be noted, however, that if a program has been approved for direct credit by Vanderbilt, it must be taken as the approved direct-credit program by matriculated Vanderbilt students. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved direct-credit program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt.

Pre-Professional Studies

Medicine

Students interested in the study of medicine should plan their undergraduate programs in consultation with Professor Michelle Grundy, health professions adviser. There is no formal premedical program of courses in the College of Arts and Science or elsewhere at Vanderbilt. Each student should plan a program to meet individual needs. The program should include whatever courses may be necessary to meet medical school admission requirements, all courses required for the major, all AXLE requirements, and elective options. Students may choose majors from any of the four undergraduate colleges, and may elect to pursue a double major or an interdisciplinary program of concentration.

A student who plans to apply for admission to the Vanderbilt University School of Medicine, as well as other medical schools, may choose either of the following options:

1. A student may qualify for admission with a B.A. degree, whether completed in three years or in four. Minimum requirements for admission generally would be met by completing at least two semesters of English, four semesters of chemistry including organic, two semesters of biology, two semesters of physics, and at least one semester of calculus/math. Since prerequisites may vary across medical schools, students are urged to consult the online resource, *Medical School Admission Requirements* (MSAR) published by the American Association of Medical Schools (at aamc.org) for school-specific information.

In light of the Medical College Admissions Test (MCAT) changes that took effect in 2015, it is recommended that students take one semester of biochemistry and one semester of introductory statistics. Additionally, through course work or self-directed study, students will need to be knowledgeable in basic concepts of psychology, sociology, and bioethics.

For more information, students are advised to visit the website of the Health Professions Advisory Office (vanderbilt.edu/hpao) and refer to the links for 1) "Premedical Preparation" and 2) "Threading a path through premedical expectations."

2. A student may qualify as a three-year student in the senior-in-absentia program (see Senior-in-Absentia in this catalog).

Dentistry

Students interested in pre-dental studies should plan their undergraduate program in consultation with Professor Michelle Grundy, health professions adviser. There is no formal pre-dental program of courses at Vanderbilt. Pre-dental studies should include courses necessary to meet dental school admission requirements, all courses required for the major, all AXLE requirements, and elective options. Students may choose majors from any of the four undergraduate colleges. They may also elect a double major or an interdisciplinary program of concentration. A student may apply to dental school under the senior-in-absentia program (see Senior-in-Absentia in this catalog) or apply for admission after three years of college work without a degree.

Any student contemplating application to dental school should take at least two semesters of English, four semesters of chemistry including organic, two semesters of biology, two semesters of physics, and at least one semester of calculus/math. Since prerequisites may vary across dental schools, students are urged to consult the *ADEA Official Guide to Dental Schools* published by the American Association of Dental Schools.

Nursing

Students interested in developing a program that could lead to a master of science in nursing are advised to consult the Office of Admissions in the School of Nursing.

Architecture

Undergraduate students in the College of Arts and Science expecting to pursue architecture at the graduate level should complete at least one year of analytic geometry and calculus and one year of physics. Students may select any major but would want to include courses that emphasize a broad sense of art and architectural history, including courses in studio art. Before applying to specific schools of architecture, they would develop a portfolio of creative work. Further information is available from the pre-architecture advisers: Professor Vesna Pavlović, Department of Art, and Professor Kevin Murphy, Department of the History of Art.

Engineering

Undergraduate students in the College of Arts and Science expecting to pursue engineering at the graduate level should normally major in a natural science or mathematics and, at a minimum, should complete two years of calculus or its equivalent, one year each of chemistry and physics, and at least an additional year of a natural science or mathematics. A

minimum of one year of computer science is highly desirable. Students should seek specific information concerning admission from the engineering school of their choice as early as possible, preferably by the end of the sophomore year, to assure optimum preparation for entry into that school. Standards for admission vary, but usually a 3.00 average or better is required.

Law

There is no formal program of prelaw studies at Vanderbilt. Most law schools have no specific requirements for a prelaw curriculum but place great emphasis on the development of the student's ability to read and comprehend accurately, thoroughly, and rapidly; to speak and write clearly and correctly; to think precisely; and to analyze complex situations and weigh and appraise their several elements. The development of analytical skills and of mature study habits is vital. A broad cultural background is important—since law touches life at every point, every subject in the college curriculum may bear on the lawyer's work. Students interested in the study of law should plan their undergraduate programs in consultation with Professor Carrie Russell, prelaw adviser, in the Department of Political Science.

Management

Dual Five-Year Baccalaureate–M.B.A. Program. By combining one and one-half years of study in the Vanderbilt Owen Graduate School of Management with three and one-half years in Vanderbilt's College of Arts and Science, students may obtain both the baccalaureate degree and the M.B.A. degree in five years—the baccalaureate from the College of Arts and Science at the end of the fourth year under the senior-in-absentia program, and the M.B.A. from the Owen School after the fifth.

Students may major in any subject in the College of Arts and Science.

Students must apply to the Owen School for admission to the five-year program during their junior year and to the Administrative Committee of the College of Arts and Science for acceptance into the senior-in-absentia program. Students are subject to normal Owen School admission requirements, and no student is assured of admission to the Owen School. Students who are accepted will be registered in the Owen School for three semesters (a minimum of 48 credit hours). Up to 16 credit hours of Owen School courses approved by the College of Arts and Science may be counted toward completion of the undergraduate degree. Upon acceptance to the Owen School, students should contact the Office of Student Services for an advising appointment. The Owen School registrar will review undergraduate courses and arrange for transfer of those credit hours toward the student's M.B.A. degree.

Financial Aid. The scholarship or other financial aid commitment of the College of Arts and Science will not be continued automatically beyond the seventh semester for students enrolled in the dual program. Eighth semester scholarships or other financial aid are the responsibility of the Owen School. The Owen School will advise students of the level of financial support, if any, prior to their enrollment in the dual program, to be provided during the eighth and subsequent semesters. This ensures that an eighth semester scholarship from the College of Arts and Science is protected for the student until a final decision is made to enroll in the Owen School.

Planning for the Program. Students interested in this program should consult the director of undergraduate studies

in the Department of Economics, or the Owen Admissions Office, for advice on planning undergraduate studies to meet the program's requirements.

Teacher Education

Details will be found in Licensure for Teaching in the Peabody College section of this catalog.

Internships

Students may earn academic credit for the work of internships in the College of Arts and Science on a Pass/Fail basis through interdisciplinary or departmental internships. Credit hours earned will not count toward major or minor requirements or toward AXLE, but will count as part of the total credit hours required for graduation. Students obtain their own placement and faculty adviser who works with them to develop a list of readings or research agenda for the internship, which must be approved by the director of internships in the College of Arts and Science (Associate Dean Yollette Jones). The necessary forms for earning academic credit for an internship may be obtained from the Dean's Office of Undergraduate Education in 350 Buttrick Hall, although students register for internships through their respective school. The deadline for submitting registration forms to the office of Dean Jones for internship courses taken during summer term and fall semester is May 1. Students expecting to intern during the spring semester should submit registration forms by January 1.

Finding an Internship

Students searching for an internship opportunity locally or elsewhere should contact the Career Center.

Interdisciplinary Internships

INDS 3880 (fall, spring), 3884 (summer). 1 credit hour (repeatable)

Any student who is at least a sophomore and in good academic standing may earn one credit hour per semester or summer for an internship under this designation. This course may be repeated twice for a maximum of 3 credit hours exclusively on a Pass/Fail basis.

Departmental Internships

Maximum of 15 credit hours (may be taken only once)

Under this option students from any discipline may earn academic credit for internships in the departments listed below if they meet the minimum GPA requirements and have 6 credit hours of prior work in the department in which they wish to intern. Students are responsible for securing a faculty adviser for the internship and developing an academic plan of work for the internship opportunity, both of which must be approved by the director of undergraduate studies in the department in which the internship is housed. (In some instances, the DUS will serve as the faculty adviser for all internships taken in that discipline.) All internships under this designation are taken concurrently with a research and/or readings course. The latter is taken on a graded basis and may count toward requirements for a major or minor. Students should consult the director of undergraduate studies in the department of interest to obtain additional information about internships in that discipline. The following departments offer

up to 15 credit hours of academic credit per semester or summer for the following courses (internship courses are offered during FALL, SPRING, and SUMMER sessions):

AADS 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

AMER 3880–3881. 3880: Internship Training [1–6], 3881: Internship Readings and Research [3–6].

ANTH 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [1–6].

CMA 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [1–6].

FREN 3880–3881. 3880: Internship Training in France [1], 3881: Internship Readings and Research in France [3].

HART 3880, 3883. 3880: Internship Training [1–9], 3883: Internship Research [1–3].

HIST 3880, 3882–3883. 3880: Internship Training [3–9], 3882: Internship Readings [3], 3883: Internship Research [3].

JS 3880, 3883. 3880: Internship Training [1–3], 3883: Internship Research [3].

LAS 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

MHS 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [1–6].

PSCI 3880, 3882–3883. 3880: Internship Training [1–9], 3882: Internship Readings [1–3], 3883: Internship Research [1–3].

RUSS 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

SOC 3880–3881. 3880: Internship Training [1–9], 3881: Internship Readings and Research [3–6].

SPAN 3880–3881. 3880: Internship Training in Spain [1], 3881: Internship Readings and Research in Spain [3].

WGS 3880, 3882–3883. 3880: Internship Training [1–9], 3882: Internship Readings [1–3], 3883: Internship Research [1–3].

More complete information regarding departmental internship courses may be found in the course descriptions in this catalog. (Courses which have been approved recently by the faculty may not appear in the most recent edition of the catalog.)

Cost of an Internship

Internships taken during the fall or spring semester will fall under the normal tuition charge unless the student falls below 12 or exceeds 18 credit hours during the semester. In both instances, the hourly tuition charge will apply with permission for an underload/overload from the appropriate academic dean. Students will be charged for internships taken during summer on the basis of the hourly tuition rate for summer school unless approved in advance to receive the internship subsidy (see the Career Center website).

Combined B.A./M.A. (4+1) Program

The College of Arts and Science offers students in many departments and programs the opportunity to earn both the bachelor's degree and the master's degree in a shorter period of time and at less cost than is normally the case. Exceptional students in the College of Arts and Science can obtain both degrees in an expedited period, typically within but not less than five years.

The usual period of study for both the bachelor's and the master's degree is six years. Through the 4+1 option, the student and her or his adviser plan a five-year program of study. It is important to note that there is no provision for obtaining both degrees in a period shorter than five years. The program is intended for selected students for whom the master's degree is sufficient preparation for their career goals, is desirable as a goal in itself, or is viewed as additional preparation before pursuing a doctorate or a professional degree.

The areas of study available for the Combined B.A./M.A. (4+1) option within Arts and Science are determined by individual departments and programs, who also determine the policies and guidelines to be followed. Students will be admitted to the Combined B.A./M.A. program only by the invitation and the approval of the department or program.

Programs of Study

The 4+1 option is currently available in the following departments and programs: English; French; German; history; history of art; Latin American studies; mathematics; medicine, health, and society; philosophy; political science; and psychology. Students are welcome to discuss the Combined B.A./M.A. (4+1) option with any of these departments and programs.

Admissions Overview

The Combined B.A./M.A. program allows Vanderbilt University students to study for both degrees typically, but not necessarily, in the same department. Undergraduates with strong academic records may apply for admission to the program after the first semester of their junior year. Qualifying students are normally accepted into the program in the second semester of the junior year.

To apply for admission, students will first consult with the Dean's Office of Undergraduate Education (350 Buttrick Hall), and then submit to the prospective graduate department or program a "Petition to Apply to the Combined B.A./M.A. (4+1) Degree Program" (available at as.vanderbilt.edu/academics/specialdegree/4plus1.php), a statement of purpose, a formal application to the Graduate School, a preliminary program proposal, two letters of recommendation from Vanderbilt faculty, and a current transcript. Application forms are available for download or can be completed online at vanderbilt.edu/gradschool. GRE scores or other admissions requirements may be specified by the prospective department. Admission to the 4+1 option is highly selective. An accomplished academic record, a demonstrated commitment to pursue graduate study, and a strong endorsement from Vanderbilt faculty are key elements to the successful applicant. Students will be provisionally accepted as graduate students, pending completion of all undergraduate requirements. Graduate student status will apply in the fifth year.

Advising

Prospective students should discuss with one of their advisers general information on the program and how this program is appropriate to their long-term goals. All students are encouraged to discuss their plans and goals with their undergraduate pre-major and major adviser. Especially in those cases where the intended graduate program differs from the undergraduate major, the student is further encouraged to seek advice from the advisers in the graduate program, too.

Curriculum

Students in a 4+1 program must satisfy all requirements for both degrees. Advanced Placement (AP) credits will often be used toward satisfying general curriculum requirements, for a maximum of 18 credit hours. The principal distinction between this program and the standard graduate program is two-fold: (1) students are allowed to take master's courses while completing the bachelor's degree, and (2) students are thereby enabled to complete both degrees within five years.

In order to complete the program in five years, students will be expected to complete most, if not all, of the requirements for their undergraduate degree by the end of the first semester of the senior year. Until all baccalaureate requirements are fulfilled, the student will follow College of Arts and Science undergraduate policies and procedures. It is also suggested that students begin taking graduate courses toward the master's degree in the second semester of the senior year. Most graduate programs participating in this option have a non-thesis plan of study requiring 30 graduate credit hours in addition to the requirements for the undergraduate degree. An average load per semester as a graduate student is 9–12 credit hours.

Scholarships and Financial Aid

Students who are receiving scholarships or other forms of financial aid as a Vanderbilt undergraduate are advised that such aid applies in most cases only toward the completion of the bachelor's degree or the first four years of their studies (which may include their taking some graduate courses during their senior year). Students wishing to pursue the 4+1 option should seek support for their fifth year of study through student loans and other financial aid.

For additional information, contact A&S Deans' Office, 350 Buttrick Hall, or consult the website <https://as.vanderbilt.edu/academics/specialdegree/4plus1.php>.

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Undergraduate School Catalog

Honors

Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the Dean after consideration of faculty recommendations and overall academic achievements, as well as grade point averages of the year's highest ranking summa cum laude graduates.

Latin Honors Designation

Honors noted on diplomas and published in the Commencement program are earned as follows:

Summa Cum Laude. Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's graduating seniors.

Magna Cum Laude. Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's graduating seniors.

Cum Laude. Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's graduating seniors.

Graduates who complete the requirements of the College Scholars program are awarded "Honors in the College of Arts and Science," and this designation appears on their diplomas. Candidates successfully completing departmental honors programs are awarded honors or highest honors in their major field, and this designation appears on their diploma.

College Scholars Program

Entering first-year students with outstanding academic records and students who achieve academic distinction during their first semester at Vanderbilt are invited to participate in the College Scholars program. These students have the exclusive opportunity to pursue advanced scholarly work in honors seminars and enriched courses or independent-studies projects. They may earn the designation "Honors in the College of Arts and Science" on their diplomas.

To earn the designation, College Scholars must accumulate fifteen "honors points" by achieving the grade *B* or better in approved courses and projects. A maximum of thirteen of these honors points may be earned in honors seminars. Honors seminars in the humanities, natural sciences, and the social sciences serve toward satisfaction of AXLE requirements in these areas. For a complete description of how honors points may be earned and a listing of honors seminars offered, see the entry on Honors in alphabetical order under Courses of Study.

College Scholars are not required—although many will choose—to earn honors in the College of Arts and Science; all, however, may enroll in as many honors seminars as they want. To remain in good standing in the program, students must maintain a minimum grade point average of 3.000. Further information on the College Scholars program and honors in the College of Arts and Science may be obtained from Associate Dean Dan Morgan.

Departmental Honors

To encourage individual development and independent study in a special field of interest, many departments and interdisciplinary programs of the College of Arts and Science offer honors programs for selected, superior candidates. Students normally begin departmental honors work in the junior year, but exceptions may be made in the case of outstanding seniors. To qualify for consideration, students must have (a) attained a minimum grade point average of 3.300 in all work previously taken for credit and in the major, and (b) exhibited to the department(s) and/or interdisciplinary program(s) other evidence of the student's capacity for independent study. Some departments and interdisciplinary programs require higher grade point averages in all work previously taken for credit and/or in the major. Formal admission is by the director of honors study in the Dean's Office of Undergraduate Education after election by the department(s) and/or interdisciplinary program(s) concerned.

Requirements vary somewhat from department to department (see descriptions in the appropriate department sections of this catalog). Candidates are required to demonstrate some degree of originality and maturity in the methods of independent investigation, analysis, and criticism, and skill in the written presentation of independent work. This standard usually requires a senior thesis but may be satisfied, in departments that have gained approval of this procedure, by a series of briefer critical papers.

Departmental honors work culminates in an examination given in the second semester of the senior year. The examination shall be both oral and written except in departments where honors students must take all courses required of standard majors in addition to those required of honors students. These departments have the option of making the examination either oral or both oral and written. The examination shall be conducted by a committee with a majority of examiners who have not participated in the candidate's honors work. Where feasible, examiners from other institutions may be included. The examination shall cover the thesis and specific fields of the independent work and may, at the discretion of the department, include all of the major work. Successful candidates are awarded honors or highest honors in their field, and this designation appears on their diplomas.

Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded credit hours, with no temporary or missing grades in any course (credit or non-credit), and no grade of *F*. A student must be in a degree-granting school.

Phi Beta Kappa

The Alpha Chapter of Phi Beta Kappa in the state of Tennessee honors scholarly attainments in the liberal arts and sciences and annually elects seniors and juniors to membership during the spring semester.

Seniors who have completed at least 60 credit hours in the College of Arts and Science and earned a cumulative grade point average of 3.65 or higher are eligible for consideration,

as are juniors who have completed at least 70 credit hours at Vanderbilt with a cumulative grade point average of at least 3.90. Juniors must have completed most AXLE requirements by the end of their junior year. For calculating credit hours and judging residence requirements, the chapter treats foreign study programs in the same manner as does the College of Arts and Science.

Attainment of the minimum required grade point average does not guarantee election. Membership in Phi Beta Kappa is based on a demonstration of scholarly achievements, broad cultural interests, and high moral character. The scholarly work must emphasize liberal rather than applied or professional studies. As a guideline, for seniors at least 90 credit hours must qualify as liberal. Grades earned in applied (vocational) or professional course work are not counted in computing the grade point average. The breadth of a candidate's program, as shown by the number and variety of courses taken outside the major, is also considered.

Phi Beta Kappa has long emphasized the importance of mathematics and foreign language in a liberal education. In keeping with this tradition, the chapter considers only those students who have demonstrated proficiency in these areas beyond the AXLE graduation requirements. Proficiency in reading, writing, and speaking a foreign language is typically demonstrated by passing a course in a language at a level at least one semester beyond the AXLE requirements. Courses must be taken on a graded rather than a P/F basis. The foreign language requirement may be satisfied with College Board SAT Subject, Advanced Placement, International Baccalaureate, or Tennessee Language Center test scores.

Mathematics proficiency may be demonstrated by completing two semesters of calculus or one semester of calculus and one semester of statistics. Courses must be taken on a graded rather than a P/F basis. The mathematics requirement may be satisfied with Advanced Placement, International Baccalaureate, or A-Level exam credit, but not College Board SAT Subject test scores.

In no event may the total number of persons elected from any senior class exceed 10 percent of the class, and from any junior class exceed six persons. Eligible juniors who are not elected are reconsidered for membership in their senior year.

Refer to the chapter website my.vanderbilt.edu/phiбетakappa for additional information and detailed eligibility criteria.

Honor Societies for First-Year Students

First-year students who earn a grade point average of 3.500 or better for their first semester are eligible for membership in the Vanderbilt chapters of Phi Eta Sigma and Alpha Lambda Delta.

Other Awards and Prizes

MORRIS H. BERNSTEIN JR. PRIZE IN LATIN DECLAMATION. Established in 1983 by William H. Bernstein (B.A. 1983) in memory of his father (B.A. 1943, M.D. 1946). Awarded after a competition, open to any undergraduate who has studied two semesters of Latin, in which participants deliver from memory Latin passages selected to reflect classical ideals.

FOUNDER'S MEDAL FOR ORATORY. Awarded to the senior who has demonstrated the highest standard in public speaking.

FRENCH GOVERNMENT PRIZES. Awarded for excellence in French studies.

EDWIN S. GARDNER MEMORIAL PRIZE FOR EXCELLENCE IN FRENCH. Awarded to a graduating senior who majored in French.

ALEXANDER HEARD AWARD. Presented annually to the outstanding senior political science major.

RICHARD J. LARSEN AWARD FOR ACHIEVEMENT IN UNDERGRADUATE MATHEMATICS. Established in 2005 to honor the commitment to undergraduate education of Richard J. Larsen, member of the faculty from 1970 to 2005. Presented each spring to the senior math major judged by the faculty to have excelled in all aspects of undergraduate mathematics.

AVERY LEISERSON AWARD. Presented for the best research paper or essay written by an undergraduate in a political science course.

MERRILL MOORE AWARD. Endowed in 1961 by Mrs. Merrill Moore, Squantum, Massachusetts, in memory of her husband. Presented to a graduating senior or a student entering the junior or senior class, selected by the Department of English on the basis of "literary promise and the psychological or practical usefulness of the award" to the student.

DANA W. NANCE PRIZE FOR EXCELLENCE IN A PREMEDICAL CURRICULUM. Endowed in 1985 by the family and friends of Dana W. Nance (B.A. 1925, M.D. 1929). Awarded annually to a student who has demonstrated the perseverance to succeed in a premedical curriculum and who embodies the attributes of a caring physician.

JUM C. NUNNALLY AWARD. Established in 1987 in memory of this professor of psychology from 1960 to 1982. Presented to a graduating senior in the honors program of the Department of Psychology for the best research project.

DONALD E. PEARSON AWARD. Presented annually to a graduating senior in chemistry adjudged the most distinguished in undergraduate research in chemistry.

PHI BETA KAPPA FRESHMAN SEMINAR AWARD. Awarded annually to students who have done outstanding creative work in freshman seminars.

AWARD FOR OUTSTANDING RESEARCH IN MOLECULAR BIOLOGY. Presented to a senior in molecular biology for outstanding research performed as part of the major program in molecular biology.

OUTSTANDING SENIOR IN CHEMISTRY AWARD. Presented annually to that graduating senior in chemistry who, in the opinion of the faculty of the Department of Chemistry, shows most promise of an outstanding career.

HENRY LEE SWINT PRIZE. Awarded since 1978 for the best essay in history.

D. STANLEY AND ANN T. TARBELL PRIZE IN ORGANIC CHEMISTRY. Awarded annually to a graduating senior who has excelled in organic chemistry by earning the highest grades in courses or performing outstanding research in organic chemistry.

UNDERWOOD MEMORIAL AWARD. Endowed in 1961 by the late Newton Underwood in memory of his father, Judge Emory Marvin Underwood, long-time member of the Board of Trust. The cash award is given to the most deserving and most promising graduating senior or graduate student in physics.

SUSAN FORD WILTSHIRE PRIZE. Cosponsored by the Women's and Gender Studies program and the Women's Faculty Organization, this award is given annually for the best undergraduate essay that deals with gender issues.

KATHARINE B. WOODWARD PRIZE. Awarded since 1943 and endowed in 1962 by Miss Katharine B. Woodward, Class of 1919, for excellence in Spanish studies.

MARGARET STONEWALL WOOLDRIDGE HAMBLET AWARD. Endowed in 1983 by Clement H. Hamblet in memory of his late wife, who began her art studies at Peabody College. The award is given to a graduating student of outstanding merit in studio art to enable the pursuit of his or her creative development through one year of extensive travel and further studies in studio art.

Academic Regulations

Honor System

All academic work at Vanderbilt is done under the Honor System. (See the chapter on Life at Vanderbilt.)

Class Attendance

Students are expected to attend all scheduled meetings of classes in which they are enrolled; they have an obligation to contribute to the academic performance of all students by full participation in the work of each class. At the beginning of the semester, instructors explain the policy regarding absences in each of their classes, and thereafter they report to the Dean's Office of Undergraduate Education in the College of Arts and Science the name of any student whose achievement in a course is being adversely affected by excessive absences. In such cases an associate dean, in consultation with the instructor, takes appropriate action, which may include dropping the student from the class; students dropped after the deadline for withdrawal (see Period for Withdrawal) receive the grade *F*. Class attendance may be specified as a factor in determining the final grade in a course, and it cannot fail to influence the grade even when it is not considered explicitly.

The last day before and the first day after official holidays are considered to be the same as any other day on which classes are scheduled. Assignments are made for classes scheduled on these days, and tests may be given in them. Students should take this fact into account in making travel plans.

The faculty of the College of Arts and Science recognizes that occasions arise during the academic year that merit the excused absence of a student from a scheduled class or laboratory during which an examination, quiz, or other graded exercise is given. Examples include participation in sponsored university activities (e.g., debate team, varsity sports), observance of officially designated religious holidays, serious personal problems (e.g., serious illness, death of a member of the student's family), and matters relating to the student's academic training (e.g., graduate or professional school interviews). While determination of the merit of a case is left primarily to the discretion of the individual instructor, conflicts arising from personal travel plans or social obligations do not qualify as excused absences. Except in unusual circumstances, the Dean's Office of Undergraduate Education does not grant excused absences for students. For more information please visit <https://as.vanderbilt.edu/academics/policies/absences.php>.

The primary determination of whether a student's absence from class occurs for a reason that warrants rescheduling a graded exercise for that student is left to the judgment of the individual instructor. A standard of reasonableness should apply in making such judgments.

Except in cases of true emergency, student petitions for making up missed graded exercises must be made prior to the missed class, preferably at the beginning of the semester or at the earliest time thereafter when the need to be absent is known to the student. Faculty members retain discretion in the form and timing of makeup exercises or in devising other strategies for accommodating students.

The faculty of the College of Arts and Science authorizes the Office of the Dean to resolve through arbitration any cases

that cannot be directly resolved between students and their instructors.

Classroom Recording Policy

The use of technologies for audio and video recording of lectures and other classroom activities is allowed only with the express permission of the instructor. In cases where recordings are allowed, such content is restricted to personal use only unless permission is expressly granted in writing by the instructor and by other classroom participants, including other students. Personal use is defined as use by an individual student for the purpose of studying or completing course assignments. When students have permission for personal use of recordings, they must still obtain written permission from the instructor to share recordings with others.

For students registered with the Office of Student Access Services and who have been approved for audio and/or video recording of lectures and other classroom activities as a reasonable accommodation, applicable federal law requires instructors to permit those recordings. Such recordings are also limited to personal use, except with permission of the instructor and other students in the class.

Course Registrations

Normal Course Load

Each semester, regular tuition is charged on the basis of a normal course load of 12 to 18 semester hours. No more than 18 or fewer than 12 credit hours may be taken in any one semester without authorization of the Administrative Committee or an associate dean in 350 Buttrick Hall. (There is an extra charge for more than 18 credit hours at the current hourly rate.) First-year students may not take more than 18 credit hours in a semester.

Students permitted to take fewer than 12 credit hours are placed on probation, unless their light load is necessary because of outside employment or illness. During the summer session, there is no minimum course load. Summer loads exceeding 14 credit hours must be authorized by an associate dean in 350 Buttrick Hall.

Credit hours are semester hours; e.g., a three-hour course carries credit of 3 semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements that exceed this definition.

A student must be enrolled in a minimum of 12 credit hours to be classified as a full-time student.

Auditing

Regularly enrolled Arts and Science students who want to audit courses in any of the undergraduate schools of the university must obtain the written consent of the instructor to attend the class but do not register for the course for credit. Forms are available from the Dean's Office of Undergraduate Education in each school. No permanent record is kept of the audit. Regular students may audit one class each semester.

Taking Courses for No-Credit

Students may want to take elsewhere in the university courses that are not creditable toward the bachelor's degree. They may do so on a no-credit basis, attending classes, doing all the work of the course, and receiving a grade that is recorded on the transcript with a notation that it does not count toward the degree.

No-credit courses count in computation of the student's academic load and in computation of tuition, but not in computation of the grade point average. They also do not count toward the attainment of class standing.

Taking Courses for P/F Credit

Students may elect to take a limited number of courses on a Pass/Fail (P/F) basis. To enroll for a course on a Pass/Fail basis, students must have completed at least two semesters at Vanderbilt, must have achieved at least sophomore standing, and must not be on academic probation.

No more than 18 credit hours graded *P* may be counted toward the degree, and no more than one course per term may be taken P/F.

The P/F option does not apply to courses in the following categories:

1. Courses counted toward AXLE requirements;
2. Courses in the major field(s), other courses that may be counted toward the major(s), or courses required for the major(s);
3. For students with a defined interdisciplinary major, courses that are required for the major or that are eligible to count toward the major;
4. For students with an individually designed interdisciplinary major, courses listed in the student's plan of study;
5. For students planning an optional minor, courses in the minor field or those eligible to count toward an interdisciplinary minor;
6. Courses eligible to count toward the major or minor, regardless of whether the student has already satisfied major or minor requirements;
7. Courses that have been specifically excluded from the P/F option;
8. Courses taken previously.
9. Minimum 12 graded credit hours required.
10. A graduating senior who has permission to take fewer than 12 credit hours on a graded basis may take one course on a P/F basis in addition to the courses required for graduation. If the student does not graduate at the end of that semester, the *P* grade is automatically converted to the grade actually earned.

Students may register for grading on a Pass/Fail basis until the close of the Change Period at the end of the second week

of classes. Students may change from Pass/Fail to graded status until the deadline date for withdrawing from a course that is published in the Academic Calendar. Pass/Fail rules, requirements, and deadlines are not petitionable.

Those electing the Pass/Fail option must meet all course requirements (e.g. reports, papers, examinations, attendance, etc.) and are graded in the normal way. Instructors are not informed of the names of students enrolled on a Pass/Fail basis. At the end of the semester, a regular grade is submitted for the student enrolled under the P/F option. Any grade of *D-* or above is converted in the Student Records System to a *P*, while an *F* will be recorded if a student enrolled under this option fails the course. The *P* grade is not counted in the grade point average nor used in the determination of honors. The grade of *F* earned under the Pass/Fail option is included in the calculation of the grade point average.

The grade for a class will be converted from *P* to the recorded letter grade if a student later declares a major or minor toward which that class counts. The recorded letter grade will be included in both the overall and the major or minor grade point average.

Undergraduate Enrollment in Graduate Courses

In the 4-digit course numbering system initiated in Fall 2015, some courses may enroll undergraduate and graduate students simultaneously. Typically, there is a 3000- or 4000-level course for undergraduates and a matching 5000-level course for graduate students. Undergraduate students may enroll in the 3000- or 4000-level course of these pairs without special approval.

A qualified Vanderbilt University senior undergraduate may enroll in courses approved for graduate credit (those numbered 5000 and higher) and receive credit that, upon the student's admission to the Vanderbilt Graduate School, may be applicable toward a graduate degree. Vanderbilt cannot guarantee that another graduate school will grant credit for such courses. The principles governing this option are as follows:

1. Work taken under this option is limited to those courses approved for graduate credit (those numbered 5000 and higher) and listed as such in the Graduate School catalog, excluding thesis and dissertation research courses and similar individual research and readings courses. Courses approved for professional credit (i.e., many courses in the Divinity School, Law School, School of Medicine, School of Nursing, and Owen Graduate School of Management) may not be taken as part of this option.
2. The student must, at the time of registration, have a 3.00 average in all prior work to be counted toward the bachelor's degree, or a 3.00 average in all prior work to be counted toward the undergraduate major, or a 3.00 average in the preceding two semesters.
3. The total course load, including both graduate and undergraduate courses, must not exceed 15 credit hours in any semester.
4. No undergraduate student may enroll in more than one graduate course in any semester.
5. A registration form for undergraduate Arts and Science students wishing to exercise this option is available in the Dean's Office of Undergraduate Education. The interested student must use this form to obtain the written approval of the following:

- a) the academic adviser,
- b) the instructor of the course,
- c) and the director of graduate studies of the department or program.

Reserving Credit for Graduate School

1. Arts and Science students who are interested in reserving the credit earned in a graduate course (those numbered 5000 and higher) should consult with the Graduate School before attempting to register for graduate courses under this option.
2. The work must be in excess of that required for the bachelor's degree.
3. All of the above criteria apply under this option.
4. Students must declare their intention to reserve this credit on the registration form.
5. Permission for Vanderbilt undergraduates to enroll in graduate courses does not constitute a commitment on the part of any department to accept the student as a graduate student in the future.
6. An undergraduate student exercising this option is treated as a graduate student with regard to class requirements and grading standards.

Independent Study and Directed Study Courses

Independent study and directed study courses are intended primarily for students in their junior and senior years. Students may not take an independent study or directed study course that duplicates a regular course being offered in the same semester. Juniors or seniors who wish to take independent study or directed study courses must use the following procedure:

1. Obtain permission to enroll from the instructor of their choice. Consult the instructor prior to the course request period of registration for the semester in which the study is to be undertaken.
2. Register for the course through the appropriate department.
3. Make a written study plan detailing the nature of the project and the amount of credit and have it approved by the instructor and the department chair (or the chair's designee) by the tenth day after classes begin.

Duplication of Course Content

It is the responsibility of the individual student to avoid duplication in whole or in part of the content of any course counting toward the degree. Such duplication may result in the withdrawal of credit.

Repeated Courses

Most courses offered in the College of Arts and Science may be repeated. If a course was failed the last time it was taken, credit is awarded when the course is repeated with a passing grade. If a course was previously passed, no new credit is earned. If a course previously passed is repeated and failed, credit originally earned for it is lost. In any case all grades earned are shown on the transcript. Under conditions explained below, the most recent grade in a course replaces the previous grade in determining credit, in computing the

grade point average, and in verifying the completion of degree requirements and progress toward the degree.

The policy of grade replacement applies when all of the conditions below are met.

1. Failed courses may be repeated until passed; passed courses may be repeated only once.
2. Exactly the same course (same department and course number) is completed. For First-Year Writing Seminars, it must be the same department and section number, but FYWS cannot be repeated after completion of the second semester in residence. In addition, a very small number of differently numbered courses as approved by the faculty may be substituted under this policy. These are designated in the departmental course listings.
3. The course is repeated on a regularly graded basis. This limitation applies even if the course was originally taken on a P/F basis.
4. The course is not one in independent study or directed study.
5. A non-W course is taken as repeat credit for a Writing version of the same course that was previously passed. The student loses credit for the writing requirement.
6. A W course is taken as repeat credit for a non-Writing version of the same course that was previously passed. The student earns credit for the writing requirement.
7. Certain courses (e.g., ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credit hours allowable per semester will be included in the course description.

In some instances, enrollment in a course similar to one already completed but with a different course number will result in the award of no credit for the second course and will have no effect on the grade point average. These are designated in the departmental course listings.

Courses taken in the College of Arts and Science may not be repeated elsewhere for grade replacement.

Students are cautioned that while repeating for grade replacement a course previously passed may improve their cumulative grade point average, it may also lead to a problem in meeting minimum credit hours requirements for class standing because no new credit is earned.

The Registration Process

A period is designated in each semester during which continuing students, after consultation with their advisers, register for work to be taken during the next term. The student's adviser must release the advising hold in YES before the student can register.

Students are asked to plan their immediate and long-range educational programs with their faculty advisers before registering and to consult their advisers when they make changes in their registration.

Students not meeting specified tuition payment deadlines are not permitted to register. See the chapter on Financial Information for details.

Before registering, students should check their own records carefully with respect to the following items:

1. AXLE requirements;
2. Major requirements;
3. Requirements of any optional minor(s) sought;
4. Course prerequisites.

Period for Withdrawal or Change from P/F Status

After the Change Period, and extending to the end of the eighth week of classes, a student may withdraw from a course with approval from the student's adviser. Under certain conditions, withdrawal may also require approval from an associate dean in 350 Buttrick Hall. During the same period students may change their status from P/F to regularly graded—but not vice versa—in a course.

These changes must be made with a Change of Course form, which is available online and which the student must submit to the Dean's Office of Undergraduate Education in Arts and Science. After the end of the eighth week, withdrawal is possible only in the most extraordinary circumstances, such as illness or unusual personal or family problems, and in all cases must be approved by the Administrative Committee. After the end of the eighth week, change from P/F to regularly graded status is not permitted.

Students who withdraw from a course after the change period receive the grade *W* (withdrawal). This grade is not used in the computation of the grade point average or class rank. A student who defaults in a course without dropping or withdrawing from it receives the grade *F*.

Minimum Graded Credit Hours

A course may not be dropped without authorization of the Administrative Committee or an associate dean if the student is left with a course load of fewer than 12 credit hours on a regularly graded basis.

Mid-Semester Progress Reports

At the end of the seventh week of each semester, instructors assess the progress of all students in their classes and report those whose work at that point is deficient or whose work is being harmed by excessive absences. Grades to be reported are *C-*, *D+*, *D*, *D-*, *F*, and *I* (for incomplete, meaning that some work due by that point has not been submitted). Instructors may combine with one of these grades or assign separately a notation of excessive absences from a class. Reports of these deficiencies are posted to students' Access to Academic Information online summary. Grades given at mid-semester do not become part of the permanent record but are intended to warn students about performance judged unsatisfactory.

Examinations

Each department establishes procedures for evaluating student performance, and normally the method of evaluation is the responsibility of the course instructor. At the beginning of the semester instructors should clearly state the evaluation procedures, including types of examinations, to be used in their courses. Students should have adequate opportunity during the semester to demonstrate their knowledge of the subject matter and should be given an indication of their progress in the course prior to the deadline for dropping courses. Instructors are cautioned against placing excessive weight on the final examination when determining a student's grade in a course.

Dead Week

No examinations of any type—including quizzes, hour examinations, and portions of final examinations—are allowed during the last week of classes; papers and in-class presentations are permitted during dead week. The Administrative Committee may grant special permission to the instructor in charge of a course to give laboratory examinations during the last regular laboratory period of the last week of classes. The last week of classes is defined as the last seven calendar days preceding the end of classes. If, for example, classes end on Tuesday, then the "dead week" begins the preceding Wednesday and lasts through Tuesday. Students should notify the Dean's Office of Undergraduate Education of any violation.

Final Examinations

The primary and alternate final examination schedules issued each semester allow two hours for a final examination in each course. Each in-class final examination must be given at the time indicated on the primary schedule. The alternate schedule is used only if the instructor decides to give an in-class examination at two times. The final examination period lasts for about a week and a half.

Alternatives to the standard in-class final examination are permitted at the instructor's discretion. Some examples are take-home examinations, oral examinations, and term papers; there need not be a final examination if adequate evaluation procedures have been used during the term. A take-home or oral examination should make approximately the same demand on a student's time as an in-class examination and should be conducted during the final examination period. A take-home examination must be distributed at the last regular class meeting and must be completed by either the primary or the alternate examination date, whichever is later.

All examinations are conducted under the Honor System.

The instructor's record of grades given during a course and any final examination papers not returned to students must be kept on file by the instructor for the first month of the semester following the conclusion of the course. For spring semester and summer session courses, this rule means the first month of the fall semester.

Monitoring these regulations is the responsibility of the departments, under the supervision of the Dean's Office of Undergraduate Education. Variations from the regulations—such as changing the time of an in-class final examination for an entire class—are allowed only on approval of the Administrative Committee.

Comprehensive Examination

Any department or interdisciplinary program may require a comprehensive examination of its major students as a condition of graduation.

Senior Re-examination

A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed prevents the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from re-examination. The re-examination must be requested through the Dean's Office of Undergraduate Education, and if approved, it is given immediately after the close of the last semester of the

student's senior year. A student who passes the re-examination will receive a *D-* in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course.

Credit by Examination

In certain circumstances, students may be awarded course credit by departmental examination. (This procedure is distinct from the award of credit through the College Board Advanced Placement Tests taken prior to the student's first enrollment.)

Students who wish to earn credit by departmental examination should consult the Dean's Office of Undergraduate Education in Arts and Science concerning procedures. To be eligible, students must be carrying a minimum of 12 credit hours and be in good standing.

Students must obtain the approval of the chair of the department that is to give the examination and the instructor designated by the chair. Students may earn up to 18 hours of credit by any combination of credit through advanced placement examinations and credit by departmental examination. Students may earn up to 8 hours of credit by examination in any one department. Students may attempt to obtain credit by examination no more than twice in one semester, no more than once in one course in one semester, and no more than twice in one course. Students may not repeat a course for grade replacement under the credit by examination procedures. Credits earned by credit by examination may not be counted toward AXLE.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 credit hours are not charged extra tuition for hours earned through credit by examination, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses and courses dropped after the Change Period. Students in this category must pay a \$50 fee for the cost of constructing, administering, and grading the examination. Since this cost has already been incurred, students who refuse the credit hours and grade are charged the \$50 fee nevertheless.

Full-time students with a tuition load exceeding 18 credit hours and students taking fewer than 12 credit hours pay tuition at the regular rate with no additional fee.

Grades and Credit

Grade Reports

Students have access to their grade reports on the Academic Record in YES. Notifications are sent to students in their last two semesters, showing total credit hours, grade point average, and degree requirements still to be met. Students should examine their Degree Audit reports carefully and discuss them with their faculty advisers. Any errors should be reported immediately to the Dean's Office of Undergraduate Education (see also Change of Grade).

Grading System

- A: excellent
- B: good
- C: satisfactory
- D: minimum pass work
- F: failure

Under certain circumstances the following grades may be awarded:

- W: withdrawal
- P: (see P/F Course Provision)
- M: absent from final examination
- I: incomplete in some requirement other than final examination
- MI: absent from final examination and incomplete work
- IP: first semester grade for two-semester Honors sequence

Plus and minus modifiers may be associated with letter grades *A* through *D* as shown in the table below. Grade point averages are calculated using indicated grade point values.

Defined Grades with Corresponding Grade Points Per Credit Hour

A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
C+	= 2.3	F	= 0.0

Grade Point Average

A student's grade point average is obtained by dividing the quality points earned by the credit hours for which the student has registered, excluding courses taken for no credit, those from which the student has officially withdrawn (see Withdrawal Period under Registration above), and those completed with the grade *P*.

In no case is the grade point average affected by transfer credit. No course at another institution in which a grade below *C-* was received, or which was taken on a Pass/Fail basis, is credited toward the degrees awarded by the College of Arts and Science.

Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. Temporary grades are not calculated in the GPA, but a student who receives a temporary grade is ineligible for the Dean's List. Students cannot graduate with any temporary grades.

M: Missing a Final Examination

The grade *M* is given to a student who misses a final examination and is not known to have defaulted in the course, unless the student could not have passed the course even with the final examination, in which case the grade *F* is given. The course grade of a student known to have defaulted on a final examination is computed on the basis of a score of zero for the final examination. It is the responsibility of the student who misses a final examination, in consultation with the professor of the course, to notify the Dean's Office of Undergraduate Education immediately. If the excuse is considered adequate, the grade *M* is authorized.

A student who secures authorization for an absence at the proper time is obliged to arrange a makeup examination, in consultation with the instructor of the course. It is optimal

that this makeup examination is administered during the first full week after the Change Period of the next semester, provided the student is in residence. If the student is not in residence, the grade *M* must be removed by a makeup examination given within a maximum period of one year from the date of the missed examination and during one of the regular makeup examination periods. If the student fails to take the makeup examination within the prescribed time, the *M* grade will be replaced by a default grade submitted by the instructor when the *M* is assigned.

I: Incomplete

The grade of *I* is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The *I* is not intended as a replacement for a failing grade, nor should it be assigned if a student simply misses the final examination. The grade of *M* is used for the latter purpose. The grade for a student who misses a final examination and whose work is also incomplete in other respects is reported as *MI*. The request for an *I* is generally initiated by the student but must be approved and assigned by the instructor. When assigning an Incomplete, the instructor specifies (a) a deadline by which the *I* must be resolved and replaced by a permanent grade and (b) a default course grade that counts the missing work as zero. The deadline may be no later than the end of the next regular semester. The Incomplete can be extended beyond the next semester only if an associate dean determines that an extension is warranted. If the required work is submitted by the deadline for removing the Incomplete, the *I* will be replaced by the grade earned. If the work is not completed by the deadline, the default grade will become the permanent grade for the course.

MI: Missing a Final Examination and Other Work

The grade for a student who misses a final examination and whose work is also incomplete in other respects is reported as *MI*. This grade may not be turned in without prior authorization by an associate dean. It is the responsibility of the student who misses a final examination, in consultation with the professor of the course, to notify the Dean's Office of Undergraduate Education immediately.

F: Failure

The grade *F* indicates failure. All *F*'s are counted in the computation of grade point averages, except when a course is repeated and is subsequently passed. In this case the latest grade is used for computation of the grade point average (but the grade originally earned is not removed from the transcript). A course in which the grade *F* is received must be repeated as a regular course if credit is to be given. It may not be repeated as a course in independent or directed study, under the procedures for credit by examination, or on a P/F basis.

Change of Grade

A grade reported and recorded in the Office of the University Registrar may be changed only upon request of the instructor with the approval of the Administrative Committee. The committee will approve such a change only on certification that the original report was in error.

Transfer Credit

It is the student's responsibility to provide all of the information required by the Office of the University Registrar to assess the program for which transfer of credit is requested. Work presented for transfer must be from a regionally accredited college and is subject to evaluation in light of the degree requirements of the College of Arts and Science. Credit will not be awarded for independent study, physical education, or dance performance courses.

Work transferred to Vanderbilt from another institution will not carry with it a grade point average. No course in which a grade below C- was received, or which was taken on a Pass/Fail basis, will be credited toward a degree offered by the College of Arts and Science. The question of credit in the College of Arts and Science for previous work done at another institution must be settled in advance of the student's first registration.

Transfer students must spend at least four full semesters, including the last two semesters, enrolled in the College of Arts and Science. They must earn at least 60 credit hours and complete at least one writing course in fulfillment of the writing requirement while so enrolled.

Residence Requirement

A minimum of four normal semesters (at least 60 credit hours), including the last two semesters (at least 30 credit hours), must be spent in residence in the College of Arts and Science unless an exception is made by the Administrative Committee. Students transferring from other schools of the university must spend the last year (at least 30 credit hours) in residence in the College of Arts and Science.

Summer Work at Another Institution

Students enrolled in the College of Arts and Science may receive transfer credit for a maximum of two courses taken during summers at a regionally accredited institution. To qualify for such credit, the student must be in good standing and must obtain prior authorization from the appropriate department by submitting courses through the Transfer Credit Submission application in YES. A detailed course syllabus is required in order for a course to be evaluated. Such courses cannot fulfill AXLE requirements, count as part of the last 30 credit hours in residence, duplicate a course taken previously, or be taken on a Pass/Fail or similar basis.

Semester Work at Another Institution

Students who wish to receive transfer credit for a semester of work at another institution must receive approval in advance from the Committee on Individual Programs. To qualify for such credit, the student must be in good standing and must present to the committee a plan that makes clear the educational rationale for such work, the ways in which it supplements the Vanderbilt curriculum, and the equivalence of standards to those at Vanderbilt. Approval of the overall plan by this committee must be followed by submitting courses through the Transfer Credit Submission application in YES. A detailed course syllabus is required in order for a course to be evaluated. Such courses cannot fulfill AXLE requirements, count as

part of the last 30 credit hours in residence, duplicate a course taken previously, or be taken on a Pass/Fail or similar basis.

Senior-in-Absentia

A student who wishes to earn a baccalaureate degree in the College of Arts and Science in absentia must have (a) completed the AXLE requirements and all major requirements; (b) earned at least 105 credit hours and a grade point average of 2.000 with at least 60 credit hours earned in a minimum of four semesters of residence in the College of Arts and Science; (c) been accepted at a professional or graduate school where, during the first year, the remaining credit hours needed for graduation can be earned; and (d) obtained the approval of the major department and an associate dean of the College of Arts and Science. Students who have completed fewer than 105 credit hours may petition the Administrative Committee for special consideration.

The limitation on credit hours outside the College of Arts and Science applies to all bachelor of arts candidates.

Students in the senior-in-absentia program pay a minimum semester tuition charge to the College of Arts and Science (see Financial Information).

Student Leave of Absence

A student desiring a leave of absence should obtain application forms and instructions from the Dean's Office of Undergraduate Education in the College of Arts and Science. All students are eligible, provided they have not been dropped by the university and are not dropped at the end of the semester during which application is made. But students may take a leave no more than twice during their career in the College of Arts and Science.

Leaves are granted for one semester or for a year. Applications should be completed before the end of the fall semester for a leave of absence during the spring semester, and before August 15 for a leave of absence during the fall semester (or for the academic year). If the leave is approved, the student must keep the Office of the University Registrar informed of any change of address while on leave.

A student who takes a medical leave after mid-semester is expected to be on leave for the following regular semester as well. A student who plans to return from medical leave must submit appropriate documentation to the Dean's Office of Undergraduate Education and the Office of Student Care Coordination.

A student in good standing who seeks to transfer to Vanderbilt credit earned elsewhere while on leave of absence must obtain permission in advance from the Committee on Individual Programs. Applications for leaves of this type must be filed with the committee at least one month before the close of the preceding semester.

Registration information is emailed to students on leave of absence. A student failing to register at the conclusion of the stated leave will be withdrawn from the university and must apply for reinstatement.

Withdrawal from the University

Students proposing to withdraw from the university during a regular term must report to the Dean's Office of Undergraduate Education in the College of Arts and Science to initiate proper clearance procedures. If withdrawal from the university is officially authorized, the student will receive withdrawal grades on the same basis as a student withdrawing from a particular

course or courses. (See the section on Period for Withdrawal under Registration above.)

Change of Address

Students are responsible for keeping the university informed of their correct mailing addresses, both school and home. They should notify the university, through the Office of the University Registrar, online or in writing, of any address changes as soon as possible. They are provided an opportunity to review address information at registration. The university will consider notices and other information delivered if mailed to the address on file in the Office of the University Registrar.

Academic Discipline

The College of Arts and Science requires each student to maintain an academic record that will permit graduation according to a specified schedule. Students are considered to fall short of the expected rate of progress when

1. They pass fewer than 12 credit hours in a semester or have a semester grade point average lower than 1.500; or
2. In a summer they take 12 or more credit hours but pass fewer than 12 credit hours or earn a grade point average lower than 1.500; or
3. They fail to achieve sophomore, junior, or senior standing within the time allowed; or
4. They accumulate more than two probations after the freshman year, in which case they will normally be dropped from the university; or
5. As first-semester freshmen they pass fewer than two courses or earn a semester grade point average lower than 1.000, in which case they may be required to take a probationary leave of absence; or
6. As first-semester freshmen they earn fewer than 9 credit hours or a semester grade point average lower than 1.500, in which case they may be offered a choice (see Semester Requirements below).

Any student who falls somewhat short of the prescribed levels of academic achievement is normally placed on probation. Any student who fails by a wide margin to reach these levels or who has been placed on probation more than once is reviewed by the Administrative Committee, and may be dropped from the university without having previously been placed on academic probation. The committee considers each case within the framework of the guidelines outlined below and may take any of several actions, among which are the following:

1. The student may be placed on probation;
2. The student may be advised to take a leave of absence or to withdraw from the university;
3. The student may be required to take a leave of absence;
4. The student may be dropped from the university.

Semester Requirements

Full-time students are expected to earn each semester at least 12 credit hours and a minimum grade point average of 1.500. Students who fall short of these levels are normally placed on probation. Students are removed from probation after earning at least 12 credit hours and a semester grade point average of

1.500 or better, assuming they have fulfilled the requirements for class standing stated below.

First-year students who pass fewer than two regular courses in their first regular semester or who earn a semester grade point average lower than 1.000 have so seriously compromised their academic standing that they may be required to take a probationary leave of absence until the beginning of the following fall semester.

First-year students who earn fewer than 9 credit hours or a grade point average lower than 1.500 in the fall may, at the discretion of the Administrative Committee, choose a probationary leave for the spring and return the next fall with two semesters in which to qualify for sophomore standing.

A student on probationary leave may not earn credit at another institution for transfer to Vanderbilt. In appropriate cases the Administrative Committee may prescribe conditions that must be satisfied before the student returns from a probationary leave. Students who do not choose to return at the end of a probationary leave but want to return later are required to apply for reinstatement.

After their first year, full-time students may not be placed on probation more than twice (continuance on probation for a second semester counts as another probation). If a student's performance is deficient a third time, the student is dropped from the university.

Students who have been authorized to carry fewer than 12 credit hours because of illness or outside employment may be placed on academic probation if their work is deemed unsatisfactory by the Administrative Committee; they are removed from probation when the committee deems their work satisfactory. If they are not removed from probation after a reasonable period of time, such students are dropped.

The internal record of a student dropped from the university under these regulations shows the notation "Dropped for scholastic deficiency."

Class Standing

The Administrative Committee determines how many semesters will be allowed for each part-time student to attain sophomore, junior, or senior standing.

The internal record of a student dropped from the university under these regulations shows the notation "Failed to qualify for class standing."

Sophomore Standing

A student qualifies for sophomore standing upon completion of 24 credit hours of work with a grade point average of at least 1.800, completion of two regular semesters (fall or spring), and completion of the first-year writing requirement: successful completion of English 1100 if required and successful completion of a First-Year Writing Seminar (numbered 1111 in various disciplines). First-year students who fail to qualify for sophomore standing in two semesters are placed on probation and must have the permission of the Administrative Committee to register for a third semester. The third semester must be the summer semester at Vanderbilt. Normally, students who do not qualify for sophomore standing during this third semester are dropped from the university.

Junior Standing

A student qualifies for junior standing upon completion of 54 credit hours of work with a grade point average of 1.900, completion of four regular semesters (fall or spring), and completion of a W course at any level (other than ENGL 1100 or a First-Year Writing Seminar). Sophomores who fail to qualify for junior standing within two semesters after qualifying for sophomore standing are placed on probation and must have the permission of the Administrative Committee to register for another semester. This additional semester must be the summer semester at Vanderbilt. Normally, students who do not qualify for junior standing in this additional semester are dropped from the university.

Senior Standing

A student qualifies for senior standing upon completion of 84 credit hours of work with a grade point average of 2.000 and completion of six regular semesters (fall or spring). Juniors who fail to qualify for senior standing within two semesters after qualifying for junior standing are placed on probation and must have the permission of the Administrative Committee to register for another semester. This additional semester must be the summer semester at Vanderbilt. Normally, students who do not qualify for senior standing in this additional semester are dropped from the university.

Seniors who fail to maintain a minimum grade point average of 2.000 are placed on probation and must have the permission of the Administrative Committee to register for another semester.

Petitions and Appeals

The Administrative Committee of the College of Arts and Science entertains petitions from currently enrolled students for exceptions to academic regulations. Any student subject to action by the Administrative Committee may appeal that action to the committee in writing. Further appeals from decisions of the committee follow standard university policies as described in the *Student Handbook*.

Returning to the College

Students on leave of absence return to the university at the end of the leave. If they do not return at that time and want to return later, they must apply to the Office of the University Registrar for reinstatement. Students who are advised to withdraw from the university determine whether or not to return in consultation with the Dean's Office of Undergraduate Education. Students who have been dropped may apply to the Office of the University Registrar for reinstatement; in most cases reinstatement is not granted unless there has been an intervening period of at least a year. The Office of the University Registrar forwards all documents to the Administrative Committee, which considers each case on an individual basis. Reinstatement is competitive, and there is no assurance that it will be granted. Students reinstated after having been advised to withdraw or after having been dropped are automatically on final probation. If they fail to regain good standing and to maintain it until graduation, they are dropped again with little prospect for reinstatement. Application deadlines for reinstatement are as follows: July 15 for the fall semester, November 15 for the spring semester, and April 1 for the summer session.

Programs of Study

African American and Diaspora Studies

CHAIR Tracy D. Sharpley-Whiting
 DIRECTOR OF UNDERGRADUATE STUDIES Claudine Taaffe
 DIRECTOR OF GRADUATE STUDIES Gilman W. Whiting
 PROFESSORS Victor Anderson, Houston Baker, David Ikard,
 Hector F. Myers, Alice Randall, Tracy D. Sharpley-Whiting,
 Paul C. Taylor
 ASSOCIATE PROFESSORS Tiffany R. Patterson, Gilman W. Whiting
 SENIOR LECTURER Claudine Taaffe
 WRITER IN RESIDENCE Alice Randall

THE concentration in African American and Diaspora Studies requires 36 credit hours of course work. Approved courses taken at Fisk University may be counted as electives in the program. The course of study in the African American and Diaspora Studies program is divided into three areas: Area of Study I, Gender and Sexuality; Area of Study II, Literature, Theory, and Visual Culture; and Area of Study III, Social Sciences. Courses that satisfy each area are listed under “Areas of Study and Electives” below.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in African American and Diaspora Studies

Requirements for the major include at least 36 hours of credit as follows:

- 3 credit hours from 1010, Introduction to African American and Diaspora Studies.
- 6 credit hours from Area of Study I, Gender and Sexuality.
- 6 credit hours from Area of Study II, Literature, Theory, and Visual Culture.
- 6 credit hours from Area of Study III, Social Sciences.
- 9 credit hours of electives chosen from Areas of Study I, II, and III, not used to satisfy requirements 2 through 4 above.
- 3 credit hours from 4270, Research Methods. Majors are advised to take this course in the second semester of their junior year.
- 3 credit hours in either 4978 (fall) or 4979 (spring), Senior Thesis in African American and Diaspora Studies.

At least 6 credit hours of the concentration must focus on the Americas (outside of the United States) and/or Africa. No more than 9 credit hours of course work may be taken at the 1000 level (excluding 1010).

Honors Program

The only route to honors in the major is writing a 3 credit hour Senior Honors Thesis in AADS 4998 (fall) or 4999 (spring) and

passing an oral examination. Admission to the Honors Program requires a student have a grade point average of at least 3.5 in all AADS courses and a cumulative GPA of 3.3. A committee of three faculty members (two of whom must be involved in undergraduate teaching in the African American and Diaspora Studies program) will evaluate the thesis. Students pursuing the Senior Honors Thesis may apply to the program for nominal funding to assist with research projects. The chair of the student's thesis committee and two readers must attend the oral examination. The oral defense will typically take place in the second semester of the student's senior year.

Minor in African American and Diaspora Studies

Requirements for completion of the minor include at least 21 credit hours as follows:

- 3 credit hours in 1010, Introduction to African American and Diaspora Studies.
- 3 credit hours from Area of Study I, Gender and Sexuality.
- 3 credit hours from Area of Study II, Literature, Theory, and Visual Culture.
- 3 credit hours from Area of Study III, Social Sciences.
- 9 credit hours of electives chosen from Areas of Study I, II, and III, not used to satisfy requirements 2 through 4 above.

At least 6 credit hours of the minor must focus on the Americas (outside of the United States) and/or Africa, and no more than 6 credit hours of the minor can be taken at the 1000 level (excluding 1010). Minors are encouraged, though not required, to take 4270 Research Methods in the second semester of their junior year.

Areas of Study

Courses with an asterisk in the lists below fulfill the Africa and Americas outside of the United States portion of the major and minor. Approved courses offered at Fisk may count toward elective requirements.

Area of Study I, Gender and Sexuality

AADS: 1204* Diaspora Feminisms; 2104* Popular Culture and Black Sexual Politics; 2204* Black Women and the Politics of Blackness and Beauty; 2214 History & Myth: Black Women in the United States; 2294* Black Paris–Paris Noir: The African Diaspora and the City of Light; 2514* Insider/Outsider: The Genealogy of Black LGBTQ Peoples; 2654* Memoirs and Biographies; 3104W* Soul Food as Text in Text: An Examination of African American Food ways; 3204W* African American Children's Literature; 3214* Black Masculinity: Social Imagery and Public Policy; 4104 Soul Food as Text in Text II: An Examination of African American Foodways II; 4264* Black Diaspora Women Writers.

Area of Study II, Literature, Theory, and Visual Culture

AADS: 1016* Race Matters; 1506* Reel to Real: Film Aesthetics and Representation; 1706* Capoeira; 1716* The African City; 2106 African Diaspora: A Problem for Thought*; 2166 Blacks in Country Music; 2306* Race, Mixed Race, and “Passing”; 2356* African Spirits in Exile: Diaspora Religions in the Americas; 3106 GOAT: Life, Times, and Politics of Muhammad Ali; 3206 Mystery, Murder, and Mayhem in Black Detective Fiction; 3306

Black Detroit; 4126* The Black Classics; 4256* Haiti: Freedom, Democracy; *4506 Slavery and Public Memory.

Area of Study III, Social Sciences

AADS: 1108* Making of the African Diaspora; 1408* Blacks in Latin America and the Caribbean; 2168* Black Migrations in the African Diaspora; 2178* Global Africa; 3178* Colonialism and After; 3208W Blacks in the Military; 3258 Black Issues in Education; 3278* Black Europe; 3458* Atlantic African Slave Trade; 4198* Global Anti-Blackness and Black Power*; 4228W Black Girlhood: History, Performance, and Counter-Narratives; 4270 Research Methods.

Other Electives

Any course from the above three areas may serve as an elective if it is not already being used to satisfy an Area of Study requirement. Please consult the director of undergraduate studies for periodic updates about electives including courses that can be taken at Fisk as electives for AADS.

AFRICAN AMERICAN AND DIASPORA STUDIES: 1111* First Year Writing Seminar.

ANTHROPOLOGY: 2105* Race in the Americas; 2106* Culture and Power in Latin America.

ECONOMICS: 2150* Economic History of the United States.

ENGLISH: 3654*/3654W* African American Literature; 3658* Latino-American Literature; 3674* Caribbean Literature; 3742* Feminist Theory.

FRENCH: 3232* Introduction to Francophone Literature; 4023* The African Novel.

HISTORY: 1269* Introduction to African Studies; 1270* Sub-Saharan Africa 1400–1800; 1270W History of Sub-Saharan Africa; 1280* Africa since 1800; 1281W* Making of African Cities; 1410* U.S. 1877–1945: Reconstruction through World War II; 1440* African American History since 1877; 2450* Reform, Crisis, and Independence in Latin America, 1700–1820; 2139* Technology, Nature, Power in Africa; 2490* Brazilian Civilization; 2570* Caribbean History 1492–1983; 2620* The Old South; 2630* The New South; 2684* The History of Black Power; 2686 Race, Rights, American Dream; 2690* The Civil Rights Movement; 2691 Barack Obama: Man and President; 2692W Biographies of Struggle; 2749* American Intellectual History to 1865; 3040* Health and African American Experience; 3200* Poverty, Economy, Society in Sub-Saharan Africa.

HISTORY OF ART: 4960* Advanced Seminar in History of Art.

MUSIC: 1100* World Music; 1105* African Music; 1600* American Popular Music; 1620* Survey of Jazz; 1630* The Blues; 2150* Music, Identity, and Diversity.

RELIGIOUS STUDIES: 1100* Introduction to African American Religious Traditions; 3119* Martin Luther King, Jr., and the Social Roles of Religion; 3142* Slave Thought and Culture in the American South.

SOCIOLOGY: 3207* Popular Culture Dynamics; 3304* Race, Gender, and Health; 3702* Racial and Ethnic Minorities in the United States; 3711* Women, Gender, and Globalization; 3722* Gender in Society; 3723* Gender, Sexuality, and the Body.

SPANISH: 3835* Latino Immigration Experience*; 4750* Afro-Hispanic Literature.

WOMEN'S AND GENDER STUDIES: 1150*/1150W Sex and Gender in Everyday Life; 2240* Introduction to Women's Health; 3250*/3250W Contemporary Women's Movements.

Course descriptions begin on page 147.

American Studies

DIRECTOR Sarah E. Igo (History)

ASSISTANT DIRECTOR Gabriel A. Torres Colón

PROFESSORS C. André Christie-Mizell (Sociology), Colin Dayan (English), Ted Fischer (Anthropology), Vivien Fryd (History of Art), Sarah E. Igo (History), Dana Nelson (English), Cecelia Tichi (English), Emilie Townes (Divinity)

ASSOCIATE PROFESSORS Teresa A. Goddu (English), Ifeoma Kiddoe Nwankwo (English), Richard Pitt (Sociology)

ASSISTANT PROFESSORS Aimi Hamraie (Medicine, Health, and Society), Gabriel A. Torres Colón (Anthropology)

SENIOR LECTURERS Alexander I. Jacobs, Susan Kevra (French)

Affiliated Faculty

PROFESSORS Dan Cornfield (Sociology), Kate A. Daniels (English), Marshall C. Eakin (History), Derek Griffith (Medicine, Health, and Society), Joni Hersch (Law), Larry Isaac (Sociology), Jonathan Metzl (Medicine, Health, and Society), Kelly Oliver (Philosophy), Lucius Outlaw Jr. (Philosophy), Laurel C. Schneider (Religious Studies), Dan Sharfstein (Law), Hortense Spillers (English), Dan Usner (History)

ASSOCIATE PROFESSORS Vanessa Beasley (Communication Studies), Claire Sisco King (Communication Studies), Richard Lloyd (Sociology), Jim Lovensheimer (Musicology), Leah Lowe (Theatre), Ken MacLeish (Medicine, Health, and Society), Paul Miller (French and Italian), Ann Neely (Teaching and Learning), Paul Stob (Communication Studies)

ASSISTANT PROFESSORS Ashley Carse (Human and Organizational Development), Sara Safransky (Human and Organizational Development)

SENIOR LECTURER Chalene Helmuth (Latin American Studies)

OTHER AFFILIATED FACULTY Joe Bandy (Assistant Director of the Center for Teaching)

THE Program in American Studies is an interdisciplinary program fostering the in-depth study of American cultures from a variety of perspectives. Students choose their path through the major or minor based on their own intellectual commitments. Through course offerings, colloquia, and research opportunities, students and faculty examine questions of power and conflict, experience and identity, tradition and social change within and beyond the territorial borders of the United States and the Americas. Matters of class, race, region, gender, ethnicity, sexuality, religion, law, migration, environment, technology, politics, and the arts are central to the curriculum. The program allows study at the local, subnational, national, and global levels, from in-depth investigation of Nashville communities to research on transnational nongovernmental organizations. Students participate in a robust set of extracurricular events, including Road Trips, City Walks, and discussion of current events through the Beyond the Headlines series. The program also encourages and provides opportunities for on- and off-campus research, internships, study abroad, and individual and group projects under the guidance of participating faculty in the humanities, arts, and social sciences.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in American Studies

The interdisciplinary major in American studies consists of 30 credit hours of course work, distributed as follows:

- | | |
|----------------------------------|-----------------|
| 1. Core Requirements | 9 credit hours |
| 2. International Requirement | 3 credit hours |
| 3. Interdisciplinary Requirement | 6 credit hours |
| 4. Electives | 12 credit hours |

Note: No course may be counted twice in calculating the 30 credit hours. No more than 6 credit hours at the 1000 level can count toward the major. Students seeking a second major may count a maximum of 6 credit hours of course work toward meeting requirements in both majors.

1. *Core Requirements* (9 credit hours)

Core Courses:

AMER 1002, Introduction to American Studies (3 credit hours)
AMER 4000, Research Methods Workshop (3 credit hours)
AMER 4960, Senior Project (3 credit hours)

2. *International Requirement* (3 credit hours)

One of the following:

- a) AMER 3200, Global Perspectives on the U.S. (3 credit hours)
- b) With approval of the director of undergraduate studies, a 3 credit-hour course that explicitly addresses a global perspective on the U.S.

Examples of approved courses include:

ANTHROPOLOGY: 3161, Colonial Encounters in the Americas.

ECONOMICS: 4520, Seminar on Globalization.

HISTORY: 2535, Latin America and the United States; 2700, The U.S. and the World; 2710, The U.S. as a World Power.

INTERDISCIPLINARY STUDIES: 3831, Global Citizenship and Service; 3832, Global Community Service; 3833, Seminar in Global Citizenship and Service.

JEWISH STUDIES: 2450, The Jewish Diaspora.

POLITICAL SCIENCE: 2225, International Political Economy; 2236, The Politics of Global Inequality.

3. *Interdisciplinary Requirement* (6 credit hours)

6 credit hours from at least two different interdisciplinary programs: African American and Diaspora Studies; American Studies; Asian Studies; Cinema and Media Arts; Earth and Environmental Sciences; Jewish Studies; Latin American Studies; Latino and Latina Studies; Medicine, Health, and Society; Women's and Gender Studies.

Note: See below for a list of approved courses in interdisciplinary programs.

4. *Electives* (12 credit hours)

Four courses pre-approved to form a study of concentration. See below for a list of approved courses.

Minor in American Studies

The interdisciplinary minor in American studies consists of 15 credit hours of course work, distributed as follows:

- | | |
|------------------------------|----------------|
| 1. Core Requirements | 6 credit hours |
| 2. International Requirement | 3 credit hours |
| 3. Electives | 6 credit hours |

Note: No course may be counted twice in calculating 15 credit hours. No more than 6 credit hours at the 1000 level can count toward the interdisciplinary minor.

1. *Core Requirements* (6 credit hours)

Core Courses:

AMER 1002, Introduction to American Studies (3 credit hours)
AMER 4000, Research Methods Workshop (3 credit hours)

2. *International Requirement* (3 credit hours)

One of the following:

- a) AMER 3200, Global Perspectives on the U.S. (3 credit hours)
- b) A pre-approved course that explicitly addresses a global perspective on the U.S.; see part 2(b) of the major for sample courses.
3. *Electives* (6 credit hours)

Two courses pre-approved to form a plan of concentration. See below for a list of approved courses.

Honors Program

The Honors Program in American Studies offers superior students a more intensive concentration within their major field. The program requires:

1. Completion of the requirements of the major.
2. A 3.3 cumulative grade point average.
3. A 3.5 cumulative grade point average in American Studies.
4. 6 credit hours in the fall and spring semesters of the senior year in AMER 4998/4999 devoted to a major research project leading to an honors thesis. 4999 counts as the Senior Project (4960), and 4998 counts as elective credit for the requirements of the major.
5. An Honors thesis to be completed by the spring of the senior year.
6. Successful completion of an oral examination on the topic of the thesis.

Exceptional achievement on the thesis will earn highest honors. Applications are accepted in March of the junior year. Additional information is available from the director of the American Studies program.

General Advice for Majors and Minors

We encourage students to enter the major through a number of avenues: a First-Year Writing Seminar, our introductory course to the major, AMER 1002/1002W, or an introductory course in a particular discipline or program. Up to 6 credit hours of introductory courses can count toward the major.

Once having declared a major or minor, students should work closely with their adviser to develop a coherent plan of study. We encourage students to concentrate on a theme or topic of special interest, either by choosing courses with a topical coherence each semester or by choosing a single thematic

focus or scholarly problem. We also highly encourage our majors to seek opportunities for study abroad or internship possibilities. Students may take the American Studies Workshop at any time during their career in order to facilitate their progress towards the capstone course, the Senior Project, during their senior year. Distributional requirements and electives should be selected in close conjunction with the adviser.

We also encourage our students to participate in American Studies programming that occurs outside the classroom: visiting speakers as well as our Road Trips, City Walks, and Beyond the Headlines series.

Please consult the American Studies program website for detailed descriptions of courses. For all 1111, special topic, and independent study courses, the course must be on an American topic, as approved by the director of the American Studies program. *Note:* 1111 in all departments receives credit when an American topic is offered.

Approved List of Courses

INTERDISCIPLINARY PROGRAMS

AFRICAN AMERICAN AND DIASPORA STUDIES: 1010, Introduction to African American and Diaspora Studies; 1016, Race Matters; 3104W, Soul Food as Text in Text: An Examination of African American Foodways; 3206, Mystery, Murder, and Mayhem in Black Detective Fiction; 3214, Black Masculinity: Social Imagery and Public Policy; 3258, Black Issues in Education.

AMERICAN STUDIES: 1111, First-Year Writing Seminar; 3851, Independent Readings and Research; 3852, Independent Readings and Research; 3881, Internship Readings and Research; 3890, Topics in American Studies; 4100, Undergraduate Seminar in American Studies; 4998, Senior Honors Research; 4999, Senior Honors Thesis.

CINEMA AND MEDIA ARTS: 1600, Introduction to Film and Media Studies.

JEWISH STUDIES: 2280/2280W, Jewish Humor; 2400, American Jewish Life; 2420W, American Jewish Music; 2560, Social Movements in Modern Jewish Life; 3830, Contemporary Jewish Issues.

LATIN AMERICAN STUDIES: 2601, Latin America, Latinos, and the United States.

MEDICINE, HEALTH, AND SOCIETY: 1930, Fundamental Issues in Medicine, Health, and Society; 3020, U.S. Public Health Ethics and Policy; 3150, Death and Dying in America; 3890, Special Topics.

WOMEN'S AND GENDER STUDIES: 2243, Sociologies of Men and Masculinity; 2248, Humor and Cultural Critique in Fannie Flagg's Novels; 2249, Women and Humor in the Age of Television; 2259/2259W, Reading and Writing Lives; 2268, Gender, Race, Justice, and the Environment; 3246W, Women's Rights, Women's Wrongs; 3250/3250W, Contemporary Women's Movements; 3271, Feminist Legal Theory; 3891, Special Topics: Topics in Gender, Culture, and Representation; 3893, Selected Topics (when an American topic is offered).

ELECTIVES

ANTHROPOLOGY: 2105, Race in the Americas.

ART: 1099, Maymester Contemporary Art Blitz (when U.S. city/art).

CLASSICAL STUDIES: 3000, Classical Tradition in America.

COMMUNICATION STUDIES: 2800, Rhetoric and Civic Life; 2950, Rhetoric of Mass Media; 3000, Rhetoric of the American Experience, 1640–1865; 3001, Rhetoric of the American Experience, 1865 to 1945; 3002, Rhetoric of the American Experience, 1945–Present; 3100, Rhetoric of Social Movements; 3110, Women, Rhetoric, and Social Change; 3700, Politics and Mass Media; 3720, Communicating Gender; 3890, Selected Topics in Communication Studies; 4940–4941, Seminars in Selected Topics.

ECONOMICS: 2100, Labor Economics; 2150, Economic History of the United States; 2890, Special Topics; 3100, Wages, Employment, and Labor Markets; 3150, Topics in the Economic History of the U.S.

ENGLISH: 2316, 2316W, Representative American Writers; 2320, Southern Literature; 3620, Nineteenth-Century American Literature; 3622, Nineteenth-Century American Women Writers; 3624W, Literature of the American Civil War; 3640, Modern British and American Poetry: Yeats to Auden; 3642, Film and Modernism; 3644, Jewish American Literature; 3644–3645, Twentieth-Century American Novel; 3646, Poetry since World War II; 3650, 3650W, Ethnic American Literature; 3654, 3654W, African American Literature; 3658, Latino-American Literature; 3662, 3662W, Asian American Literature; 3674, Caribbean Literature; 3680–3681, Twentieth-Century Drama; 3692, Desire in America: Literature, Cinema, and History; 3694, America on Film: Art and Ideology; 3695, America on Film: Performance and Culture; 3710–3711, Literature and Intellectual History (when an American topic is offered); 3746, Workshop in English and History; 3890, 3890W, Movements in Literature (when an American topic is offered); 3892, 3892W, Problems in Literature (when an American topic is offered); 3894, 3894W, Major Figures in Literature; 3896, Special Topics in Investigative Writing in America; 3898, 3898W, Special Topics in English and American Literature (when an American topic is offered); 3899, Special Topics in Film.

HISTORY: 1390, America to 1776: Discovery to Revolution; 1400, U.S. 1776–1877: Revolution to Civil War and Reconstruction; 1410, U.S. 1877–1945: Reconstruction through World War II; 1420, U.S. Post-1945: Cold War to the Present; 1427W, America in the Seventies; 1430W, American Indians and the Environment; 1440, African American History since 1877; 1660, American Enterprise; 1690, Sea Power in History; 1730, The U.S. and the Cold War; 1740, The U.S. and the Vietnam War; 2535, Latin America and the United States; 2580, American Indian History before 1850; 2590, American Indian History since 1850; 2610, The Founding Generation; 2620, The Old South; 2630, The New South; 2640, Appalachia; 2662, American Slavery; 2690, The Civil Rights Movement; 2691, Barack Obama: Man and President; 2700, The U.S. and the World; 2710, The U.S. as a World Power; 2721, Globalizing American History, 1877–1929; 2730, American Masculinities; 2749, American Intellectual History to 1865; 2750, American Intellectual History since 1865; 2800, Modern Medicine; 2810, Women, Health, and Sexuality; 2840, Sexuality and Gender in the Western Tradition since 1700; 3010, Pornography and Prostitution in History; 3040, Health and the African American Experience; 3140, History of New Orleans; 3170, The Federalist Papers; 3746, Workshop in English and History; 3890, Selected Topics in History (when an American topic is offered); 4960, Majors Seminar (when an American topic is offered).

HISTORY OF ART: 2660, American Art to 1865; 2720, Modern Architecture; 2760, Early American Modernism, 1865–1945; 2765, Art since 1945; 3735, History of Photography; 4960, Advanced Seminar (when an American topic is offered).

MUSIC LITERATURE AND HISTORY: 1600, American Popular Music; 1610, Musical Theatre in America: A Cultural History; 1620, Survey of Jazz; 1630, The Blues; 1640, Country Music; 1650, History of Rock Music; 2150, Music, Identity, and Diversity; 2320, Exploring the Film Soundtrack; 2600, American Music; 2610, Music of the South.

OTHER MUSIC COURSES: 1300, Music and the Fall of Segregation.

PHILOSOPHY: 2104, Nineteenth-Century Philosophy; 2110, Contemporary Philosophy; 3008, American Philosophy; 3603, Philosophy of Education; 3623, Modern Philosophies of Law.

POLITICAL SCIENCE: 1100, Introduction to American Government and Politics; 1150, U.S. Elections; 2222, American Foreign Policy; 2240, Political Parties; 2243, Political Campaigns and the Electoral Process; 2245, The American Presidency; 2255, Public Policy Problems; 2262, The Judicial Process; 2263, Religion and Politics; 2265, Constitutional Law: Powers and Structures of Government; 2266, Constitutional Law: Civil Liberties and Rights; 3241, American Public Opinion and Voting Behavior; 3244, The Legislative Process; 3247, American Political Culture; 3249, American Political Thought; 3250, Group Conflict and Cooperation in U.S. Politics; 3260, Introduction to American Law; 3272W, The War in Iraq, 2003–2011; 3891, Topics in Contemporary Politics; 3893, Selected Topics of American Government; 3897, Selected Topics (when an American topic is offered).

RELIGIOUS STUDIES: 1100, Introduction to African American Religious Traditions; 1190W, Introduction to Southern Religion and Culture; 3119, Martin Luther King, Jr., and the Social Roles of Religion; 3142, Slave Thought and Culture in the American South; 3304W, Evangelical Protestantism and the Culture Wars.

SOCIOLOGY: 3201, Cultural Consumption and Audiences; 3204, Tourism, Culture, and Place; 3207, Popular Culture Dynamics; 3221, The Family; 3222, Sociology of Religion; 3223, Schools and Society: The Sociology of Education; 3233, Contemporary American Society; 3301, Society and Medicine; 3322, Immigration in America; 3601, Self, Society, and Social Change; 3602, Change and Social Movements in the Sixties; 3603, Women and Social Activism; 3604, American Social Movements; 3611, Women and the Law; 3616, Women and Public Policy in America; 3621, Criminology; 3622, Delinquency and Juvenile Justice; 3624, Prison Life; 3702, Racial and Ethnic Minorities in the United States; 3722, Gender in Society; 3724, Gender Identities, Interactions, and Relationships; 4961, Seminars in Selected Topics (when an American topic is offered).

SPANISH AND PORTUGUESE: 3375, Film and Culture in Latin America; 3835, Latino Immigration Experience; 4750, Afro-Hispanic Literature.

THEATRE: 1811, Marshals, Mobsters, Monsters, Magnums, and Musicals: American Movie Genres; 2204, Histories of Theatre and Drama III: The U.S. Stage.

Course descriptions begin on page 149.

Anthropology

CHAIR Beth A. Conklin

DIRECTOR OF UNDERGRADUATE STUDIES Markus Eberl

DIRECTOR OF GRADUATE STUDIES John W. Janusek

PROFESSORS EMERITI Thomas A. Gregor, Ronald Spores

PROFESSORS Arthur A. Demarest, Tom D. Dillehay, Edward F. Fischer, Lesley Gill

RESEARCH PROFESSOR Charles E. Orser Jr.

ASSOCIATE PROFESSORS Jada Benn-Torres, Beth A. Conklin, Markus

Eberl, William R. Fowler Jr., T. S. Harvey, John W. Janusek, Norbert

Ross, Tiffany A. Tung, Steven A. Wernke

RESEARCH ASSOCIATE PROFESSOR Patricia Netherly

ASSISTANT PROFESSORS Carwil Bjork-James, Gabriel Torres Colón

ASSISTANT PROFESSOR OF THE PRACTICE Sophie Bjork-James

RESEARCH ASSISTANT PROFESSORS Teresa Franco, Arina Guengerich,

Jacob J. Sauer

SENIOR LECTURER Mareike Sattler

ANTHROPOLOGY is the study of human diversity in all times and places. It brings together perspectives from the sciences and humanities to illuminate different aspects of the human past, the human body, and contemporary social life. Global perspectives, fieldwork and experiential learning, and concerns with ethics, justice, and social well-being are hallmarks of anthropology. Vanderbilt's program has a strong research focus on Latin America and historically marginalized groups, especially indigenous people and descendants of the African diaspora.

Students majoring in anthropology take courses in several subfields, each of which looks at humanity from a different perspective. Cultural anthropology examines the relationships, beliefs, values, and political-economic practices that shape individual behavior, community life, and power in society. Archaeology studies past cultures through their material remains. Linguistics explores relations between language and culture. Biological anthropology examines topics such as community health in the past and present, forensic science,

genetics, evolution, human biology, and bioethics. Courses cluster around themes of cross-cultural health, biology, food, and medical systems; inequality, power, and social-political relations; material culture, human-environment relations, and spatial analysis; religion and politics; and worldviews, language, and cognition. Unless indicated otherwise in the course description, anthropology courses have no prerequisites and are open to all majors and non-majors.

Knowledge of the diversity of human histories and life-ways is vital to imagining alternative paths to a better society. Anthropology develops this knowledge through experiential learning that challenges students to go beyond the familiar, to see, understand, create, and interact in new ways. This preparation is useful in all professional careers that involve understanding human behavior, working with people from different backgrounds, analyzing complex information, and thinking holistically about the conditions that shape people's lives.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Anthropology

The major in anthropology requires completion of at least 30 credit hours of course work, as follows:

1. **6 credit hours.** Two 1000-level surveys selected from the subfields of anthropology: 1101 (Cultural Anthropology), 1201 (Archaeology), 1301 (Biological Anthropology), 1601 (Linguistic Anthropology). A course in a third subfield is strongly recommended (in consultation with the adviser).
2. **3 credit hours.** A seminar on anthropological theory (2101 or 2102). The seminar may not be used to count toward theme credit below.
3. **3 credit hours.** A course on anthropological methods; this class may not count towards the theme requirement. Courses that satisfy the methods requirement include 2211, 2603, 3120, 3150, 3260, 3261, 3262, 3372, 3866, 4373, 5112, 5604. Other anthropology courses can count in consultation with the adviser.
4. **12 credit hours.** Students take four upper-level courses from a predesigned theme or from a theme that they design in consultation with their adviser:
 - A. Environment, landscape, and place (2109, 2113, 2114, 2150, 2160, 2214, 2220, 2221, 2222, 2225, 2227, 3121, 3138, 3200, 3240, 3250, 4154, 4155)
 - B. Healing, medicine, and culture (2113/W, 2227, 2342, 2370, 3121, 3125, 3138, 3143, 3144, 3145, 3343, 3344, 3345, 3346, 3371, 3372, 4345, 4373)
 - C. Social politics and power (2105, 2106, 2108, 2109, 2110, 2130, 2242, 2342, 2375, 3121, 3122, 3125, 3130, 3132, 3133, 3134, 3135, 3138, 3161, 3162, 3241, 3232, 3243, 3250, 3343, 3345, 4152, 4153)
 - D. Identity, ethnicity, gender (2105, 2110, 2113W, 2160/W, 2227, 2375, 3144, 3145, 3343)
 - E. Biocultural foundations in health, genetics, forensics, and ethics (2227, 2342, 2370, 2371, 3138, 3141, 3143, 3344, 3345, 3446, 3371, 3372, 4345, 4373)

F. Language, cognition, and culture (2601, 2602, 2603, 3140, 3150/W, 3243/W, 3620, 3622/W, 4155, 5614, 6614, 6615)

5. *3 credit hours.* One capstone experience in engaged anthropology. In consultation with their adviser, students may fulfill this requirement by taking a formal course (3122 and 3125) or by completing an independent study. Formal classes may not count toward both the theme requirement and the capstone experience.
6. Minimum 3 credit hours of electives chosen from ANTH courses not already used to satisfy the requirements listed above, to total 30 credit hours toward the major.
7. With the approval of the student's major adviser, a maximum of 3 credit hours for a course taken in another department or program may be counted toward the major requirement. A variety of courses is possible, including but not limited to those listed below. In each case, the course must be relevant to the student's program and the student must receive the approval of the director of undergraduate studies.
 - African American and Diaspora Studies 2178, 3178; Biological Sciences 2205; History 1270, 2490; History of Art 1330, 2210; Latin American Studies 2301, 2601; Mathematics 1010, 1011; Medicine, Health, and Society 1930, 2130, 2240, 2250, 2420, 2430, 3010, 3020, 3110, 3140, 3150, 3210, 3212, 3220, 3250; Music Literature 1100, 1105, 2110; Religious Studies 4554; Sociology 3001, 3221, 3232, 3311, 3313, 3314; Spanish 3360.

Honors Program

The Honors Program in Anthropology is designed to afford superior students the opportunity to pursue more intensive work within the major field. Students who want to do honors work in anthropology should contact the director of the Honors Program in the first semester of their junior year. The completion of the Honors Program requires: a) 4–5 credit hours in Anthropology 4998 (Honors Research), evaluated by honors thesis adviser, b) 4–5 credit hours in Anthropology 4999 (Honors Thesis), evaluated by honors thesis adviser, c) submission of a written thesis, evaluated by the student's honors committee, d) an oral presentation of the thesis (15–20) minutes, evaluated by the student's honors committee, e) an oral examination of the thesis, administered by the student's honors committee. The Honors Thesis hours are expected to be in excess of the 30 credit hours required for the anthropology major.

Minor in Anthropology

The minor in anthropology requires 18 credit hours of course work, as follows:

1. *3 credit hours.* One introductory course from one of the four subfields in Anthropology: 1101 (cultural anthropology), 1301 (biological anthropology), 1201 (archaeology), 1601 (linguistics).
2. *3 credit hours.* One methods or one theory course listed in the major; see above.
3. *12 credit hours.* Four courses from a theme in the major designed in consultation with the adviser; see above.

Course descriptions begin on page 150.

Arabic

SENIOR LECTURERS M. Issam Eido, Bushra Hamad

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 154.

Art

CHAIR Mark Hosford
 DIRECTOR OF UNDERGRADUATE STUDIES Mel Ziegler
 PROFESSORS EMERITI Michael Aurbach, Marilyn L. Murphy
 PROFESSORS Maria Magdalena Campos-Pons, Mel Ziegler
 ASSOCIATE PROFESSORS Mark Hosford, Vesna Pavlović
 ASSOCIATE PROFESSOR OF THE PRACTICE Jana Harper
 MELLON ASSISTANT PROFESSOR Alejandro Acierito
 PRINCIPAL SENIOR LECTURER, RETIRED Susan DeMay
 SENIOR LECTURER Farrar Hood Cusomato
 LECTURERS Alex Blau, John Donovan, Patrick DeGuira, John Warren
 Affiliated Faculty
 PROFESSOR David Wood (Philosophy)
 ASSOCIATE PROFESSOR Jonathan Rattner

COURSES in art are offered in a variety of media, which provide wide-ranging methods and perspectives. Our courses emphasize creative and critical approaches to learning.

Many students will use the program in art as a foundation for careers in which creativity and visual studies are especially valued, as the basis for advanced training in professional schools (such as art, architecture, museum studies), and for employment in galleries, museums, commercial art, or design-related fields. An important goal of the department is to help students become readers of the rich visual environment in our culture throughout their lives, as well as to encourage creative approaches to learning in all disciplines.

The Department of Art offers several opportunities for extracurricular activities in the arts. The department offers a student-run art gallery. Our Space 204 arts laboratory has exhibitions and workshops all year long. Studio VU lecture series brings some of the most important artists working today to campus for lectures and one-on-one studio visits with students.

Since 1984 the department has supervised the awarding of the Margaret Stonewall Wooldridge Hamblet Award to an eligible senior art major. The Hamblet Award provides the means for travel and independent art activity for one year, culminating in a one-person exhibition at Vanderbilt. Our immersive program includes both junior and senior major trips to New York and other important art destinations.

Many other prizes are awarded in our department. The Allan P. Deloach Memorial Prize in Photography was established in 2000 in memory of Allan Deloach (B.A. 1963) by two of his colleagues at IBM. This cash award is open to any student

who has taken a studio class in any discipline at Vanderbilt. Midsouth Ceramics awards are given to the top three ceramic projects in the annual open house, and the Plaza Artists Materials award is given to four students each year. All competitions are judged by outside professional artists.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Art

The art major requires 36 credit hours and presents our students the opportunity to explore their ideas conceptually, as well as to learn the technical skills involved in the creation of art. The program offers a wide range of classes and media. Our students are offered a strong grounding in traditional processes such as drawing, painting, ceramics, and sculpture, as well as the opportunity to explore contemporary processes involving video, performance, digital photographic media, installation, and social interactive art practice. Our diverse faculty of artist/educators represents a wide range of teaching styles and aesthetic philosophies. We consider how ideas have been developed through the centuries as well as how specific techniques have been used to enrich the expression of the idea. In addition to modern art history offerings, art majors are encouraged to take courses in pre-Renaissance, non-Western art history, philosophy of aesthetics, and film. The Contemporary Art Maymester offers an opportunity to study contemporary art in a concentrated manner.

Requirements for the Program of Concentration in Art

Foundation Requirement (6 credit hours)

- 1101 and 1102

Studio Requirements (15 credit hours), which must include at least:

- One 2-D course (ARTS 1600, 1601, 1503, 1200, 1201, 1202, 1300, 2100, 2101, 2102, 2600, 3600, 2200, 3200, 2202, 2300, 3101, 3102, 3300)
- One 3-D course (ARTS 1400, 1401, 1500, 1501, 1502, 2400, 2401, 2500)
- One time-based course (ARTS 1700, 1701, 1702, 2700, 2701, 2702)

Within the 15 credit hours, students must take at least one 2000-level or higher ARTS course.

Related Requirement (9 credit hours), which must include one course (3 credit hours) of each of the following:

- Either HART 1100 or 1105 (suggested for entry into 2000-level HART courses)
- ARTS 1800
- 2000-level HART course or one course from the following: ARTS 1099, 3891, CMA 1600, 2300, PHIL 3014

Department highly recommends taking ARTS 1800 Sources of Contemporary Art course prior to senior year.

Directed Study (6 credit hours)

- 3970, Directed Study: Senior Show and Contemporary Practices
- 3971, Independent Research: Senior Show

Majors are required to complete the Independent Research course, ARTS 3971, their senior year. This course is designed specifically to help prepare majors for their Senior Show, and is typically taken in the second semester of the senior year. No other independent research/study course may be counted toward the major.

Honors Program in Art

The Honors Program in the Department of Art offers excellent art majors the opportunity to pursue their interest at a higher level. To be admitted to the Honors Program in Art, students must have:

- At least a 3.30 cumulative GPA.
- At least a 3.5 GPA in courses that count toward the major in art.
- Completed the sophomore year.

Students interested in pursuing the honors program should contact the director of undergraduate studies. Application materials must be submitted to the director of undergraduate studies in the applicant's junior year; applications may be submitted electronically. Applications must include ten digital images of recent work with written explanations of each image. Applicants will be notified in writing of the department's decision.

Each honors student shall have a committee consisting of one faculty member appointed by the department chair, the student's selected honors adviser, and the director of undergraduate studies.

Requirements for graduation with honors in art:

1. Successful completion of the requirements for the major in art.
2. During the senior year the student is required to register for ARTS 4998 (3 credit hours) in the first semester and 4999 (3 credit hours) in the second semester in order to complete a written thesis, expanding concepts explored in the senior exhibition.
3. Successful oral defense of the thesis and senior exhibition during the final semester of undergraduate study.
4. At least a final 3.30 cumulative GPA.
5. At least a final 3.5 GPA in courses that count toward the major in art.

Minor in Art

The minor in art requires 18 credit hours of course work, including the following:

- HART 1105 or ARTS 1800;
- ARTS 1102 (Drawing and Composition I); and four other ARTS courses, with at least one at the 2000-or-higher level.

Course descriptions begin on page 154.

Asian Studies

DIRECTOR Gerald Figal
 PROFESSORS Robert Company, Gerald Figal
 ASSOCIATE PROFESSOR Ben Tran
 ASSISTANT PROFESSORS Guojun Wang, We Jung Yi
 PRINCIPAL SENIOR LECTURER Xianmin Liu
 SENIOR LECTURER EMERITUS James Auer
 SENIOR LECTURERS Seok Bae Jang, Elliott McCarter, Hideko Shimizu
 LECTURERS Divya Chaudhry, Yinghui Guo, Nozomi Imai, Jing Liu, Asami Nakano, Qing Wei

Affiliated Faculty

PROFESSORS Yoshikuni Igarashi (History), Tony K. Stewart (Religious Studies)
 ASSOCIATE PROFESSORS Brett Benson (Political Science), Peter Lorge (History), Tracy Miller (History of Art), Ruth Rogaski (History), Samira Sheikh (History), Lijun Song (Sociology and Medicine, Health, and Society), Tariq Thachil (Political Science)
 ASSISTANT PROFESSORS Bohyeong Kim (Communication Studies), Adeana McNicholl (Religious Studies), Akshya Saxena (English), Haerin Shin (English), Heeryoon Shin (History of Art), Anand V. Taneja (Religious Studies)
 WRITER IN RESIDENCE Piyali Bhattacharya (English)

THE Program in Asian Studies provides students with a foundation in the languages, cultures, and societies of Asia necessary to pursue a career among a wide host of global companies, institutions, and agencies that do business in the United States and abroad with the many countries of Asia. Rich in diverse and ancient histories and cultures, present-day Asia and its peoples are at the center of the global future. The Program in Asian Studies equips its students with the linguistic competence and cultural knowledge to join in that global future, whether it be as a foreign press correspondent, investment banker, video game designer, translator/interpreter, educator, diplomat, tour operator, ad firm consultant, or traditional Chinese medicine practitioner. With the intensive study of modern Asian languages at its core, the program embraces a wide variety of courses in the art, culture, economics, history, film and media, politics, religion, medicine, and sociology of East Asia, South Asia, and Southeast Asia. Through their teaching and research, faculty members promote a better understanding of multiple facets of life in Asia and the region's relationship with the rest of the world, past and present.

Majors and minors are strongly encouraged to complete a study abroad program in Asia. Up to 6 credit hours of Asia-related courses from Vanderbilt-approved study abroad programs may be applied toward the major or minor upon approval of the director of the Program in Asian Studies or director of undergraduate studies. Students should consult with the director or DUS before applying to a study abroad program.

Program of Concentration in Asian Studies

The major in Asian studies requires a minimum of 36 credit hours of course work and is designed to ensure that graduates have both depth and breadth in their understanding of Asia.

For the major in Asian studies, students must formally declare an area of concentration at the time the major is declared (China, Japan, or South Asia) and complete at least 36 credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in an Asian language taught in the Program in Asian Studies at the 3301 (Advanced I) level or above. Asian languages not offered by the Asian studies program require the approval of the program director or the director of undergraduate studies.
2. At least 9 non-language credit hours of courses in area of concentration.
3. At least 6 non-language credit hours of courses eligible for Asian Perspectives.
4. Up to 18 credit hours of courses in any Asian language offered by the Program in Asian Studies may be applied to the total 36 credit hours.

Advanced Placement credits in language do not count toward credit hours required for the major or minors, but can figure into the assessment of initial placement within a language track.

Honors Program in Asian Studies

In addition to following the requirements set by the College of Arts and Science, the following must be satisfied:

1. All of the requirements for the major in Asian studies.
2. 3 credit hours of ASIA 3980 Juniors Honors Readings. If ASIA 3980 is not offered, this requirement may be substituted by an alternative course, with approval by the Asian studies program director or the director of undergraduate studies.
3. ASIA 4998 (3 credit hours) and 4999 (3 credit hours). Honors Research must be taken while in residence at Vanderbilt. The candidate will write an honors thesis while completing the two-semester Honors Research sequence. The honors thesis is a research paper on a topic defined by the student in consultation with the faculty adviser and approved in advance by the Honors Committee (see below for definition of Honors Committee).
Note: 3980, 4998, and 4999 may count toward the 36 credit hours required for the major.
4. A minimum 3.30 cumulative grade point average with a minimum 3.50 grade point average in courses that count toward the major in Asian studies upon completion of the Honors requirements.
5. An oral examination on the thesis typically scheduled within the two months prior to graduation.

Study abroad in a country relevant to the Honors Research project is strongly recommended.

A three-member Honors Committee of Asian studies faculty administers the Honors Program. The committee will set guidelines for the thesis topic proposal, publish deadlines each year, and administer the oral examination. Students submit the name of the faculty adviser and the proposed thesis topic to this committee for approval early in the second semester of the junior year. If the student is studying abroad that semester, the proposed thesis topic should be submitted in the first semester of the junior year, or arrangements should be made to submit the thesis topic from abroad during the second semester of the junior year.

Minor in Asian Studies

The minor in the Program in Asian Studies provides a broad knowledge of the languages, literatures, politics, histories, film

and media, arts, and religions of China, Japan, Korea, and South Asia. Students cannot combine the Asian studies minor with other minors within the Program in Asian Studies.

For the minor in Asian studies, students must complete at least 17 credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 5 credit hours in any Asian languages taught in the Asian studies program at the 2201 (Intermediate I) level or above
2. At least 6 credit hours of History Survey Courses
3. At least 3 credit hours of Humanities Courses
4. At least 3 credit hours of Social Sciences Courses
5. Up to 5 credit hours of any Asian language courses taught in the Asian studies program may be applied to the total 17 credit hours

Minor in Chinese Language and Culture

The minor in Chinese language and culture is anchored by a firm foundation in language study that is complemented by electives in art, history, literature, film and media, politics, and religion. Students cannot combine the Chinese language and culture minor with other minors within the Asian studies program.

For the minor in Chinese language and culture, students must complete at least 18 total credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in Chinese language at the 3301 (Advanced I) level or above
2. At least 15 credit hours of courses from China Concentration
3. Up to 13 credit hours of Chinese language courses may be applied to the total 18 credit hours

Minor in Japanese Language and Culture

The minor in Japanese language and culture is anchored by a firm foundation in language study that is complemented by electives in art, history, literature, film and media, politics, and religion. Students cannot combine the Japanese language and culture minor with other minors within the Asian studies program.

For the minor in Japanese language and culture, students must complete at least 18 total credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in Japanese language at the 3301 (Advanced I) level or above
2. At least 15 credit hours of courses from Japan Concentration
3. Up to 13 credit hours of Japanese language courses may be applied to the total 18 credit hours

Minor in Korean Language and Culture

The minor in Korean language and culture is anchored by a firm foundation in language study that is complemented by electives in history, literature, film, and media. Students cannot combine the Korean language and culture minor with other minors within the Asian studies program.

For the minor in Korean Language and Culture, students

must complete at least 18 total credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in Korean language at the 3301 (Advanced I) level or above
2. At least 15 credit hours of courses from Korean Concentration
3. Up to 13 credit hours of Korean language courses may be applied to the total 18 credit hours

Minor in South Asian Language and Culture

The minor in South Asian language and culture is anchored by a firm foundation in language study that is complemented by electives in art, history, literature, film and media, politics, and religion. Students cannot combine the South Asian language and culture minor with other minors within the Asian studies program.

For the minor in South Asian language and culture, students must complete at least 18 total credit hours from the Asian Studies Course List (see below), according to these rules:

1. At least 3 credit hours in Hindi-Urdu language at the 3301 (Advanced I) level or above
2. At least 15 credit hours of courses from South Asia Concentration
3. Up to 13 credit hours of Hindi-Urdu language courses may be applied to the total 18 credit hours

Asian Studies Course List

All courses on this list count toward the credit-hour requirements for the major and the minors within the Program in Asian Studies. Their eligibility for specific requirements within the major and minors is indicated by the following codes:

China Concentration = CC
 Japan Concentration = JC
 Korea Concentration = KC
 South Asia Concentration = SA
 Asian Perspectives = AP
 History Survey Course = HS
 Humanities Course = HU
 Social Science Course = SS

Any given course may be applied to only one category of requirement even if it may be eligible for more than one. Courses marked with an * require approval from the Asian studies program director or director of undergraduate studies.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Chinese Language Courses

CHIN 1011. Basic Chinese (CC)
 CHIN 1012. Basic Chinese (CC)
 CHIN 1101. Elementary Chinese I (CC)
 CHIN 1102. Elementary Chinese II (CC)
 CHIN 1231. Calligraphy (CC, HU)
 CHIN 2201. Intermediate Chinese I (CC)
 CHIN 2202. Intermediate Chinese II (CC)
 CHIN 2211. Chinese for Heritage Learners I (CC)
 CHIN 2212. Chinese for Heritage Learners II (CC)
 CHIN 3301. Advanced Chinese I (CC)
 CHIN 3302. Advanced Chinese II (CC)
 CHIN 3302W. Advanced Chinese II (CC)
 CHIN 3851. Independent Study (CC)*

CHIN 3852. Independent Study (CC)*
 CHIN 4401. Business Chinese I (CC)
 CHIN 4402. Business Chinese II (CC)
 CHIN 4403. Readings in Modern Chinese Media (CC)
 CHIN 4404. Readings in Modern Chinese Media (CC)
 CHIN 4405. Classical Chinese Literature and Philosophy. (CC, HU)
 CHIN 4406. Readings in Modern Literary Chinese (CC, HU)

Hindi-Urdu Language Courses

HNUR 1101. Elementary Hindi-Urdu I (SA)
 HNUR 1102. Elementary Hindi-Urdu II (SA)
 HNUR 2201. Intermediate Hindi-Urdu I (SA)
 HNUR 2202. Intermediate Hindi-Urdu II (SA)
 HNUR 3301. Advanced Hindi-Urdu I (SA)
 HNUR 3302. Advanced Hindi-Urdu II (SA)
 HNUR 3851. Independent Study (SA)*
 HNUR 3852. Independent Study (SA)*

Japanese Language Courses

JAPN 1011. Basic Japanese I (JC)
 JAPN 1012. Basic Japanese II (JC)
 JAPN 1101. Elementary Japanese I (JC)
 JAPN 1102. Elementary Japanese II (JC)
 JAPN 1231. Tadoku: Extensive Reading in Japanese
 JAPN 2201. Intermediate Japanese I (JC)
 JAPN 2202. Intermediate Japanese II (JC)
 JAPN 2232. Japanese through Manga (JC)
 JAPN 3301. Advanced Japanese I (JC)
 JAPN 3302. Advanced Japanese II (JC)
 JAPN 3851. Independent Study (JC)*
 JAPN 3852. Independent Study (JC)*
 JAPN 3891. Special Topics in Advanced Japanese (JC)

Korean Language Courses

KOR 1101. Elementary Korean I (KC)
 KOR 1102. Elementary Korean II (KC)
 KOR 2201. Intermediate Korean I (KC)
 KOR 2202. Intermediate Korean II (KC)
 KOR 3301. Advanced Korean I (KC)
 KOR 3302. Advanced Korean II (KC)

Sanskrit Language Courses

SNSK 1101. Elementary Sanskrit I (SA, AP)
 SNSK 1102. Elementary Sanskrit II (SA, AP)

Asian Studies

ASIA 1111. First-Year Writing Seminar
 ASIA 1201. Writing Southeast Asia (AP, HU)
 ASIA 1680. Inside China (CC, SS)
 ASIA 1682. Chinese Culture through Tai Chi and Qi Gong (CC)
 ASIA 1881W. The Body in Modern Japanese Culture (JC, HU)
 ASIA 2100W. Fashioning the Self: Coming of Age and Asian Modernities (AP, HU)
 ASIA 2210W. Hollywood Hanoi (AP, HU)
 ASIA 2302. Popular Culture of South Asia (SA)
 ASIA 2411. Cultural History of Korea (KC, HS)
 ASIA 2412. Global Korean Cinema (KC, AP, HU)
 ASIA 2413. History of Modern Korea (KC, HS)
 ASIA 2414. Food and Family in Korean Pop Culture (KC, HU)
 ASIA 2511. Popular Culture in Modern Japan (JC, HU)
 ASIA 2512. Explorations of Japanese Animation (JC, HU)
 ASIA 2513W. Media Monsters in Contemporary Japan (JC, HU)
 ASIA 2560. Current Japan-U.S. Relations (JC, SS)
 ASIA 2605. Romancing the Nation in Modern Chinese Literature (CC, HU)
 ASIA 2606. Martial Tradition in Chinese Literature (CC, HU)
 ASIA 2607. Self and Society in Pre-modern Chinese Literature (CC, HU)
 ASIA 2608. Chinese Drama: 13th to 20th Centuries (CC, HU)
 ASIA 2609W. Writing and Gender in Traditional China (CC, HU)
 ASIA 2630. Chinese Medicine (CC, SS)
 ASIA 3151. The Third World and Literature (AP, HU)
 ASIA 3155. Blackness and the Asian Century (AP, HU)

ASIA 3633. Self-Cultivation in Ancient China (CC, HU)
 ASIA 3851. Independent Study*
 ASIA 3852. Independent Study*
 ASIA 3891. Special Topics*
 ASIA 3892. Special Topics*
 ASIA 3980. Junior Honors Readings*
 ASIA 4998. Honors Research*
 ASIA 4999. Honors Research*

Cinema and Media Arts

CMA 3892. Special Topics in the Study of Film*

English

ENGL 1210W. Prose Fiction: Forms and Techniques (as appropriate)*
 ENGL 1260W. Introduction to Literary and Cultural Analysis (as appropriate)*
 ENGL 2319W. World Literature, Modern (as appropriate)*
 ENGL 3662. Asian American Literature (AP, HU)*
 ENGL 3681. Colonial and Post-Colonial Literature (as appropriate)*

History

HIST 1050. East Asia since 1800 (AP, SS, HS)
 HIST 1060. Premodern China (CC, SS, HS)
 HIST 1070. China from Empire to the People's Republic (CC, SS, HS)
 HIST 1080. Premodern Japan (JC, SS, HS)
 HIST 1090. Modern Japan (JC, SS, HS)
 HIST 1160. Modern South Asia (SA, SS, HS)
 HIST 1161. India Before Europe: 3000 B.C.E.–1750 C.E. (SA, SS, HS)
 HIST 1881. The Body in Modern Japanese Culture (JC, HU)
 HIST 1882W. Japan Through Historical Fiction (JC, HU)
 HIST 2100. Politics and Catastrophe in Modern China (CC, SS)
 HIST 2105. Chinese Thought (CC, HU)
 HIST 2106. A Global History of Tea (AP, SS)
 HIST 2110. Crisis Simulation in East Asia (AP, SS)
 HIST 2111. China and the United States: Intertwined Histories (AP, CC, SS)
 HIST 2115. Play and Pleasure in Early Modern Japan (JC, HU)
 HIST 2119. The Pacific War in Cinematic Memory (JC, HU)
 HIST 2120. Japan's War and Postwar, 1931–1989 (JC, SS)
 HIST 2140. The Mughal World (SA, SS)
 HIST 2145. Religion and Politics in South Asia (SA, SS)
 HIST 2150. India and the Indian Ocean (SA, AP, SS)
 HIST 3090 Tokyo: History and Image (JC, SS)
 HIST 3112W. China and the World (CC, AP, SS)
 HIST 3220W. Images of India (SA, HU)

History of Art

HART 1200. Arts of East Asia (AP, HU)
 HART 1205. Arts of South and Southeast Asia (SA, AP, HU)
 HART 1210W. Art and Ritual in Asia (AP, HU)
 HART 1220. History of Asian Architecture (AP, HU)
 HART 2100. Architecture and the Mapping of Empire in Asia (AP, HU)
 HART 2110. Arts of China (CC, HU)
 HART 2120. Arts of Korea (KC, HU)
 HART 2130. Arts of Japan (JC, HU)
 HART 2150. East Asian Architecture and Gardens (AP, HU)
 HART 2170. Religion and Politics in South and Southeast Asian Art (SA, AP, HU)
 HART 2175. Modern and Contemporary Indian Architecture (AP, HU)
 HART 3112. The Arts of China during the Liao-Song Period (CC, HU)
 HART 3140. Healing and Art in East Asia. (AP, HU)
 HART 3164W. Art of Buddhist Relic and Reliquary (AP, HU)
 HART 3172. Himalayan Art: Art of the Divine Abode (AP, HU)
 HART 3174. The South Asian Temple (SA, HU)

Human and Organizational Development — International Leadership and Policy

HODI 3260. Education in the Asia-Pacific Region: Development, Reform, and Innovation (AP, SS)

Medicine, Health, and Society

MHS 2310. Chinese Society and Medicine (CC, SS)

Political Science

PSCI 2216. The Chinese Political System (CC, SS)
PSCI 3894. Selected Topics in Comparative Politics (as appropriate)*

Religious Studies

RLST 1500. Introduction to Islam (AP, HU)
RLST 1637. Religions of Tibet and the Himalaya (AP, HU)
RLST 1700. Religions in China (CC, HU)
RLST 1710. Religions of Japan (JC, HU)
RLST 2644. Buddhist Traditions (AP, HU)
RLST 2664. Foundations of Hindu Traditions (AP, HU)
RLST 3561. Islam in South Asia (SA, HU)
RLST 3650. Classical Philosophies of India (SA, HU)
RLST 3669. Sacred Space in the Tibetan World (AP, HU)
RLST 3670W. Buddhism and the State (AP, HU)
RLST 3747. Daoist Tradition (AP, HU)
RLST 3749. Zen Buddhism (AP, HU)
RLST 3753. East Asian Buddhism (AP, HU)
RLST 3775. Chinese Religions through Stories (CC, HU)
RLST 4665. Mythologies and Epics of South Asia (SA, HU)
RLST 4666. Devotional Traditions of South Asia: Hindu, Muslim, Sikh (SA, AP, HU)
RLST 4774. Japanese Mythology (JC, HU)

Asian Studies

Course descriptions begin on page 156.

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Biochemistry and Chemical Biology

CO-DIRECTORS Brian O. Bachmann, Michelle Sulikowski

Advisory Committee

PROFESSORS Brandt Eichman (Biological Sciences), Lawrence J. Marnett (Chemistry), John McLean (Chemistry), David W. Wright (Chemistry), John York (Biochemistry)

ASSOCIATE PROFESSOR Bruce M. Damon (Radiology and Radiological Sciences)

ASSISTANT PROFESSOR Lauren Parker Jackson (Biological Sciences)
SENIOR LECTURER Cynthia T. Brame (Biological Sciences)

THE study of chemical processes within living systems is an interdisciplinary enterprise that spans the fields of chemistry, molecular and cellular biology, biophysics, and engineering. Chemical biology and biochemistry use chemical insight, techniques, and tools to study or manipulate biological systems. They are the cornerstones of medical technology and therapeutics. To provide students with training in modern principles at a chemistry-biology interface, Vanderbilt's interdisciplinary major in biochemistry and chemical biology incorporates expertise from multiple departments in the university. Students receive a broad background in the natural sciences (chemistry, biology, physics) and mathematics, followed by fundamental

core training in principles of biochemistry and chemical biology that involves both theoretical and laboratory course work. Students then pursue an area of emphasis in either biochemistry or chemical biology through upper-level elective courses. Students participate in independent research in laboratories of biochemistry and chemical biology faculty. Additional research experience is available in the Honors Program.

Program of Concentration

The biochemistry and chemical biology major tracks share fundamental core elements but have a distinct set of foundational courses, track-specific electives, and laboratory requirements. All students are required to complete a set of basic science and mathematics courses. The major consists of 32 credit hours beyond these basic science and mathematics courses. All students complete 12 credit hours of core courses, 14 credit hours of either biochemistry or chemical biology track, and 6 credit hours of general electives. For suggested paths of completion, see the Program in Biochemistry and Chemical Biology website.

Required Math and Science Courses for Both Tracks

(38 credit hours)

Biological Sciences — BSCI 1510, 1511, 1510L, and either 1511L or 1512L

Chemistry — CHEM 2221 or 2211, CHEM 2222 or 2212, CHEM 2221L and CHEM 2222L

Mathematics — MATH 1200 or 1300 and MATH 1201 or 1301

Physics — PHYS 1501 or 1601, PHYS 1502 or 1602, PHYS 1501L or 1601L, and PHYS 1502L or 1602L

Note: These credit hours do not count toward the major. AP credit may satisfy some of these requirements.

Fundamental Core Courses for all Tracks (12 credit hours)

BCB 4965, BSCI 2520, CHEM 3710, CHEM 3310

Tracks (14 credit hours)**Biochemistry Track**

Biochemistry Foundations (3 credit hours) — BSCI 4265

Biochemistry Electives (9 credit hours) — BCB 2101, BCB 4320, BSCI 2201, BSCI 2210, CHEM 2100, CHEM 4720

Laboratory (2 credit hours) — BCB 3201

Chemical Biology Track

Chemical Biology Foundations (5 credit hours) — CHEM 2100 and 2100L, BCB 2101

Chemical Biology Electives (6 credit hours) — BCB 4320, BSCI 4265, CHEM 4720

Chemical Biology Laboratory (3 credit hours) — BCB 3201, BCB 4966

General Electives (6 credit hours)

Electives may be chosen from any of the following:

BCB 2101, BCB 3101, 3201, 4320; BME 2200, 3000, 4400, 4500; BSCI 2201, 2210, 3230, 3234, 3252, 3256, 3270, 4265, 4266; CHEM 2100, 3020, 3300, 3310, 3715, 4230, 4720, 4966; CS 1101, 1103, 2204; NSC 2201, 3245, 3260, 3269, 3274, 3891, 4961

Courses taken to fulfill track requirements are not eligible for elective credit.

Honors Program

Students in either Biochemistry or Chemical Biology track may apply to the Honors Program if they hold a minimum cumulative GPA of 3.3 and a GPA of at least 3.4 in courses that count toward the major at the end of their junior year. The purpose of the Honors Program is to provide students with an intensive independent research experience in a host laboratory. Honors candidates must complete two semesters (3 credit hours each semester) of Honors Research (BCB 4999). The successful completion of one semester of BCB 4999 may substitute for the BCB 4965 course requirement. Upon entering the program at the end of the junior year, candidates assemble a committee of the major research adviser and two additional faculty members appropriate to the area of research. As part of the research course work, the candidate will write an honors thesis. At the end of the graduating semester, honors candidates must submit a written thesis and give an oral defense of their research.

Course descriptions begin on page 158 for Biological Sciences, page 158 for Biochemistry and Chemical Biology, and page 161 for Chemistry.

Biological Sciences

CHAIR Brandt F. Eichman

VICE CHAIR Katherine L. Friedman

DIRECTOR OF UNDERGRADUATE STUDIES Mark A. Woelfle

DIRECTOR OF GRADUATE STUDIES Julian F. Hillyer

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Wallace M. LeSturgeon, Terry L. Page, Charles K. Singleton, Gerald J.

Stubbs, Dean P. Whittier, Robley C. Williams Jr.

PROFESSORS Seth R. Bordenstein, Kendal S. Broadie, Kenneth

C. Catania, Brandt F. Eichman, Todd R. Graham, Carl H. Johnson,

Douglas G. McMahon, James G. Patton, Antonis Rokas, Laurence J.

Zwiebel

ASSOCIATE PROFESSORS D. Kilpatrick Abbot, John Anthony Capra,

Larisa DeSantis, Katherine L. Friedman, Daniel J. Funk, Julian F. Hillyer

ASSISTANT PROFESSORS Nicole Creanza, Lauren Parker Jackson,

Jared T. Nordman, Maulik R. Patel, Lars Plate, Ann Tate

PRINCIPAL SENIOR LECTURERS A. Denise Due-Goodwin, Mark A.

Woelfle

SENIOR LECTURERS Amanda R. Benson, Cynthia T. Brame, Jessica

Gilpin, Allison Leich Hilbun, James D. Pask

LECTURER Thomas Clements

THE biological sciences encompass the study of living organisms and life processes at all levels: ecosystems, populations, individual organisms, tissues, cells, subcellular structures, and molecules. The Department of Biological Sciences offers courses that address all of these levels and programs of study for undergraduates and for graduate students seeking the Ph.D.

For undergraduates, the department offers three majors and a minor. All three majors have honors tracks. The Biological Sciences (BioSci) major is designed for the student seeking a broad base in the biological sciences, though it is a highly flexible program that allows a certain amount of specialization in upper-level courses. The Molecular and Cellular Biology (MCB) major is designed for students with an interest in developing an in-depth understanding of how living systems function at the molecular and cellular levels, with upper-level course options ranging in content from biophysics and biochemistry to developmental biology, and to molecular aspects of evolution.

The Ecology, Evolution, and Organismal Biology (EEOB) major is designed for students with an interest in the areas of biology that span genomics, ecology, evolutionary biology, comparative genomics, organismal biology, and conservation biology. The department also offers a minor in biological sciences for students majoring in other disciplines. Interested students should consult the director of undergraduate studies.

The department offers undergraduates opportunities for engaging in faculty-led research projects for course credit. Students may receive an introduction to the workings of a scientific laboratory through an internship, or a more intensive, hands-on experience in directed or independent laboratory research. Students on the honors track of any of the three majors carry out a major honors research project and write an honors thesis. More information about the majors and minor offered by the department, the honors track of each major, and research opportunities open to undergraduates is available at our website: as.vanderbilt.edu/biosci.

Students may declare only one of the majors offered by the Department of Biological Sciences; double or triple majors within the department are not permitted. It is strongly recommended that all students take one year of calculus or calculus/statistics, and one year of physics. Students are encouraged to work with their major advisers to choose upper-level courses appropriate to their chosen majors.

General Requirements

- All students in programs of concentration offered by the Department of Biological Sciences must take two semesters of general chemistry and lab (Chemistry 1601–1602 and 1601L–1602L) and two semesters of organic chemistry (Chemistry 2211/2221–2212/2222) and lab (2221L–2222L).
- A total of 30 credit hours of Biological Sciences courses, including the 8 credit hours of 1510–1511 and 1510L and either 1511L or 1512L, is required in all majors.
- All Biological Sciences courses count toward the major except 1100, 1105, and 1111. Below is a listing of the required courses for the Biological Sciences (BioSci) major, for the Molecular and Cellular Biology (MCB) major, and for the Ecology, Evolution, and Organismal Biology (EEOB) major. Students with specialized interests within either of the specialized majors may substitute one of the intermediate courses with an upper-level course with the permission of the director of undergraduate studies and the Biological Sciences Curriculum Committee. (Intermediate Biological Sciences courses: 2201, 2201L, 2205, 2210, 2210L, 2218, 2219, 2238, 2238L, 2520).
- All majors must complete at least 2 credit hours of 3965, 3850, or 3861, though only one semester of 3965 may count toward the 30 credit hours.
- A total of no more than 7 credit hours of 3850, 3861, or 3961 may count toward the major.
- If option 1 (see below) is used to meet the laboratory requirement, then BSCI 3965 or 2 credit hours of 3850 is required.

For Honors, additional requirements must be met. For entry into Honors, students must satisfy the conditions required by the College of Arts and Science for admission to departmental honors programs. Students must have an overall grade point average equal to or greater than 3.3, and a grade point average

in courses required for the appropriate biological sciences major equal to or greater than 3.4 at the time of entry. Applications must be approved by a majority vote of the faculty of the department. To receive honors or highest honors in biological sciences, a student in the departmental Honors Program must:

- 1) Complete the requirements for either the MCB, BioSci, or EEOB major, achieving a minimum cumulative grade point average of 3.4 in all courses that count toward the major;
- 2) Satisfactorily pursue a research project under the supervision of the adviser with a minimum of 10 credit hours of Honors Research, BSCI 4999;
- 3) Give a progress report to the Honors Committee at the end of the first semester of research. This will consist of a short written progress report to be distributed to the Honors Committee one week before an oral presentation and meeting with the committee. The meeting must be scheduled before the start of finals week;
- 4) At the end of the second semester of Honors Research,

prepare a thesis based on the research project, to be read and evaluated by the Honors Committee;

- 5) Present the thesis orally before the Honors Committee and faculty in the Department of Biological Sciences.

Minor in Biological Sciences

A minor in biological sciences requires a minimum of 18 hours including at least 9 credit hours earned in residence at Vanderbilt. Credit hours for the minor must include BSCI 1510–1511b; 1510L and either 1511L or 1512L; 2210; and one other intermediate course. No more than 2 credit hours of 3860, 3861, 3850, and 3961 may be counted toward the minor.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Specific Requirements for Individual Majors

BIOLOGICAL SCIENCES (BSCI) MAJOR			
Intermediate Courses	BSCI 2205, 2210, and one additional intermediate course (2201, 2218, 2219, 2238 or 2520)		
Laboratory	Option 1: Lab	Option 2: Lab and Research	Option 3: Research Intensive
	2 labs (BSCI 2201L, 2210L, 2218, 2219, or 2238L). See note above regarding BSCI 3965 or 3850.	1 lab plus 2 semesters (at least 6 credit hours total) of directed & independent research (BSCI 3861, 3961, 4999)	At least 12 credit hours of research in directed, independent and as needed, honors research courses (BSCI 3861, 3961, 4999)

ECOLOGY, EVOLUTION, AND ORGANISMAL BIOLOGY (EEOB) MAJOR			
Intermediate Courses	BSCI 2205, 2210, and one of 2218 or 2219 or 2238		
Laboratory	Option 1: Lab	Option 2: Lab and Research	Option 3: Research Intensive
	2 labs (one of BSCI 2210L, 2218, 2219, or 2238L; plus one of the following: BSCI 2201L, 2210L, 2218, 2219, or 2238L). See note above regarding BSCI 3965 or 3850.	1 lab (BSCI 2210L, 2218, 2219, or 2238L) plus 2 semesters (at least 6 credit hours total) of directed and independent research (BSCI 3861, 3961, 4999)	At least 12 credit hours of research in directed, independent and, as needed, honors research courses (BSCI 3861, 3961, 4999)

MOLECULAR AND CELLULAR BIOLOGY (MCB) MAJOR			
Intermediate Courses	BSCI 2201, 2210, and 2520		
Laboratory	Option 1: Lab	Option 2: Lab and Research	Option 3: Research Intensive
	2 labs (one of BSCI 2201L or 2210L is required; plus one of the following: 2201L, 2210L, 2218, 2219, or 2238L). See note above regarding BSCI 3965 or 3850.	1 lab (BSCI 2201L or 2210L) plus 2 semesters (at least 6 credit hours total) of directed and independent research (BSCI 3861, 3961, 4999)	At least 12 credit hours of research in directed, independent and, as needed, honors research courses (BSCI 3861, 3961, 4999)

Course descriptions begin on page 158.

Chemistry

CHAIR John McLean

DIRECTOR OF UNDERGRADUATE STUDIES Adam K. List

DIRECTOR OF GRADUATE STUDIES Carmelo J. Rizzo

PROFESSORS EMERITI Robert V. Dilts, Larry C. Hall, Thomas M. Harris,

David M. Hercules, Melvin D. Joesten, Charles M. Lukehart,

Ned A. Porter, Joel Tellinghuisen, David L. Tuleen

PROFESSORS Brian O. Bachmann, Darryl J. Bornhop, Richard M.

Caprioli, Walter J. Chazin, David E. Cliffe, Stephen W. Fesik,

Timothy P. Hanusa, Frederick R. Haselton, B. Andes Hess Jr.,

Jeffrey N. Johnston, Craig W. Lindsley, Terry P. Lybrand, H. Charles

Manning, Lawrence J. Marnett, Clare McCabe, Hassane S.

Mchaourab, John A. McLean, Jens Meiler, Prasad L. Polavarapu,

Carmelo J. Rizzo, Sandra J. Rosenthal, Kevin Schey, Michael P. Stone,

Gary A. Sulikowski, C. David Weaver, David W. Wright

ADJOINT PROFESSORS Cody Covington, Norma Dunlap, Rongson

Pongdee, Lidia Smentek

ASSOCIATE PROFESSORS Andrew Link, Renā Robinson

ADJOINT ASSOCIATE PROFESSOR Natalie Arnett,

ASSISTANT PROFESSORS Lauren E. Buchanan, Janet E. Macdonald,

Lars Plate, Nathan D. Schley, Steven D. Townsend

ADJOINT ASSISTANT PROFESSORS Amy-Joan Ham, Glenroy Dean

Martin

PRINCIPAL SENIOR LECTURERS Adam K. List, Shawn T. Phillips,

Michelle M. Sulikowski

SENIOR LECTURERS Hemant Badgandi, Alissa Hare, Craig G. Tainter,

Tara D. Todd, Susan Verberne-Sutton

LECTURERS Katherine Clements, Aaron Daniel

THE Department of Chemistry seeks to provide a sound education in the fundamentals of modern chemistry as well as exposure to cutting-edge research and contemporary instrumentation in the field. This is accomplished by providing students with a solid background in the disciplines of organic, analytical, inorganic, biological, and physical chemistry. The core courses in these areas, which are supported by a variety of practical experimental experiences in the laboratory, provide students with the skills needed to think critically about chemistry. After these core courses, students delve deeper into an area of their choice. Recognizing the importance of research, which integrates and makes sense of our collective body of knowledge, we encourage students to participate in undergraduate research. The chemistry major at Vanderbilt University meets the guidelines for the American Chemical Society approved program of study in chemistry.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Chemistry

The chemistry program is organized into four parts. The first part is a general chemistry course sequence (CHEM 1601–1602 and 1601L–1602L or AP credit) to serve as an entry point into the major. The second part consists of foundation courses in the five major disciplines of chemistry: analytical (2100), biochemistry (BSCI 2520), inorganic (3010), organic (2221–2222 or 2211–2212), and physical (3300 or 3310). The third part of the chemistry major consists of completing 8 credit hours of laboratory past 1601L–1602L. Four credit hours are from laboratory courses (2221L–2222L, 2100L, and 3315) associated with foundation courses. There are also 6 credit hours of a capstone laboratory (4965–4966) designed to provide advanced

laboratory experience. The fourth part of the major consists of completing a minimum of 6 credit hours of in-depth chemistry courses. These in-depth courses build upon the content of foundation courses or integrate concepts from these foundational disciplines.

Concentration in Chemistry

Required Non-chemistry Courses

One year of calculus (MATH 1300–1301 is preferred)

PHYS: Both 1501–1502 and 1501L–1502L,

or both 1601–1602 and 1601L–1602L,

or 1901–1902

Required Chemistry Courses

Cr. Hrs. toward major

Chem 1601–1602 & 1601L–1602L or AP credit 0

Chem 2221–2222 (or 2211–2212) & 2221L–2222L 8

Chem 2100 & 2100L 4

Chem 3300 or 3310 3

Chem 3315 1

BSCI 2520 3

Chem 3010 3

*Two in-depth chemistry courses 6

Chem 4965–4966 6

Minimum Credit Hours for Chemistry Major 34

* In-depth chemistry courses include all 2000-level chemistry and higher courses not explicitly required, except for CHEM 3600 and 3980–4980–4999. Other in-depth chemistry courses are Chemical and Biomolecular Engineering 3200 and 3250, and Earth and Environmental Sciences 4600, and any 5000-level chemistry lecture courses. (Qualified seniors interested in graduate-level courses must obtain approval from the course instructor, their adviser, and the director of graduate studies in chemistry. Further details are found in the Academic Policies for the College of Arts and Science.) A maximum of 3 credit hours of chemistry research (3860) may be counted as in-depth chemistry course hours.

Additional math courses, such as Math 2300 and Math 2820, are highly recommended for the chemistry major.

Options for Concentration in Chemistry

In-depth chemistry courses can be chosen so as to define a focus area within chemistry. Students should consult with their major adviser about focus area options, or to formulate an individualized focus area option. Further descriptions of these options and other recommended courses can be found in the chemistry major handbook on the chemistry department homepage.

Chemical Biology Focus. The role of chemical processes in biological systems is fundamental to chemical biology. The journal *Nature Chemical Biology* defines chemical biology as “the use of chemistry to advance a molecular understanding of biology and the harnessing of biology to advance chemistry.” Chemical biology builds upon the disciplines of medicinal chemistry, biochemistry, pharmacology, genetics, bioorganic and organic chemistry. Suggested in-depth chemistry electives: 3020, 3710, 3860, 4210, 4720.

Chemical Sciences Focus. This option provides a broad foundation of chemistry, permitting flexibility in future career pathways and providing an excellent preparation for positions in chemical industry and for graduate programs in chemistry. Suggested in-depth chemistry electives: 3120, 3300, 3310, 3860.

Environmental Chemistry Focus. Environmental chemistry concerns the chemical phenomena that occur in nature. Environmental chemistry spans atmospheric, aquatic, and soil chemistry with a reliance on analytical chemistry for methods of analysis. Environmental chemistry can be applied to the understanding of issues such as ground water pollution, wastewater treatment, ozone depletion, and greenhouse gas emissions. Suggested in-depth chemistry electives: 3120, 3300, 3310, 3860, EES 4600.

Materials Chemistry Focus. Materials chemistry is concerned with designing and synthesizing new materials with specific useful properties and determining the relationships between physical properties and the composition and structure of these new materials. Materials chemistry encompasses all size regimes from bulk to nanoscale. Synthetic chemistry (inorganic and organic), physical chemistry, and analytical chemistry are all important components of this field. Suggested in-depth chemistry electives: 3120, 3630, 2610, 3310, 2610, 3860, 5320, 5610, 5620.

Minor in Chemistry

The minor in chemistry requires 18 credit hours of course work, including 4 credit hours from 1602 and 1602L or AP credit, and 14 credit hours selected from any of the courses acceptable for the major in chemistry.

Honors in Chemistry

Students with an overall GPA of at least 3.3 and a GPA of at least 3.4 in chemistry courses at the start of their junior year wishing to do honors will register for the honors research courses (CHEM 3980, 4980, 4999) beginning spring semester junior year. The CHEM 4965 and 4966 requirements are waived in lieu of the CHEM 3980, 4980, and 4999 registrations. Honors candidates must present a thesis on the research done under CHEM 3980, 4980, and 4999 and pass an oral examination. Additional information may be found in the chapter on Special Programs in the College.

Licensure for Teaching

Candidates for teacher licensure in chemistry at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog. One semester of the CHEM 4965–4966 sequence will be considered fulfilled by completing the Peabody student teaching requirements.

Introductory Courses

Introductory chemistry is offered in two different sequences, each with its own laboratory. Only one set of these courses may be taken for credit.

1. Chemistry 1010, 1010L. Intended for liberal arts students who are not planning to take any additional chemistry courses. It treats chemistry in a nonmathematical fashion, with some historical and philosophical features. Not for science and engineering students.

2. Chemistry 1601–1602. Designed for engineering, science, and premedical students. This course, which must be taken simultaneously with 1601L–1602L, serves as preparation for students intending to major in chemistry, biology, physics, or earth and environmental sciences. It is a more rigorous, mathematical approach to chemistry and a prerequisite for organic and other

chemistry courses. It is not intended for liberal arts students taking a science course only to fulfill AXLE requirements.

Course descriptions begin on page 161.

Cinema and Media Arts

DIRECTOR Jennifer Fay
 ASSISTANT DIRECTOR Jonathan Waters
 PROFESSORS Jay Clayton, Jennifer Fay, Lutz Koepnick
 ASSOCIATE PROFESSORS Claire Sisco King, Andrea Mirabile, Jonathan Rattner
 ASSISTANT PROFESSORS Alejandro Acierto, Cesar Ignacio Ruiz Cortez, Haerin Shin
 SENIOR LECTURERS Madeleine Casad, Jonathan Waters
 WRITER IN RESIDENCE Krista Knight

Affiliated Faculty

PROFESSORS Joy Calico (Music), Colin Dayan (English), Gerald Figal (History), Sam B. Girgus (English), Yoshikuni Igarashi (History), Daniel Levin (Psychology, Peabody), Kelly Oliver (Philosophy), Lynn T. Ramey (French), T. Sharpley-Whiting (African American and Diaspora Studies and French), Benigno Trigo (Spanish), Mark A. Wollaeger (English)
 ASSOCIATE PROFESSORS Vanessa Beasley (Communication Studies), Phillip Franck (Theatre), Jay Geller (Divinity School), Stanley Link (Music), Peter Lorge (History), Letizia Modena (French and Italian), Emanuelle Oliveira (Portuguese), Vesna Pavlovic (Art)
 ASSISTANT PROFESSOR Anand Taneja (Religious Studies)
 SENIOR LECTURERS Alex Dubilet (English), Scott Juengel (English)

CINEMA and Media Arts offers an interdisciplinary major and minor that combine the practice of filmmaking with the study of film and media theory and history. Emphasizing cinema as both a modern aesthetic form and a hands-on cultural practice, the program trains students for careers in film and media production, communications, academic media studies, and community and social relations. While the program encourages new ways of thinking, looking, and making, it also develops the traditional learning skills of a liberal education. A core curriculum is comprised of film and media theory, history, and filmmaking. The major concludes with a senior seminar.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Cinema and Media Arts

The CMA major consists of 30 credit hours. The requirements are as follows:

CORE REQUIREMENTS

- 1500 (Fundamentals of Film and Video Production).
- 1600 (Introduction to Film and Media Studies).
- 2250 (16mm Filmmaking).
- 2260 (Digital Production Workshop).
- 2300 (Film and Media Theory).
- 2400 (History of World Cinema).

7. 3891 (Special Topics in Film and Video Production).
8. 3892 (Special Topics in the Study of Film).
9. Senior Seminar—4961 or 4962.
10. One elective: 2600W (Advanced Screenwriting); 3891 (Special Topics in Film and Video Production); 3892 (Special Topics in the Study of Film); 3893 (Special Topics in National Cinemas and Movements). 3891 and 3892 may be repeated for elective credit provided there is no duplication in topic.

Honors Program

The Honors Program in Cinema and Media Arts offers excellent students the opportunity to undertake a high-level independent research and/or creative project during their senior year. Projects must be rigorous and demonstrate a student's ability to sustain an argument, an aesthetic principle, or a narrative arc in a substantial form. For admission to the Honors Program, students must have and maintain until graduation a cumulative grade point average of 3.3 and a grade point average of 3.5 in courses counting toward the major. The student must submit an application to the program director outlining the thesis topic. In addition to completing the major requirements listed above, during the senior year the student is required to register for Cinema and Media Arts 4998 (3 credit hours) and 4999 (3 credit hours) in order to complete the thesis. An oral examination on the thesis and its area is to be completed during the final semester of undergraduate study.

Minor in Cinema and Media Arts

The minor consists of 15 credit hours. The requirements are as follows:

1. 1500 (Fundamentals of Film and Video Production).
2. 1600 (Introduction to Film and Media Studies).
3. One course in intermediate filmmaking: 2250 (16mm Filmmaking); 2260 (Digital Production Workshop).
4. One course in intermediate cinema studies: 2300 (Film and Media Theory); 2400 (History of World Cinema).
5. One elective: 2600W (Advanced Screenwriting); 3891 (Special Topics in Film and Video Production); 3892 (Special Topics in the Study of Film); 3893 (Special Topics in National Cinemas and Movements).

Course descriptions begin on page 164.

Classical and Mediterranean Studies

INTERIM DIRECTOR William Caferro
 DIRECTOR OF UNDERGRADUATE STUDIES Daniel P. Solomon
 PROFESSORS EMERITI Robert Drews, F. Carter Phillips, Jack. M. Sasson,
 Susan Ford Wiltshire
 PROFESSORS William Caferro, David Wasserstein
 ASSOCIATE PROFESSORS Phillip I. Ackerman-Lieberman Kathy L. Gaca,
 David Michelson, Joseph L. Rife, Betsey Robinson
 ASSISTANT PROFESSORS Scott Aikin, Ari Bryen, Monica Park
 PRINCIPAL SENIOR LECTURER Daniel P. Solomon

SENIOR LECTURERS Jason Harris, Chiara Sulprizio
 SENIOR LECTURER, RETIRED George Gaffney

Affiliated Faculty
 PROFESSOR Thomas A. McGinn (History),
 ASSISTANT PROFESSORS Elsa Filosa (French and Italian), Mireille M.
 Lee (History of Art)

The Program in Classical and Mediterranean Studies offers students an interdisciplinary perspective on the culture and history of a region at the crossroads of human civilization since antiquity. The study of the Mediterranean world examines the influential achievements and legacy of the Greeks and Romans alongside the emergence and spread of Judaism, Christianity, and Islam to the East. It also explores the pre-modern to modern development of southern Europe, North Africa, and western Asia, which have variously responded to the ancient and medieval past. The program offers courses in the history, religion, philosophy, art, literature, society, and culture of the Mediterranean world. In teaching and research, the faculty promote the integrated study of past and present through both written and material sources—textual, artifactual, visual, spatial—and they embrace analytical techniques in the digital humanities. Students thus have the opportunity to learn several ancient and medieval languages of Europe and the Middle East and to pursue experiential learning overseas, from intensive modern language study to archaeological fieldwork to the investigation of evolving cultural and natural landscapes.

Majors in classical and Mediterranean studies are introduced to the distinctive geography and history of the region but choose their courses in one of three tracks. These tracks have shared content but offer different viewpoints and training. Majors who expect to apply for graduate study should work closely with an adviser to devise an appropriate curriculum.

Students who pursue Classical and Near Eastern Languages and Cultures investigate one or more ancient to medieval cultural tradition(s) in the Greco-Roman and Near Eastern spheres through the study of original texts and their historical setting, such as Greek tragedy, Latin oratory, Hebrew scripture, the Qur'an, or early French romance.

Students who pursue Mediterranean Archaeology explore human diversity and experience from Classical Antiquity to the Middle Ages through the study of material and visual culture. They too learn to read textual sources while acquiring the skills of archaeological and art-historical research.

Students who pursue Mediterranean Studies, the most flexible track for a broad range of interests, can choose to engage with a variety of ancient, medieval, or modern topics through focused or comparative study.

The Program in Classical and Mediterranean Studies also offers a minor in Mediterranean archaeology and a minor in Mediterranean studies. A student cannot earn more than one minor in the program.

The Honors Program requires the production of a thesis representing advanced, original, and substantial research.

Students are strongly recommended to pursue study abroad in the Mediterranean or an adjacent region. The program has long supported the Intercollegiate Center for Classical Studies, the American Academy in Rome, and the American School of Classical Studies in Athens. Many different international experiences are possible through Vanderbilt-approved semester programs, Maymesters, research projects, and summer study, for example, in Italy, Greece, and Israel. The program encourages students to participate in local and regional conferences, where they can share the results of collaborative or independent

work. Students concentrating on Greek and/or Latin language who qualify academically are invited to join Eta Sigma Phi, the national classics honor society.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Classical and Mediterranean Studies

Students majoring in classical and Mediterranean studies must take ten courses, including one foundation course (CLAS 1010). The major is arranged into four tracks. Students must formally declare track 1–3 at the time the major is declared. A score of 4 or 5 on the AP Latin exam earns 3 hours of credit for Latin 2202, which may be applied toward any of the major tracks. Any course for which a student has earned credit will count for one and only one of the requirements or sub-requirements for any of the major tracks or minors.

Track 1: Classical and Near Eastern Languages and Cultures

30–34 total credit hours including:

1. One foundation course: CLAS 1010 (3 credit hours);
2. Language/Literature: Five courses from Course List A (15 credit hours, or 19 credit hours if including ARA 1101–1102);
3. Culture: Four courses from Course Lists B–D numbered 2060 or above (12 credit hours).

Latin courses at the 1000 level do not count toward this major track. Students who fulfill their language/literature requirement (#2 above) by completing courses in one language must, in consultation with the director of undergraduate studies, earn credit for at least one course in a different cultural tradition (e.g., Greek, Roman, Jewish, Christian, Islamic) or period (e.g., ancient, medieval).

Track 2: Mediterranean Archaeology

30–34 total credit hours including:

1. Two foundation courses: CLAS 1010 and 1020 (6 credit hours);
2. Language/Literature: Two courses from Course List A (6 credit hours, or 10 if including ARA 1101–1102);
3. Method and Theory: One course from Course List E (3 credit hours);
4. Three courses in the history and in the art, architecture, and archaeology of the ancient to medieval Mediterranean world, including one from Course List B, one from Course List C, and one from Course List B or C (9 credit hours);
5. Electives: Two courses from Course Lists A–E or from the following (6 credit hours):

ANTHROPOLOGY: 1101, Introduction to Anthropology; 1201, Introduction to Archaeology; 1301, Introduction to Biological Anthropology; 1601, Introduction to Language and Culture; 2211, Archaeology; 2220, Human Landscapes; 2227, Food in the Ancient World; 2370, Death and the Body; 3160, Anthropologies and Archaeologies of Community; 3161, Colonial Encounter in the Americas; 3200, Ancient Cities; 3202, The Collapse of Civilizations.

With the permission of the director of undergraduate studies, students may fulfill the method and theory requirement (#3 above) by completing a program of practical archaeology (e.g., CLAS 3710, 3720, ANTH 3866, participation in an excavation or field survey, an internship in conservation or curation). No more than 15 credit hours of courses numbered below 2050 may count toward this major track.

Track 3: Mediterranean Studies

30 total credit hours including:

1. One foundation course: CLAS 1010 (3 credit hours)
2. Historical basis: Four courses from Course Lists A–D (12 credit hours);
3. Comparative perspectives: Five courses from Course Lists A–F (15 credit hours).

Students may apply up to three semesters of one Mediterranean language toward the historical basis requirement of this major track, including either an ancient to medieval language in Course List A or Catalan, French, Italian, Portuguese, or Spanish. French, Italian, Latin, and Spanish courses at the 1000 level do not count toward the major. No more than 12 credit hours of courses numbered below 2050 may count toward this major track.

Honors Program

The Honors Program in Classical and Mediterranean Studies offers students a more intensive concentration in their main field.

Candidates should signal their interest to the director of undergraduate studies by the beginning of the second semester of the junior year.

Admission requirements are:

1. A cumulative GPA of 3.3, and a GPA of 3.5 in courses that count toward the major.
2. Approval by the faculty of a 2–3 page thesis proposal, due by the middle of the second semester of the junior year.

In addition to maintaining the stated GPA throughout the senior year, Honors students must complete CLAS 4998 and 4999 for 3 credit hours each in addition to the 30–34 credit hours required by the major, culminating in a written thesis that is defended orally. A committee of three faculty members (two of whom must hold sole or joint appointments in the Program in Classical and Mediterranean Studies) will evaluate the thesis and the oral defense.

Minor in Mediterranean Archaeology

Students are required to complete CLAS 1010, 1020, and 12 additional credit hours in courses that count toward Track 2 of the concentration, of which at least 9 credit hours must be from courses numbered 2060 or above.

Minor in Mediterranean Studies

Students are required to complete CLAS 1010 and 15 additional credit hours in courses that count toward Track 3 of the concentration, of which at least 9 credit hours must be from courses numbered 2060 or above.

Approved List of Courses

A. Ancient to Medieval Mediterranean Languages and Literatures

CLASSICAL HEBREW: 1101, Beginning Classical Hebrew I; 1102, Beginning Classical Hebrew II; 2200, Intermediate Classical Hebrew; 3010, Historical Hebrew Grammar; 3020, Classical Hebrew Poetry; 3030, West Semitic Inscriptions.

GREEK: 1101, Beginning Greek I; 1102, Beginning Greek II; 2201, Intermediate Greek I: Classical and Koiné Greek; 2202, Intermediate Greek II: Homer's *Iliad*; 3010, The Greek Orators; 3020, The Greek Historians; 3040, Readings in Plato and Aristotle; 3100, The Greek Tragedians; 3110, Greek Lyric Poetry; 3200, Early Christian Writers; 3850, Independent Study; 3890, Special Topics in Greek Literature.

LATIN: 1101, Beginning Latin I; 1102, Beginning Latin II; 1103, Intensive Elementary Latin; 2201, Intermediate Latin I; 2202, Intermediate Latin II; 3010, The Writings of Caesar; 3020, Cicero and the Humanistic Tradition; 3030, Latin Letters; 3040, The Roman Historians; 3050, Suetonius; 3060, Tacitus; 3100, Roman Comedy; 3110, Catullus; 3120, Lucretius: *De Rerum Natura*; 3130, Vergil: *The Aeneid*; 3140, The Lyric Poetry of Horace; 3150, Latin Elegy; 3160, Ovid; 3170, Roman Satire; 3180, Neronian Writers; 3200, Early Christian Writers; 3850, Independent Study; 3890, Special Topics in Latin Literature.

ARABIC: ARA 1101, Elementary Arabic I; 1102, Elementary Arabic II; 2201, Intermediate Arabic I; 3301, Arabic of the Qur'an and Other Classical Texts; RLST 4593, Advanced Readings in Islamic Tradition.

UGARITIC: CHEB 2300, Ugaritic.

ARAMAIC AND CLASSICAL SYRIAC: ARAM 2400, Introduction to Classical Syriac; 2500, Egyptian Aramaic; CHEB 3030, West Semitic Inscriptions.

AKKADIAN: CLAS 3300, Elementary Akkadian I; 3301, Elementary Akkadian II.

OLD FRENCH: FREN 3224, Medieval French Literature.

MEDIEVAL TO RENAISSANCE ITALIAN: ITAL 3100, Literature from the Middle Ages to the Renaissance; 3240, Dante's *Divine Comedy*; 3242, Dante in Historical Context; 3340, *Famous Women* by Boccaccio.

OLD SPANISH: SPAN 4400, Origins of Spanish Literature.

B. Ancient to Medieval Mediterranean History

CLASSICAL AND MEDITERRANEAN STUDIES: 2100, History of the Ancient Near East; 2110, History of Greece to Alexander the Great; 2120, Greece and the Near East from Alexander to Constantine; 2150, History of the Roman Republic; 2160, History of the Roman Empire; 2180, The Mediterranean World from Late Antiquity to the Middle Ages.

HISTORY: 1190, A History of Islam; 1350, Western Civilization to 1700; 1600, European Economic History 1000–1700; 2220, Medieval and Renaissance Italy, 1000–1700; 2230, Medieval Europe, 1000–1350.

C. Ancient to Medieval Mediterranean Art, Architecture, and Archaeology

CLASSICAL AND MEDITERRANEAN STUDIES: 2200, Archaic and Classical Greek Art and Architecture, 1000 to 400 B.C.E.; 2210, Late Classical Greek and Hellenistic Art and Architecture; 2250, Roman Art and Architecture; 3200, The Greek City; 3210, The Archaeology of Greek Sanctuaries; 3220, The Trojan War in History, Art, and Literature; 3230, Alexander the Great.

HISTORY OF ART: 2180, Islamic Art and Architecture; 2210, Art and Architecture of Ancient Egypt; 2220, Greek Art and Architecture; 2260, The Art of Pagans, Christians, and Jews; 2270, Early Christian and Byzantine Art; 2275, The Cross and the Crescent: Byzantine-Islamic Confluences in Art; 3224, Greek Sculpture; 3226, Greek Vases and Society; 3228, Gender and Sexuality in Greek Art; 3240, Ancient Landscapes; 3272, Portraits in Late Antiquity; 3274, Art and Empire from Constantine to Justinian.

D. Ancient to Medieval Mediterranean Studies

CLASSICAL AND MEDITERRANEAN STUDIES: 1111, First-Year Writing Seminar; 1120, Greek Civilization; 1130, The Greek Myths; 1150, Roman Civilization; 3000, Classical Tradition in America; 3030, Death, Disease, and Health in the Ancient World; 3100, Women, Sexuality, and Family in Ancient Greece and Rome; 3110, Warfare in the Ancient Mediterranean; 3120, Humor, Ancient to Modern; 3150, Roman Law; 3160, Roman Law and Society; 3190, Augustan Rome; 3310, Culture of the Ancient Near East; 3350, History of Ancient and Medieval Christianity; 3360, Early Christian Poetry; 3370, History of Syriac Christianity; 3380, Desert Spirituality in Early Christianity; 3600, Seminar in Digital Humanities; 3710, Maymester in Greece; 3720, Maymester in Rome; 3730, Maymester in Israel.

ENGLISH: 2318, World Literature, Classical.

HISTORY: 2150, Muhammad and Early Islam; 2160, Medicine in Islam; 2170, Islam and the Crusades; 2180, Islamic Narratives, Narratives of Islam; 2190, The Late Empire of Islam; 2237, Democracy and Dictatorship: Ancient Politics; 2238, Crime and Criminal Law in Western Antiquity; 2240, Sex Law; 3210, Muslims, Christians, and Jews in Medieval Spain.

HISTORY OF ART: 1100, History of Western Art I; 1101, History of Western Architecture I; 2285, Medieval Art; 2290, Gothic Paris; 2310, Italian Art to 1500; 2320, Italian Renaissance Workshop; 2325, Great Masters of the Italian Renaissance; 3252, Cities of the Roman East; 3320, Early Renaissance Florence; 3332, Raphael and the Renaissance; 3334, Michelangelo's Life and Works; 3790.

ITALIAN: 3803, Maymester in Sicily.

JEWISH STUDIES: 1200, Classical Judaism: Jews in Antiquity; 1220, Jews in the Medieval World; 2150, Issues in Rabbinic Literature; 3892, Topics in Ancient and Medieval Jewish History.

PHILOSOPHY: 2100, Ancient Philosophy; 2101, Hellenistic and Late Ancient Philosophy; 2102, Medieval Philosophy; 3005, Jewish Philosophy; 3006, Islamic Philosophy.

POLITICAL SCIENCE: 2202, Ancient Political Thought.

RELIGIOUS STUDIES: 1500, Introduction to Islam; 3350, Christian-Jewish Relations in Medieval and Early Modern Europe; 4551, Mysticism in Islam.

E. Archaeological and Art-Historical Method and Theory

ANTHROPOLOGY: 2603, Comparative Writing Systems; 3261, Geographic Information Systems and Remote Sensing; 3260, Ceramic Analysis in Archaeology; 3262, Ethics in Anthropology, Archaeology, and Development; 3344, Genetic Anthropology Lab Techniques; 3372, Human Osteology; 3866, Archaeological Excavation; 3901, Problems in Anthropological Theory; 4345, Human Evolutionary Genetics.

CLASSICAL AND MEDITERRANEAN STUDIES: 3600, Seminar in Digital Humanities.

EARTH AND ENVIRONMENTAL SCIENCES: 1030, Oceanography; 1510, The Dynamic Earth: Introduction to Geological Sciences; 2510, Earth Systems through Time.

HISTORY OF ART: 3810, Exhibiting Historical Art.

F. The Modern Mediterranean World

HISTORY: 1200, The Arab Spring; 3190, Religion, Culture, and Commerce: The World Perspective.

HISTORY OF ART: 2780, History of Western Urbanism; 2782, Storied Places: History of Landscape Design.

JEWISH STUDIES: 2600, Islam and the Jews.

RELIGIOUS STUDIES: 4552, Islam in the Modern World.

Course descriptions begin on page 165.

Communication of Science and Technology

DIRECTOR David A. Weintraub (Physics and Astronomy)

PROFESSORS Michael Bess (History), Jay Clayton (English), Jennifer M. Fay (Cinema and Media Arts, English), David Hess, M. Shane Hutson (Physics and Astronomy), Sarah Igo (History), Lutz Koepnick (German, Cinema and Media Arts), Jeffrey D. Schall (Psychology), Robert J. Scherrer (Physics and Astronomy), Mark Schoenfield (English), David W. Wright (Chemistry)

PROFESSOR OF THE PRACTICE Christopher Rowe (Engineering Management)

ASSOCIATE PROFESSORS Jeffrey A. Bennett (Communication Studies), Douglas H. Fisher (Computer Science and Computer Engineering), Suzana Herculano-Houzel (Psychology), Laura Stark (Medicine, Health, and Society), Paul H. Stob (Communication Studies)

ASSISTANT PROFESSOR Ole Molvig (History)

PRINCIPAL SENIOR LECTURER Daniel Morgan (Earth and Environmental Sciences)

SENIOR LECTURERS Kendra H. Oliver (Pharmacology), Stephen K. Ornes

LECTURER Shellie Richards

WRITER IN RESIDENCE Amanda Little

THE Program in Communication of Science and Technology (CSET) sits at the intersection of the sciences and the humanities, and it builds on the vast amount of effort at Vanderbilt devoted to interdisciplinary work that spans the natural sciences, engineering, the social sciences, and the humanities. CSET draws on both the scientific communities (natural sciences, social sciences, engineering, medicine) and the creative communities (public speaking, writing, digital media production) across multiple colleges at Vanderbilt.

CSET is designed for students who have an interest in science and technology and also are interested in communicating science and technology to both peer-professional audiences and to the larger world. CSET is ideal as a second major for students pursuing a first major in one of the natural sciences, any of several of the social sciences, engineering, the Science, Medicine and Technology concentration in History, and the Creative Writing track in English. In the twenty-first century scientists must be able to communicate their work and their ideas to their professional peers, to nonspecialists who review grant proposals, and to lay audiences who ultimately fund, support, and benefit from the discoveries made in laboratories around the world. In return, the scientific community needs support from professional writers, journalists, technical writing specialists, public speakers, film and video writers and producers, and bloggers in communicating modern science, technology, and medicine to lay audiences.

Program of Concentration in Communication of Science and Technology

At least 42 credit hours, as follows. See below for lists of courses that count for each requirement.

- One Introduction to the Communication of Science and Technology course (one 3 credit hour course).
- One public speaking course (one 3 credit hour course).
- One advanced non-science writing course (one 3 credit hour course).
- One advanced (2100 level or higher) CSET or science communication skills course(s) (3 credit hours).
- One course bridging science, engineering, or medicine and health with non-science content and issues (one 3 credit hour course).
- One statistics course (one 3 credit hour course).
- Five courses (15 credit hours; minimum 3 credit hours per course) from the natural sciences and/or engineering.
- Three electives (9 credit hours).

Additional notes:

- Students in the College of Arts and Science must count at least 24 credit hours for CSET that are not also used to fulfill any program requirements for any other major or minor in the College of Arts and Science.
- A course can only be used once to fulfill a single CSET requirement, even if it is eligible under more than one CSET requirement.
- A student may count no more than 3 total credit hours toward any and all requirements of the CSET major from courses in the following list: BME 4951, ChBE 4951W, CE 4950, CE 4951, ENGM 2210, and ES 2100W.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Approved Courses:

- 1) **Introductory Course:**
CSET 2100, Science Communication Tools and Techniques.
- 2) **Public Speaking:** One course from
CMST 1501, The Public Communication of Science; 2100, Argumentation and Debate; 2110, Persuasion; 2120, Business Communication.
- 3) **Advanced Non-Science Writing:** One course from
ANTH 2113W, Food, Identity, and Culture; 2160W, Creating Community; 2220W, Human Landscapes; 2242, The Archaeology of Ancient Maya Civilization; 3243W, Ancient Maya Gods and Rulers; 3622W, Classic Maya Language and Hieroglyphs.
CLAS 3030, Death, Disease, and Health in the Ancient World; 3190W, Augustan Rome.
CMA 2500W, Screenwriting; 2600W, Advanced Screenwriting.
CMST 3620/3620W, Rhetoric, Culture, and Critique; 3730/3730W, Communication, Culture, and Consciousness.
ENGL 3210, Intermediate Nonfiction Writing; 3215, The Art of Blogging: Learning to Think and Write in the Age of Online Publishing; 3220, Advanced Nonfiction Writing;

3230, Intermediate Fiction Workshop; 3240, Advanced Fiction Workshop; 3250, Intermediate Poetry Workshop; 3260, Advanced Poetry Workshop; 3726, New Media; 3728/3728W, Science Fiction; all other 2100 level or higher W ENGL classes not included in other CSET requirement listings.

HART 3140, Healing and the Art of East Asia; 3240W, Ancient Landscapes; 3725W, The Skyscraper: Modern Urban Icon; 3810W, Exhibiting Historical Art.

HIST 1385W, Disease and Disorder in the Atlantic World; 1430W, North American Indians and the Environment; 2413W, Global History of Waste; 3045W, Eugenics in the U.S., 1865–present; 3070W, Science, Technology, and Modernity.

MHS 3050W, Medicine and Literature; all other 2100 level or higher W MHS classes.

PHIL 3012W, Writing as Political Resistance; 3606W, Moral Problems; 3610W, Ethics and Law; 3618W, Philosophy and Literature.

RLST 2250W, History of the Bible; 3304W, Evangelical Protestantism and the Culture Wars; 3670W, Buddhism and the State.

THTR 2311W, Writing for the Stage and Screen.

- This requirement, in combination with both requirements #5 (Bridging) and #8 (Electives), is automatically fulfilled by students who have taken at least 15 credit hours of course work from the courses approved by the Department of History in Program G: Science, Medicine, and Technology.
- This requirement, in combination with requirement #8 (Electives), is automatically fulfilled by students who have completed at least 12 credit hours of the following:

2100 level or higher ENGL courses,

2100 level or higher “W” courses,

3004–3661 PHIL courses,

3000–4939 RLST courses.

4) **Advanced Science Writing or Science Communications Skills:** Three credit hours from

ANTH 3150W, Cognitive Anthropology.

BME 4951, Design of Biomedical Engineering Devices and Systems II.

CE 4950, Civil Engineering Design I, plus CE 4951, Civil Engineering Design II.

ChBE 4951W, Chemical Engineering Design Projects.

CHEM 3135W, Forensic Analytical Chemistry.

CSET 3090, Introduction to Science and Technology Policy; 3100, Science Policy Bootcamp: Concept to Conclusion; 3200W, Technical Writing; 3220, Fundamentals of Science Writing: How to Make Scientific Research and Discovery Matter; 3240, Science (Non-)Fiction: The Bestselling Books and Astounding Articles That Have Transformed Our Understanding of Science.

ENGL 3720/3720W, Literature, Science and Technology; 3730, Literature and the Environment; 3896, Special Topics in Investigative Writing in America.

ENGM 2210, Technology Strategy.

ES 2100W, Technical Communications.

ME 4951, Engineering Design Projects.

Any other 2100 level or higher “W” course also identified as an “MNS” course for purposes of AXLE.

5) **Bridging:** One course from

ANTH 2109, Food Politics in America; 2113W, Food, Identity, and Culture; 2160W, Creating Community; 2220W, Human Landscapes; 2242, The Archaeology of Ancient Maya Civilization; 3143, Medical Anthropology; 3343, Biology and Culture of Race; 3141, Anthropology of Healing; 3142, Medicine, Culture, and the Body; 3150W, Cognitive Anthropology; 3243W, Ancient Maya Gods and Rulers; 3345, Genetics in Society; 3622W, Classic Maya Language and Hieroglyphs; 4373, Health and Disease in Ancient Populations.

ASIA 2630, Chinese Medicine.

ASTR 2130, The Trial of Galileo and Its Background.

CLAS 3030, Death, Disease, and Health in the Ancient World; 3730: The Roman to Medieval Near East: Caesarea Excavations, Israel.

CMST 2800, Rhetoric and Civic Life; 3730/3730W, Communication, Culture, and Consciousness; 3740, Rhetoric of Medicine and Health; 3750, Rhetoric of the Body.

CS 1151, Computers and Ethics.

CSET 2410, The London Art-Science Scene: Visual Science Communication for the 21st Century.

ECON 2350, Health Care Policy.

ENGL 3720/3720W, Science Fiction; 3730, Literature and the Environment; 3896, Special Topics in Investigative Writing in America.

HART 2815, Digital Heritage: Methods and Practice.

HIST 1385W, Disease and Disorder in the Atlantic World; 1430W, North American Indians and the Environment; 1470, History of Exploration; 1480, The Darwinian Revolution; 1500, History of Modern Sciences and Society; 1510/1510L, The Scientific Revolution; 1520, Science and the Sea; 1780W, Self and Society in the United States; 2139, Technology, Nature, and Power in Africa; 2160, Medicine in Islam; 2413/2413W, Global History of Waste; 2780, Superhuman Civilization; 2800, Modern Medicine; 2810, Women, Health, and Sexuality; 2830, Medicine, Culture, and the Body; 3030, Epidemics in History; 3040, Health and the African American Experience; 3045W, U.S. Eugenics 1865–present; 3050, Innovation; 3070W, Science, Technology, and Modernity; 3230, The Art of Empire.

MATH 3000, History of Mathematics.

MHS: any 2100 level or higher course, with the exception of the following: 3000, Undergraduate Seminar; 3101, Human Anatomy and Physiology I; 3102, Human Anatomy and Physiology II; 3830, Service Learning; 3831, Service Learning Research and Readings; 3850, Independent Study; 3880, Internship Training; 3881, Internship Readings and Research; 3890, Special Topics; 4998, Honors Research, and 4999, Honors Thesis.

PHIL 3608, Ethics and Medicine; 3616, Philosophy and the Natural Sciences.

- PSCI 2255, Public Policy Problems; 2256, Politics of Public Policy; 3253, Ethics and Public Policy; 3266, Climate Change Justice; 3268, American Health Policy.
- PSY 3605, Industrial and Organizational Psychology; 3635, Health Psychology; 3705, Human Sexuality.
- PSY-PC 3210, Hospitalized Child.
- RLST 3921, Ethics and Ecology; 3941, Religion, Science, and Evolution.
- RUSS 2273, Russian Science Fiction.
- SCED 3320, Introduction to Literacies in Science.
- SOC 3301, Society and Medicine; 3311, Climate Change and Society; 3313, Sociology of Health and Environmental Science; 3315, Human Ecology and Society; 3317, Energy Transitions and Society.
- WGS 2240, Introduction to Women's Health; 2268, Gender, Race, Justice, and the Environment; 2270, Ecofeminism: Theory, Politics, and Action.
- This requirement, in combination with both requirements #3 (Advanced Non-Science Writing) and #8 (Electives), is automatically fulfilled by students who have taken at least 15 credit hours of course work from the courses approved by the Department of History in Program G: Science, Medicine, and Technology.
- 6) **Statistics:** One course from
- BME 3200, Analysis of Biomedical Data.
- BSCI 3270, Statistical Methods in Biology.
- CE 3300, Risk, Reliability, and Resilience Engineering.
- ChBE 3900W, Chemical Engineering Laboratory I.
- ECON 1500, Economic Statistics; 1510, Intensive Economic Statistics.
- MATH 1011, Probability and Statistical Inference; 2810, Probability and Statistics for Engineering; 2820, Introduction to Probability and Mathematical Statistics.
- PSY 2100, Quantitative Methods.
- PSY-PC 2110, Introduction to Statistical Analysis; 2120, Statistical Analysis.
- SOC 2100, Statistics for Social Scientists.
- 7) **Natural Sciences and Engineering:** Five courses (minimum 3 credit hours each)
- As used here, "Natural Science" includes all courses identified by the College of Arts and Science as MNS courses in AXLE, excluding MATH and PHIL courses.
 - At least three of these five courses must be Natural Science (MNS) courses numbered 2100 or higher.
 - The other two courses must be Natural Science (MNS) courses numbered 2100 or higher or courses taken at any level from the School of Engineering, except those identified below.
 - Students may count the three 1 credit hour courses ES 1401, 1402, and 1403 as equivalent to a single 3 credit hour course if they earn credit for all three courses.
 - The following School of Engineering courses are excluded from this requirement: all 1000 level CS courses; any courses that may count toward requirement #4, requirement #5, or requirement #6; all research, special topics, design seminar, directed study, independent study, and service learning courses.
- This requirement is automatically fulfilled by students who have taken
 - at least 15 credit hours of 2100 level or higher level MNS courses that are not also counting toward any other CSET requirement; or
 - at least 15 credit hours of 2100 level or higher level ANTH courses that are not also counting toward any other CSET requirement; or
 - at least 15 credit hours of 2100 level or higher level PSY courses that are not also counting toward any other CSET requirement; or
 - at least 15 credit hours of courses from the Environmental Sociology Core that are not also counting toward any other CSET requirement; or
 - at least 15 credit hours of 2100 level or higher course work in the School of Engineering that are not also counting toward any other CSET requirement.
- 8) **Electives:** At least three courses totaling at least 9 credit hours selected from any of requirements #2, #3, #4, #5, and #7 and/or from the Cinema and Media Arts courses listed below and/or from other digital media production courses involving video, audio, visual communication, or social media, and/or any of the below-listed CSET courses.
- Digital media production courses* may be selected from the following:
- CMA 1500, Fundamentals of Film and Video Production; 1600, Introduction to Film and Media Studies; 2250, 16mm Filmmaking; 2260, Digital Production Workshop; 2500W, Screenwriting; 2600W, Advanced Screenwriting.
- THTR 2311W, Writing for the Stage and Screen.
- Additional CSET courses* may be selected from the following:
- CSET 1001, Commons iSeminar; 3840, Directed Study; 3841, Project in Science Writing and Communicating; 3890, Special Topics; or 4998, Honors Thesis.
- This requirement, in combination with both requirements #3 (Advanced Non-Science Writing) and #5 (Bridging), is automatically fulfilled by students who have taken at least 15 credit hours of course work from the courses approved by the Department of History in Program G: Science, Medicine, and Technology.
 - This requirement, in combination with requirement #3 (Advanced Non-Science Writing), is automatically fulfilled by students who have completed at least 12 credit hours of the following:
 - 2100 level or higher ENGL courses,
 - 2100 level or higher "W" courses,
 - 3004–3661 PHIL courses,
 - 3000–4939 RLST courses.

Honors Program

Honors in CSET is a selective program of individual undergraduate work, supervised by a faculty adviser. Honors candidates propose, construct, and complete a project (written, visual, aural, digital, or a combination) that demonstrates the ability to communicate science, in depth, to a nonexpert audience.

Requirements for Admission to Honors in CSET

To be admitted to the Honors Program in CSET, a student must

- be a CSET major;
- have completed requirements #1, #2, either #3 or #4, and at least 21 credit hours of work that counts toward the CSET major;
- have a cumulative GPA of at least 3.30;
- have a GPA of at least 3.40 in all courses that count toward the CSET major.

Requirements for Completion of Honors in CSET

To earn Honors or Highest Honors in CSET, a student must

- complete the requirements of the CSET major;
- complete at least 6 credit hours of work in any combination of CSET 3840, 3841, and 4998, of which at least 3 credit hours must be in CSET 4998;
- present a written and oral defense of the CSET 4998 project before a faculty examination committee;
- have a cumulative GPA of at least 3.30;
- have a GPA of at least 3.40 in all courses that count toward the CSET major.

Course of Study for Honors in CSET

Interested students may apply in the fall or spring of their junior year or the fall of the senior year. The application includes a one- to two-page proposal of the planned Honors project and the signature of the faculty member who will be the project adviser.

Students in the Honors Program must earn at least 3 credit hours in CSET 4998 (Honors Thesis). Students may earn credit for CSET 4998 for up to four semesters.

An Honors candidate must pass an oral examination of the Honors project no later than the final week of classes in the student's final semester. The examination committee is composed of the Honors project supervisor and two additional faculty members; at least one member of the examination committee must be a faculty member affiliated with the CSET program. The oral examination is public and should take approximately one hour, including time for questions from members of the committee. The faculty examination committee will determine by majority vote whether the student has earned Honors and whether said student should receive Honors or, for exceptional achievement, Highest Honors. Highest Honors is reserved for students whose projects are of dissemination quality and whose oral examinations are completed at the highest level.

Minor in Communication of Science and Technology

The minor in Communication of Science and Technology consists of six courses, totaling a minimum of 18 credit hours, distributed as follows:

1. One Introduction to the Communication of Science course (requirement #1 of the CSET major);
2. One public speaking course (requirement #2 of the CSET major);
3. One advanced CSET or science communications skills course (requirement #4 of the CSET major);
4. One bridging course (requirement #5 of the CSET major);
5. Two 2100 level or higher natural science courses (as defined in requirement #7 of the CSET major).

Additional notes for the minor in CSET:

- Students in the College of Arts and Science must count at least 15 credit hours for the minor in CSET that are not also used to fulfill any program requirements for any other major or minor in the College of Arts and Science.
- A course can be used only once to fulfill a single CSET requirement, even if it is eligible under more than one CSET requirement.

Course descriptions begin on page 167.

Communication Studies

CHAIR Paul H. Stob
 DIRECTOR OF UNDERGRADUATE STUDIES Claire Sisco King
 PROFESSOR EMERITUS Kassian A. Kovalcheck
 PROFESSORS Bonnie J. Dow, John M. Sloop
 ASSOCIATE PROFESSORS Vanessa B. Beasley, Jeffrey A. Bennett,
 Claire Sisco King, Paul H. Stob, Isaac West
 ASSISTANT PROFESSOR Bohyeong Kim
 PRINCIPAL SENIOR LECTURER M. L. Sandoz (Director of Forensics)
 SENIOR LECTURERS Neil Butt (Director of Debate), John P. Koch
 (Associate Director of Debate), Courtney C. Travers, Dustin A. Wood
 SENIOR LECTURER, RETIRED John English

THE Department of Communication Studies offers a major and a minor that include courses in the following areas: historical and theoretical foundations of communication study, argumentation and oral advocacy, the historical and critical study of public discourse and deliberation, and the analysis of mass media and culture.

The Vanderbilt University Varsity Debate Team competes at national and regional levels. A full program of intercollegiate debate is available for students who choose to participate in forensics.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Communication Studies

Communication studies explores purposive human communication. The Department of Communication Studies is

particularly devoted to an understanding of public discourse in the broadest sense, with an emphasis on the role of persuasion in civil society. To that end the subjects of study range from political discourse to commercial advertisement, from the history of rhetoric to the impact of mass media, from criticism of American public oratory to issues of freedom of speech. The department offers courses involving practice, criticism, and theoretical analysis. Education in these areas has traditionally produced citizen advocates who enter public life in business, law, journalism, and communication.

A major in communication studies requires 30 credit hours of course work. The requirements and options for the major are as follows:

1. Two courses (6 credit hours) in Foundations: 1002 and 1500.
2. One course (3 credit hours) in Argumentation and Advocacy: 2100, 2110, 2120.
3. Three courses (9 credit hours) in Public Discourse and Deliberation: 3000, 3001, 3002, 3110, 3120, 3140, 3200, 3600, 3700, 3750; one of which must be 3000, 3001, or 3002.
4. Three courses (9 credit hours) in Culture, Theory, and Critique: 2800, 2950, 3100, 3150, 3620, 3620W, 3710, 3720, 3730, 3730W, 3740, 3800.
5. One elective course (3 credit hours), selected from the courses listed in requirements 2 through 4, which has not been counted toward those requirements.

1111, 3840, 3850, 3890, 4960, and 4961 may be counted toward the major in the category corresponding to the topic of the course, with the permission of the director of undergraduate studies.

Minor in Communication Studies

A minor in communication studies requires completion of 18 credit hours from the following requirements and options:

1. Two courses (6 credit hours) in Foundations: 1002 and 1500.
2. One course (3 credit hours) in Argumentation and Advocacy: 2100, 2110, 2120.
3. Three courses (9 credit hours) from requirements 3 and 4 in the major; one of which must be 3000, 3001, or 3002.

1111, 3840, 3850, 3890, 4960, and 4961 may not be counted toward the minor.

Course descriptions begin on page 167.

Earth and Environmental Sciences

CHAIR Steven L. Goodbred

DIRECTOR OF UNDERGRADUATE STUDIES Lily L. Claiborne

DIRECTOR OF GRADUATE STUDIES David J. Furbish

PROFESSORS EMERITI Leonard P. Alberstadt, Calvin F. Miller, Molly Fritz

Miller, Arthur L. Reesman, William G. Siesser, Richard G. Stearns

PROFESSORS John C. Ayers, Ralf Bennartz, David J. Furbish, Steven L.

Goodbred, Guilherme Gualda, George M. Hornberger

ASSOCIATE PROFESSORS Larisa R. G. DeSantis, Jonathan M. Gilligan,

Jessica L. Oster

ASSISTANT PROFESSORS Hiba Baroud, Simon A. F. Darroch, Ravindra

Duddu, Kristen E. Fauria, Jesus Gomez-Velez, Maria Luisa Jorge,

Neil P. Kelley

RESEARCH ASSISTANT PROFESSORS Garrett W. Tate, Christopher P.

Vanags

PRINCIPAL SENIOR LECTURER Daniel J. Morgan

SENIOR LECTURER Lily L. Claiborne

THE Earth and environmental sciences are aimed at understanding Earth's governing processes—how they operate and interact—as well as interpreting Earth's dynamic history—its age and origin as recorded in rocks and the landscape—and finally, at understanding how geological processes affect modern environmental and ecological systems, including humans. Among the natural sciences, ours is the quintessential interdisciplinary science, providing vital perspective on how Earth's physical and geochemical template simultaneously sustains and threatens life, and influences human interactions with Earth.

The Department of Earth and Environmental Sciences (EES) offers an undergraduate major leading to the B.A. degree. Students majoring in EES take a core set of lab science courses with field components, then propose a course plan that creates an area of concentration in solid Earth, Earth surface, or environmental science while maintaining breadth across the discipline. The comparatively small size of the faculty and student body allows many opportunities for faculty-student interaction. Students use the major as preparation for graduate study, for careers in environmental science, geology, and natural resource and energy exploration, and for related fields such as land use planning, teaching, conservation, business, law, or engineering.

Research programs in the department, which in many cases involve students, employ field, analytical, and experimental methods. A wide variety of Earth processes are investigated, ranging from the migration of fluids and generation of magmas in the Earth's crust, to the movement of mass and energy across land, ocean, and atmosphere, to the evolution of life and ecosystems, to the impacts of humans on the environment. Study areas, in addition to Tennessee, include the southwestern United States, the Pacific northwest, the southern Appalachians, Florida, Antarctica, South Asia, Brazil, Peru, Namibia, the Bahamas, Australia, and New Zealand.

For students with primary interests in environmental issues, there are three options. A student may major in EES with an environmental focus or may construct an individualized interdisciplinary major outside of the department. Alternatively, a student may major in another conventional discipline and augment that with an Earth and environmental sciences minor.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Earth and Environmental Sciences

The EES major is designed to provide a solid grounding in the Earth and environmental sciences while allowing flexibility in the particular focus. The major is organized into five parts, beginning with one of two introductory courses that serve as entry points. The second part involves three core courses with labs that provide all majors with a common background. At least one core course must be completed before students may enroll in the more advanced focus courses of part three. Also, prior to taking any focus courses, students must submit a one-page course plan for parts three and four that explains their choice of advanced courses based on expressed goals and interests. The course plan should be designed in consultation with a faculty adviser and must be approved by the director of undergraduate studies. In most cases, students will also declare the major at this time. The third part of the major defines a focus in the general areas of solid Earth, Earth surface, or environmental science. A brief description of each focus and a list of most relevant courses are given below. The fourth part follows the focus and allows three qualified electives to pursue depth in the focus or broaden to include another area of concentration. The fifth component of the major is a 1 credit hour seminar that serves as a capstone for senior students. In addition to the major, qualified students may elect to participate in the Honors Program designed for highly motivated students who want to pursue research as undergraduates. Opportunities for research may be available to other students outside of the Honors Program.

At least 37 credit hours toward the major are required as follows:

1. Introductory Course (3+1 credit hours each):
1510/1510L or 1030/1030L 4
 2. Core Courses with Lab (3 or 4 credit hours each):
2510, 2550, and 2580 (2550 was formerly 3250) 11
Note: Math 1100, 1201, or 1301 are prerequisite or corequisite for 2550 and 2580. Math 1100 provides the basic calculus skills required for the EES major but does not qualify students for any more advanced math courses at Vanderbilt. Math 1301 is recommended for students interested in taking additional math courses or calculus-based physics that may be suggested by some graduate programs.
 3. Focus Courses with Lab (4 credit hours each):
Three of the following per the approved course plan:
3220, 3260, 3280, 3310, 3330, or 3340 12
 4. Three electives, at least two at 4000 level (3 or 4 credit hours each):
An additional 3000-level course, or 4420, 4550, 4600, 4650, 4680, 4750, 4760, 4820, 4830, or 4891 9–10
Note: Does not include Directed and Independent Studies: 3841, 3842, 3851, or 3852
 5. Senior Seminar:
4961 1
- Total hours: 37–38

Additional supporting science and math courses are highly recommended for the major. Courses in chemistry, physics, math and possibly biological sciences are recommended and may be required for admittance into graduate school or for employment. Recommended selections include:

Chemistry (1601/1601L and 1602/1602L)

Physics (1601/1601L and 1602/1602L)

Calculus (Math 1200/1201, 1300/1301, or higher)

Biological Sciences (1100/1100L, 1103, 1510/1510L, 1511/1511L, 2218, 2219, or 2238/2238L)

Options for Area of Focus

In-depth Earth and Environmental Sciences courses can be chosen to define a focus area within EES. Students should consult with their major adviser about choosing a focus area and associated course options. Students may also formulate an individualized focus area that may incorporate components of several areas to maintain breadth. All parts of the Earth are interconnected, and students are encouraged to maintain some breadth in their plan to create a comprehensive understanding of the cycling of energy and materials through Earth's spheres. Further descriptions of these focus options and recommended courses can be found in the EES major handbook on the EES department homepage.

Solid Earth Focus

This focus area most closely reflects a traditional geology degree, focusing on the processes and history of the Earth as recorded in its rocks, how those rocks are formed and how they change with changing conditions. Focus and elective courses appropriate for Solid Earth include: 3260, 3340, 3330, 3220, 4420, 4550, 4600, 4830.

Earth Surface Focus

This focus area considers interactions between Earth's land surface, oceans, and atmosphere, for example governing how rivers, mountains, coasts, or the climate operate and evolve with time. Earth surface systems also define the planet's critical zone that supports life and its ecosystems. Focus and elective courses appropriate for Earth Surface include: 3330, 3220, 3280, 4420, 4600, 4550, 4650, 4680.

Environmental Focus

This focus considers aspects of the hydrosphere, biosphere, atmosphere, and coupled human-environment systems, both present and past. Life on Earth impacts and is impacted by Earth's environments and is therefore central to this focus. Focus and elective courses most appropriate for Environmental include: 3220, 3280, 3310, 4650, 4680, 4820, 489, 4750, 4760.

Honors in Earth and Environmental Sciences

The EES Honors Program provides research experience and mentoring in preparation for a career or graduate studies in Earth and environmental sciences. Interested students should apply to the undergraduate adviser for entry into the Honors Program fall semester, junior year. A grade point average of 3.3 or higher both cumulatively and in courses that count toward the EES major is required for admission to the Honors Program.

Working closely with a faculty adviser, students in the Honors Program complete a research project of interest to both the student and faculty member during the senior year. In order to graduate with honors in EES, a student must: (1) maintain a 3.3 grade point average both in the EES major and cumulatively; (2) complete the required courses for the EES major; (3) complete Senior Honors Seminar (4996, 4997) and Senior Honors Research (4998, 4999); (4) satisfactorily present the results of his/her research in written form as a senior thesis to two members of the faculty and orally to students and faculty of the department.

Minor in Earth and Environmental Sciences

The minor in EES provides students with a broad background in Earth processes, systems, and history, and an introduction to environmental issues. This background is highly relevant to many different fields of endeavor. The minor does not, however, fully prepare students for graduate studies or employment as Earth scientists. Students should consult with the director of undergraduate studies about how the minor in EES fits with their career or graduate school interests.

The minor consists of at least five courses (at least 17 credit hours; EES 1510/1510L and 1030/1030L each count as one course). Although EES 1510 (with 1510L) and 1030 (with 1030L) are highly recommended, students are encouraged to choose courses based on their interests and career plans and to discuss course selection with the director of undergraduate studies. No more than two 1000-level courses count toward the minor. Two courses with labs are required; one must be numbered above 2000. No credit toward the minor is given for EES 3841–3842 or 3851–3852.

Licensure for Teaching

EES majors may choose a second major in science education which includes teaching licensure, a prudent choice if interested in teaching. Peabody offers a fifth-year master's program for science majors interested in teaching. Upon graduating with a B.A. in EES, EES majors in the fifth-year program would spend the next summer and academic year earning their M.Ed. and teaching licensure.

Students seeking teacher certification in science disciplines at the secondary level should refer to the chapter on Certification for Teaching in the Peabody College section of the *Undergraduate Catalog*. Please contact Professor Heather Johnson, coordinator of science secondary education, at heather.j.johnson@vanderbilt.edu for more information.

Course descriptions begin on page 169.

Economics

CHAIR Peter L. Rousseau
 VICE CHAIR Joel Rodrigue
 DIRECTOR OF UNDERGRADUATE STUDIES Rupinder Saggi
 DIRECTOR OF GRADUATE STUDIES Mattias Polborn
 PROFESSORS EMERITI Jeremy Atack, William W. Damon, Andrew F. Daughety, T. Aldrich Finegan, Malcolm Getz, Cliff J. Huang, Andrea Maneschi, Jennifer F. Reinganum, Clifford S. Russell, John J. Siegfried, George H. Sweeney, Anthony M. Tang
 PROFESSORS Kathryn H. Anderson, Eric W. Bond, Christopher (Kitt) Carpenter, William J. Collins, John Conley, Mario Crucini, Robert A. Driskill, Benjamin Eden, Kevin X. D. Huang, Gregory Huffman, Atsushi Inoue, Tong Li, David Parsley, Mattias Polborn, Peter L. Rousseau, Kamal Saggi, W. Kip Viscusi, John A. Weymark, Myrna Wooders
 PROFESSORS, RETIRED John Vrooman, Diana N. Weymark
 ASSOCIATE PROFESSORS Andrea Moro, Joel Rodrigue, Yuya Sasaki, Lesley J. Turner
 ASSISTANT PROFESSORS Brian Beach, Andrew Dustan, Andrew Goodman-Bacon, Federico H. Gutierrez, Eun Jeong Heo, Malin Hu, Gregory Leo, Michelle Marcus, Kathleen McKiernan, Analisa Packham, Sarah Quincy, Pedro Sant'Anna, Matthew Zaragoza-Watkins, Ariell Zimran
 PRINCIPAL SENIOR LECTURERS Ana Regina Andrade, Stephen G. Buckles, Christina H. Rennhoff, Rupinder Saggi
 SENIOR LECTURERS Kent Dolezal, Hojjatallah Ghandi, Heather Luea, Adugna Olani, Zaruhi Sahakyan

THE Department of Economics offers an undergraduate major and minor in economics. Qualified economics majors may also elect to take graduate courses or participate in honors work.

The department participates with the Department of History in a concentration in economics and history. Other economics-related minors are discussed under Managerial Studies.

Economics 1010 and 1020 are prerequisites to all courses numbered above 2000, except Economics 2220 which only requires Economics 1010.

The description of the Concentration in Economics below will apply to students who matriculate at Vanderbilt in August 2018 and thereafter.

Program of Concentration in Economics

The requirements for the major include completion of at least 33 credit hours in economics courses, including 1010, 1020, 1500 or 1510 (or Math 2820L with Math 2810 or Math 2820), 3012, 3022, and 3032 or 3035. At least 9 credit hours must be in courses numbered above 3035. At least 15 credit hours that count toward the economics major must be taken at Vanderbilt. Financial Economics (FNEC) courses do not count toward the economics major. Economics 1111 may be counted as an elective. No more than 3 credit hours of independent study may be included in the minimum 33 credit hours required for the major.

Mathematics Prerequisite

MATH 1201 (or MATH 1301) is a prerequisite for Economics courses numbered 3000 and above.

Minor in Economics

The minor in economics requires 21 credit hours, including 1010, 1020, 1500 or 1510 (or Math 2820L with Math 2810 or

Math 2820), 3012, and 9 credit hours of electives. At least one elective must be numbered above 3015. Students who complete either Economics 3032 or 3035 with Math 2820L and Math 2810 or Math 2820 as a prerequisite need not take Economics 1500 or 1510. Financial Economics (FNEC) courses do not count toward the economics minor.

Honors Program

An honors program is available in economics. This program is designed for highly motivated students interested in doing independent research. Students who meet the College of Arts and Science's requirements for honors candidacy as set forth elsewhere in this catalog should consult the director of undergraduate studies no later than the fall term of their junior year. Honors candidates must complete 36 credit hours in economics, including the 18 credit hours of courses required of all economics majors. Honors candidates should complete 3032 or 3035 before senior year. In addition, the Honors Program requires completion of (1) Economics 3698 Junior Honors Research (1 credit hour), (2) Economics 3851–3852 Senior Thesis (6 credit hours), culminating in a written thesis, (3) Economics 4981–4982 Honors Seminar (2 credit hours), (4) 9 credit hours of electives including at least 6 credit hours in Economics courses above 3035. Honors candidates are required to write a senior thesis and to defend it in an oral examination. On satisfactory completion of this program, a student will graduate with honors or with highest honors in economics.

Program of Concentration in Economics and History

This is an interdisciplinary program split between Economics and History that provides a more focused program of study while requiring fewer credit hours than a double major in the two fields. The program consists of 45 credit hours of course work of which 9 credit hours are from a common economic history core and the remaining 36 credit hours are evenly divided between Economics and History. Students are expected to observe course-specific requirements in each department. The details are spelled out below under Economics and History.

Licensure for Teaching

Candidates for teacher licensure in economics at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Course descriptions begin on page 171.

Economics and History

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The joint major in economics and history makes an important contribution to liberal education at Vanderbilt by helping students understand the origins and organization of modern society. It also provides a unique preparation for careers in business, the professions, and other fields by combining all the analytical tools of the regular economics major with history's emphasis on clear and effective writing and on developing

skills in gathering, assessing, and synthesizing information. The program consists of 45 credit hours of course work: 9 credit hours in an economic history core, and an additional 18 credit hours in economics and 18 in history. Students declare their major through the Department of History office.

Note: One semester of calculus is a prerequisite for ECON 1500 and 1510. MATH 1201 (or MATH 1301) is a prerequisite for Economics courses numbered 3000 and above.

The description of the Concentration in Economics and History below will apply to students who matriculate at Vanderbilt in August 2018 and thereafter.

Course work for the major is distributed as follows:

Economic History Core (9 credit hours)

Three of the following courses, one of which must be an economics course above 3000:

HIST 1352, 1600, 1640, 1660, 1665, 2111, 2138, 2150, 2255, 2660, 2700, 3190, 3200, ECON 2150, 3150, 3160.

Note: ECON 3012 is a prerequisite for ECON 3150, and 3160.

Economics (18 credit hours)

ECON 1010, 1020, 1500 or 1510, 3012, 3022; one ECON course above 3022 not included in the economic history core.

Note: The following course sequences may be substituted for ECON 1500 or 1510:

Option 1: MATH 2810, 2820L, and either ECON 3032 or 3035.

Option 2: MATH 2820, 2820L, and either ECON 3032 or 3035. In these cases, ECON 3032 or 3035 will also count as an elective.

History (18 credit hours)

No more than 3 credit hours of AP or IB credit in history courses may count toward this total.

- (1) History 3000W or 3980; must be taken by the end of the junior year. 3980 is limited to second-semester juniors who have been admitted to the Honors Program. Students entering the Honors Program who have already earned credit for 3000W will receive elective credit for that course.
- (2) History 4960 (prerequisite: History 3000W), or History 4980–4981 (available only to students in the Honors Program). *Note:* At the discretion of the director of honors and the director of undergraduate studies in history, a student who has earned credit for 4980 but does not take 4981 may be considered to have fulfilled the capstone requirement for the major.
- (3) Four other history courses not included in the economic history core. Electives may include any courses, not used to satisfy any of the above requirements, offered by the Department of History, including any courses listed for the history major.

Honors Program (9 more credit hours)

Students apply to the Honors Program in History in the first semester of the junior year.

54 credit hours: students will take the four-course honors sequence, HIST 3980, 4980–4981, 4999. Because HIST 4980–4981 satisfies the capstone requirement, honors students

will not be required to take HIST 4960, though they may enroll for 4960 as an elective. Students will write an interdisciplinary thesis under the direction of an adviser from each department.

English

CHAIR Dana Nelson

DIRECTOR OF UNDERGRADUATE STUDIES Lynn Enterline

DIRECTOR OF CREATIVE WRITING PROGRAM Kate Daniels

PROFESSORS EMERITI Vereen M. Bell, Paul Elledge, Roy K. Gottfried, R. Chris Hassel Jr., Michael Kreyling, Leah S. Marcus, John F. Plummer III, Harold Lerow Weatherby Jr.

PROFESSORS Houston Baker, Jay Clayton, Kate Daniels, Colin (Joan) Dayan, Tony Earley, Lynn E. Enterline, Jennifer Fay, Sam B. Girgus, Valerie Hotchkiss, Mark Jarman, Vera Kutzinski, Jonathan Lamb, Lorraine Lopez, Lorrie Moore, Dana D. Nelson, Mark Schoenfield, Kathryn Schwarz, Hortense Spillers, Cecelia Tichi, Mark A. Wollaeger

ASSOCIATE PROFESSORS Teresa A. Goddu, Rick Hilles, Scott Juengel, Emily Lordi, Ifeoma Nwankwo, Bridget Orr, Anthony Reed, Nancy Reisman, Allison Schachter, Rachel Teukolsky, Ben Tran

ASSISTANT PROFESSORS Candice Amich, Jessie Hock, Marzia Milazzo, Akshya Saxena, Haerin Shin

PRINCIPAL SENIOR LECTURERS Julia Fesmire, Roger Moore

SENIOR LECTURERS Gabriel Briggs, Elizabeth Covington, Alex Dubilet, Andrea Hearn, Judith Klass, Elizabeth Meadows, Justin Quarry

WRITERS IN RESIDENCE Beth Bachmann, Piyali Battacharya, Sheba Karim, Amanda Little, Sandy Solomon

WRITER IN RESIDENCE, RETIRED Peter Guralnick

THE Department of English offers three distinct programs that allow students to individualize their studies while acquiring the breadth of knowledge and skills of the traditional English major. The curriculum provides courses in the history of British and American literature, in Anglophone literatures of other countries, in literary theory, and in expository as well as creative writing. These diverse courses reflect the interests of students and faculty and the expanding area of English literary study. Students use the concentration in English as a foundation for a variety of careers where the analytic, reading, and writing skills gained are especially valued, and as preparation for postgraduate work in literature. The department also regards its goals as helping students become readers of literature and culture throughout their lives.

Programs in England, Scotland, Australia, and around the world offer opportunities for study and travel that enrich a student's education. The Gertrude Vanderbilt and Harold S. Vanderbilt Visiting Writers Series annually sponsors public lectures, readings, and other occasions where English majors hear and meet celebrated poets, novelists, and critics. Many majors write for and serve on the editorial boards of various campus publications including the *Hustler* paper and the *Vanderbilt Review*, a distinguished collection of creative writing. An English majors listserv alerts students to employment opportunities, internships, and study abroad programs in addition to those offered through Vanderbilt University.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in English and American Literature

Program I: Literary Studies (30 credit hours)

Students pursue a broad range of interests through a flexible approach to the study of literature. 30 total credit hours including:

1. 6 credit hours in History (literature before 1800)
2. 6 credit hours of Diverse Perspectives (ethnic American or Anglophone literature)
3. 18 additional credit hours of electives in English, chosen from the courses that count toward the major

A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the requirement in numbers 1, 2, and 3 above are described below under General Requirements and Advice for Majors and Minors in All Programs.

Program II: Creative Writing (30 credit hours)

Students develop their creative writing while acquiring an overview of English literature. 30 total credit hours including:

1. 12 credit hours of 3000-level creative writing workshops in at least two different genres (from among: Nonfiction 3210, 3220; Fiction 3230, 3240; Poetry 3250, 3260). Admission to these courses is by consent of instructor.
2. 3 credit hours in History (literature before 1800)
3. 3 credit hours in Diverse Perspectives (ethnic American or Anglophone literature)
4. 12 credit hours from courses that count toward the English major (see below), which may include one additional creative writing workshop (beyond the four required in number 1, above) or one course in another discipline (with approval of the director of undergraduate studies)

A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the requirement in numbers 2, 3, and 4 above are described below under General Requirements and Advice for Majors and Minors in All Programs.

Program III: Specialized Critical Studies (30 credit hours)

Students design their own specialized course of study with a descriptive name and develop a contract of courses for it. 30 total credit hours including:

1. 12 credit hours of course work concentrated in a particular period (e.g., nineteenth-century American), genre, or movement (e.g., the novel), an aspect of intellectual history (e.g., law and literature, literary theory), or other area of special interest. Up to 9 credit hours may be taken in courses from other departments relevant to the concentration. In consultation with a major adviser, each student selects specific courses, which are listed in a contract that is filed after the student has formally declared the major.
2. 6 credit hours in History (literature before 1800)
3. 6 credit hours in Diverse Perspectives (ethnic American or Anglophone literature)

4. 6 credit hours from any of the courses that count toward the English major.

A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the requirement in numbers 2, 3, and 4 above are described below under General Requirements and Advice for Majors and Minors in All Programs.

Minors Offered

Minor in English: Literature

At least 18 credit hours of course work in English are required. These courses must include 3 credit hours from History (literature before 1800) and 3 credit hours of Diverse Perspectives (ethnic American or Anglophone literature).

A course cannot be used to satisfy more than one requirement in the minor.

Minor in English: Creative Writing

At least 18 credit hours of course work in English are required. These courses must include three upper-level workshops (9 credit hours) in any genre (3210, 3220, 3230, 3240, 3250, or 3260).

General Requirements and Advice for Majors and Minors in All Programs

All courses numbered 2050 and above (except 4999) count toward the major. Additionally, students may elect to count one of the following 1000-level courses toward their major: 1111, 1210W, 1220W, 1230W, 1240, 1250W, 1260W, 1270W, 1280, 1290, English 3890, 3890W, 3892, 3892W, 3894, 3894W, and 3898 may be repeated for credit when the topics are different. The survey courses, 2310, 2311, 2316, 2316W, 2318, 2318W, 2319, and 2319W are recommended for sophomores to provide a background for advanced courses.

Note: A course cannot be used to satisfy more than one requirement in the major.

Courses that fulfill the *History requirement* (literature before 1800) include 2310, 2318, 2318W, 3310, 3314, 3316, 3318, 3330, 3332, 3335, 3335W, 3336, 3337, 3340, 3340W, 3346, 3348, 3360, 3361, 3364, 3370.

Courses that fulfill the *Diverse Perspectives requirement* (ethnic American or Anglophone literature) include 3650, 3650W, 3654, 3654W, 3658, 3662, 3662W, 3664, 3670, 3670W, 3674, 3678, and appropriate courses from other departments as approved by the director of undergraduate studies.

Courses that fulfill the *Program II creative writing workshop requirement* include 3210, 3220, 3230, 3240, 3250, 3260.

In addition, suitable sections of 3890, 3890W, 3892, 3892W, 3894, 3894W, 3746, 3898, 3898W, 4998, 4999, (as appropriate) and other courses may fulfill the categories listed. Detailed course descriptions appear on the Department of English website for the upcoming semester and are available in the department. Majors are required to consult with their advisers during registration to identify what specific requirements the courses offered in that semester might fulfill.

One course from another department, appropriate to the student's course of study, may be counted toward the requirements of any program with permission of the director of undergraduate studies; for Program III, this course may be in addition to the 9 credit hours already allowed from other departments.

Honors Program

To graduate with honors in English, students must (a) complete all the requirements of the English major, with at least 6 credit hours in honors sections (an appropriate graduate seminar or seminar in a study abroad program may be substituted for one honors seminar); (b) 3 credit hours of 4998; (c) maintain at least a 3.4 grade point average overall and 3.6 in the major; (d) be admitted to the Honors Program in the spring of the junior year; (e) write a thesis (4999) and pass an oral examination about its subject in the spring of the senior year. For secondary education double-majors, EDUC 9700 can be substituted for 4999 with the consent of the director of undergraduate studies.

To comply with all requirements, every honors student will complete 33 credit hours. Exceptional achievement on the thesis will earn highest honors. Majors who wish to apply to the Honors Program must be within 6 credit hours of completing all AXLE requirements, must have made reasonable progress toward the major, and must have at least a 3.4 grade point average overall and 3.6 in the major. Applications are accepted in April of the junior year. Additional information is available from the director of undergraduate studies. Students need not be enrolled in the Honors Program to take honors sections. Honors sections are seminars open to any student beyond the freshman year who has completed the sophomore writing requirement of AXLE and has earned at least a 3.4 grade point average. Students are encouraged to enroll in honors sections prior to applying to the program.

Licensure for Teaching

Candidates for teacher licensure in English at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Course descriptions begin on page 173.

Environmental and Sustainability Studies

DIRECTOR David Hess

HUMAN beings and their societies necessarily interact with and alter the Earth's natural environment. The environmental and sustainability studies minor allows the student to examine human interaction with the environment from the perspectives of the humanities and social sciences with some exposure to the environmental sciences and/or environmental engineering.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Minor in Environmental and Sustainability Studies

Students who want to minor in environmental and sustainability studies must take a minimum of six courses (18 credit hours total) chosen from the courses listed below; additional relevant courses may be counted with approval of the director of the program. Courses must be distributed as follows: (A) one Natural Science- and Technology-Intensive course; (B) one Humanities course; (C) one Social-Behavioral Sciences and Policy-Intensive

course; (D) two additional courses from B and/or C; and (E) a capstone course. No more than two courses may be at the 1000 level. In addition, no more than 3 credit hours may be counted simultaneously toward both the environmental and sustainability studies minor and any other major or minor. Topics courses may count toward the minor with approval of the director.

A) *Natural Science- and Technology-Intensive Courses*: BSCI 1103, BSCI 2238, BSCI 2238L, BSCI 3233, EES 1030, EES 1070, EES 1080, EES 1111*, EES 1510, EES 1510L, EES 2110, EES 2150, EES 2510, EES 3220, EES 3220W, EES 3310, EES 4650, EES 4680, EES 4750, EES 4760, EES 4820, ENVE 3610, ENVE 4615, ENVE 4700, ES 1115*

B) *Humanities Courses*: AMER 1111*, AMER 4000*, AMER 4100*, ENGL 2316/2316W*, ENGL 3720/3720W*, ENGL 3730, ENGL 3898/3898W*, HART 2150, HART 3240W, HART 2782, HART 3790, HIST 1470, HIST 1480, HIST 1520, HIST 2413, HIST 2413W, PHIL 1111*, PHIL 3611, PHIL 3612, RLST 2472, RLST 3921, WGS 2268, WGS 2270

C) *Social-Behavioral Sciences and Policy Intensive Courses*: ANTH 1111*, ANTH 2109, ANTH 2150, ANTH 2220, ANTH 2220W, ANTH 2227, ANTH 3138, ANTH 3261, ANTH 4154, ECON 2170, HOD 3270, PSCI 3266, PSY 1111*, SOC 1020/1020W*, SOC 1030, SOC 1111*, SOC 3311, SOC 3312, SOC 3313, SOC 3314, SOC 3315, SOC 3316, SOC 3317, SOC 3318, SOC 3319, SOC 3321, WGS 1111*

D) Two additional courses from lists B and/or C above.

E) *Capstone*: ENVS 4101 or ENVS 4101W, for minors only

*Special topic and First-Year Writing Seminar sections require the approval of the director of the environmental and sustainability studies minor to count in the minor.

Course descriptions begin on page 177.

European Studies

DIRECTOR Ari Joskowicz

PROFESSORS Michael Bess, Joy H. Calico

ASSOCIATE PROFESSORS Emily Greble, Ari Joskowicz, Meike Werner,

Christoph Zeller

VISITING ASSOCIATE PROFESSOR Torben Lütjen

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in European Studies

Designed for students who seek to broaden their understanding of European societies and to prepare for international careers or advanced study, the Program in European Studies (EUS) offers disciplinary breadth as well as expertise in a specialty of students' choosing. Most EUS majors also participate in one of the Vanderbilt study abroad programs in Europe and/or reside in the International House on campus.

In consultation with an adviser in European Studies, students choose a focus and specific courses that will fulfill the requirements for the major. This focus can consist of a thematic or comparative topic (such as Central European

literature or Law and Economics in the European Union) or the culture and society of a particular nation (such as France, Germany, Italy, Poland, Spain). In addition to the core requirements, majors take relevant courses in history, social sciences, and the humanities, as well as a foreign language of the student's choice.

The Program in European Studies sponsors special activities including a visiting lecture series, international symposia, and informal faculty-student luncheon seminars.

Required Core Courses (12 credit hours)

- EUS 2201, European Society and Culture or EUS 2203, The Idea of Europe (3 credit hours)
- EUS 4960, Senior Tutorial (3 credit hours)
- 6 credit hours in European Studies courses or equivalent approved by major adviser

Foreign Language Requirement (6 credit hours)

The foreign language requirement is to be satisfied in one of the following ways:

- 6 credit hours of course work at the intermediate level in one European language;
- course work through the beginner level in two European languages;
- demonstration of proficiency equivalent to either of the preceding options; or
- participation for at least one fall or spring semester in a Vanderbilt study abroad program in Europe (students participating in the Vanderbilt in England program must complete course work through the intermediate level in one European language, or demonstrate equivalent proficiency).

European languages recognized for the major include Albanian, Bulgarian, Czech, Croatian/Bosnian/Serbian, Danish, Finnish, French, German, Greek, Hungarian, Ladino (Judeo-Spanish), Italian, Norwegian, Polish, Portuguese, Romani, Romanian, Russian, Slovak, Spanish, Swedish, Turkish, and Yiddish. Other languages may be approved by the major adviser.

Electives (12–18 credit hours)

The remainder of the 30 credit hours required for the major may be selected from the list of courses below or from among approved courses taken abroad. Students majoring in EUS are advised to select courses from the social sciences and humanities that complement their areas of special interest and their thematic focus.

Other Issues Relating to the Major

Normally, no more than 6 credit hours of work in 1000-level courses may be counted toward the major. Students who have fulfilled their language requirements by demonstrating equivalent proficiency or through participation in a Vanderbilt study program in Europe may also count up to two language courses in a European language toward their major.

Students seeking a second major may count a maximum of 6 credit hours of course work to meet requirements in both majors.

Honors Program

The Program in European Studies offers qualified majors the option of completing a portion of their major requirements in an Honors Program. Students engage in interdisciplinary reading, consultations with faculty, and research on the overarching theme of their program of concentration. To be admitted to the program students must have attained a minimum cumulative grade point average of 3.300 and a minimum grade point

average of 3.300 in all courses that count toward the EUS major; identify an adviser for the thesis; submit a detailed description of their proposed program of study for approval of the director of EUS; complete 3 credit hours of independent research (normally EUS 4998); complete 3 credit hours of credit in EUS 4960, Senior Tutorial, that involves researching and writing a senior honors thesis of approximately fifty pages; successfully defend the honors thesis before a committee normally consisting of the adviser, the director of EUS, and another faculty member. Information concerning the Honors Program is available from the director of EUS. College regulations governing honors programs may be found in this catalog under Honors Programs, Special Programs for Arts and Science.

The Minor in European Studies

The EUS minor is a good complement to a major in anthropology, history, economics, literary studies, philosophy, and political science. It involves 18 credit hours of course work with concentration and distribution requirements similar to those for the major, but on a reduced scale. A background in a modern foreign language is highly recommended. Students choose a thematic focus and take approved European content courses distributed as follows:

- EUS 2201, European Society and Culture, or EUS 2203, The Idea of Europe
- 6 additional credit hours selected from EUS-labeled courses (or approved substitute)
- 9 hours of topical courses on Europe, approved by the major adviser

The minimum number of credit hours required for the minor is 18.

Joint Major Option

The Program in European Studies collaborates with several departments to create joint majors in French and European Studies, German and European Studies, Italian and European Studies, Russian, East European and European Studies, Spanish and European Studies, and Spanish, Portuguese, and European Studies. These options are offered as collaborations between the Program in European Studies and the Departments of French and Italian, German, Russian, and East European Studies, and Spanish and Portuguese, and consist of 30 credit hours of course work each. Please see the detailed information on the joint major options under the departmental headings in this catalog. Students selecting one of these options will be advised by their major adviser in the language department as well as their adviser in the Program in European Studies.

List of Approved Courses with European Content

Because the curricular offerings are constantly changing, prospective majors and minors should consult with the director about appropriate substitutes for courses listed below.

ANTHROPOLOGY: 3371, Social and Health Consequences of Pandemics.

CLASSICS: 3120, Humor, Ancient to Modern.

COMMUNICATION STUDIES: 3600, The Rhetorical Tradition.

ECONOMICS: 3160, Economic History of Europe; 3600, International Trade; 3610, International Finance.

ENGLISH: 1111, First-Year Writing Seminar (with appropriate topic); 2310, British Writers to 1660; 2311, British Writers 1660–Present; 3310, Anglo-Saxon Language and Literature; 3314, Chaucer; 3316, Medieval Literature; 3330, Sixteenth Century; 3332, English Renaissance: The Drama; 3335W, English Renaissance Poetry; 3336, Shakespeare: Comedy and Histories; 3337, Shakespeare: Tragedy and Romance; 3340, Shakespeare: Representative Selections; 3340W, Shakespeare: Representative Selections; 3346, Seventeenth-Century Literature; 3348, Milton; 3360, Restoration and the Eighteenth Century Early; 3361, Restoration and Eighteenth Century Late; 3364, The Eighteenth-Century English Novel; 3370, The Bible in Literature; 3610, The Romantic Period; 3611, The Romantic Period; 3614, The Victorian Period; 3618, The Nineteenth-Century English Novel; 3630, The Modern British Novel; 3634, Modern Irish Literature; 3640, Modern British and American Poetry: Yeats to Auden; 3681, Twentieth-Century British and World Drama; 3683, Contemporary British Literature; 3740, Critical Theory; 3890, Movements in Literature (with appropriate topic); 3890W, Movements in Literature (with appropriate topic); 3892, Problems in Literature (with appropriate topic); 3892W, Problems in Literature (with appropriate topic); 3894, Major Figures in Literature (with appropriate topic); 3894W, Major Figures in Literature (with appropriate topic); 3898, Special Topics in English and American Literature (with appropriate topic); 3898W, Special Topics in English and American Literature (with appropriate topic).

EUROPEAN STUDIES: 2201, European Society and Culture; 2203, The Idea of Europe; 2208, Conspiracy Theories and Rumors in European and U.S. History; 2213, Introduction to European Intellectual Traditions: Ancient and Medieval; 2220, Religion and Politics in Modern Europe, 1648–Present; 2240, Topics in European Studies; 2260, European Cities; 2800, Pursuing Utopia: Social Justice and Romanticism in the Alps.

FRENCH: 2501W, French Composition and Grammar; 2614, Advanced Conversational French; 2891, Cross Cultural Communication; 3101, Texts and Contexts: Middle Ages to the Enlightenment; 3102, Texts and Contexts: Revolution to the Present; 3111, French for Business; 3112, Medical French in Intercultural Contexts; 3113, Advanced French Grammar; 3180, La Provence; 3181, Contemporary France; 3188, The Contemporary Press and Media; 3222, The Early Modern Novel; 3223, The *Querelles des femmes*; 3224, Medieval French Literature; 3230, French and Francophone Cinema; 3281, Provence and the French Novel; 3286, Cultural Study Tour; 3620, Age of Louis XIV; 3621, Enlightenment and Revolution; 3622, From Romanticism to Symbolism; 3623, The Twentieth-Century Novel; 4025, From Carnival to the “Carnavalesque”; 4027, Emile Zola: From Naturalist Novels to Social Activism; 4029, Twentieth-Century French Literature; 4030, French and Italian Avant-garde; 4221, Literature of the Fantastic; 4232, Literature and Law; 4284, Art and Literature of the Nineteenth Century; 4285, Art and Literature of the Twentieth Century; 4320, French Feminist Thought: Literary and Critical; 4322, Adultery and Transgressions in Literature; 4430, Jews and Arab-Muslims in France; 4432, French Intellectual History.

GERMAN: 1111, First-Year Writing Seminar; 1482, Borders and Crossings: German Literature and Culture from Romanticism to the Present; 2310W, Introduction to German Studies; 2320, Conversation and Composition: Current Events; 2321, Conversation and Composition: Contemporary Culture; 2341, German Culture and Literature; 2342, German Culture and Literature; 2441, Great German Works in English; 2442, War on Screen; 2443, German Cinema: Vampires, Victims, and Vamps; 2444, German Fairy Tales from Brothers Grimm to Walt Disney; 2445, Nazi Cinema: The Manipulation of Mass Culture; 2552, Topics: 18th and 19th Century Culture and Literature; 2553, Topics: 20th and 21st Century Culture and Literature; 2554, Topics in Visual Culture and Media; 3323, From Language to Literature; 3343, The Aesthetics of Violence: Terror, Crime, and Dread in German Literature; 3344, Women at the Margins: German-Jewish Women Writers; 3345, Love and Friendship; 3375, Art and Rebellion: Literary Experiment in the 1960s and 1970s; 3378, Dreams in Literature; 4458, Business German; 4535, German Romanticism; 4537, Women and Modernity; 4548, German Lyric Poetry—Form and Function; 4563, The Age of Goethe-Weimar 1775 to 1805; 4564, Pleasures and Perils in Nineteenth-Century Theatre; 4565,

Revolutionizing Twentieth-Century Theatre; 4566, Nineteenth-Century Prose; 4567, The German Novel from Kafka to Grass; 4569, Writing under Censorship; 4574, Who Am I? German Autobiographies; 4576, Tales of Travel in Modern German Culture.

HISTORY OF ART: 1100, History of Western Art I; 1110, History of Western Art II; 1111, First-Year Writing Seminar (with appropriate topic); 1500W, Impressionism; 2220, Greek Art and Architecture; 2270, Early Christian and Byzantine Art; 2285, Medieval Art; 2310, Italian Art to 1500; 2320W, The Italian Renaissance Workshop; 2325, Great Masters of the Italian Renaissance; 2330, Italian Renaissance Art after 1500; 2360, Northern Renaissance Art; 2362, Fifteenth-Century Northern European Art; 2390, Seventeenth-Century Art; 2600, Eighteenth-Century Art; 2620, Nineteenth-Century European Art; 2622, Neoclassicism and Romanticism; 2650, Nineteenth-Century Architecture: Theory and Practice; 2652, French Art in the Age of Impressionism; 2680, British Art: Tudor to Victorian; 2708, Twentieth-Century British Art; 2710, Twentieth-Century European Art; 2720, Modern Architecture; 2722, Modern Art and Architecture in Paris; 3224, Greek Sculpture; 3226, Greek Vases and Society; 3228W, Gender and Sexuality in Greek Art; 3274, Art and Empire from Constantine to Justinian; 3320, Early Renaissance Florence; 3320W, Early Renaissance Florence; 3332, Raphael and the Renaissance; 3334, Michelangelo's Life and Works; 3334W, Michelangelo's Life and Works; 3364W, The Court of Burgundy; 3366, 16th-Century Northern European Art; 3605W, French Art in the Age of Louis XV: From Rococo to Neoclassicism; 3790, Monumental Landscapes of Provence.

HISTORY: 1111-08, European Imperialism: Colonizer and Colonized in the Modern World; 1350, Western Civilization to 1700; 1360, Western Civilization since 1700; 1390, America to 1776: Discovery to Revolution; 1480, The Darwinian Revolution; 1500, History of Modern Sciences and Society; 1510, The Scientific Revolution; 1580, Crime and Punishment in Early Modern Europe 1400–1800 CE; 1584W, Foreigners and Citizens: Law and Rights in Modern Europe; 1600, European Economic History, 1000–1700; 1700, Western Military History to 1815; 1730, The U.S. and the Cold War; 1760, History of Christian Traditions; 2130, Russia: Old Regime to Revolution; 2135, Russia: The USSR and Afterward; 2220, Medieval and Renaissance Italy, 1000–1700; 2230, Medieval Europe, 1000–1350; 2250, Reformation Europe; 2260, Revolutionary Europe, 1789–1815; 2270, Nineteenth-Century Europe; 2280, Europe, 1900–1945; 2290, Europe since 1945; 2293, Muslims in Modern Europe; 2295, The Migrant Crisis in the Netherlands; 2300, Twentieth-Century Germany; 2310, France: Renaissance to Revolution; 2340, Modern France; 2380, Shakespeare's Histories and History; 2382, The Rise of the Tudors; 2383, A Monarchy Dissolved? From Good Queen Bess to the English Civil War; 2385, The Real Tudors; 2410, Victorian England; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2595W, The English Atlantic World, 1500–1688; 2720, World War II; 2800, Modern Medicine; 2835, Sexuality and Gender in the Western Tradition to 1700; 2840, Sexuality and Gender in the Western Tradition since 1700; 3010, Pornography and Prostitution in History; 3120, Weimar Germany: Modernism and Modernity, 1918–1933; 3150, Cities of Europe and the Middle East; 3180, Making of Modern Paris; 3230, The Art of Empire; 3260, Revolutionary England, 1603–1710; 3270, Religion and the Occult in Early Modern Europe; 3275, Religion and Popular Culture in Nineteenth-Century Europe.

ITALIAN: 1111-01, First-Year Writing Seminar: Italian History and Culture Through Cinema; 2203, Italian Journeys; 2501W, Grammar and Composition; 2614, Conversation; 3000, Introduction to Italian Literature; 3041, Italian Civilization; 3100, Literature from the Middle Ages to the Renaissance; 3240, Dante's *Divine Comedy*; 3242, Dante in Historical Context; 3340, *Famous Women* by Boccaccio; 3500, Baroque, Illuminismo, and Romanticism in Italy; 3600, Twentieth-Century Literature: Beauty and Chaos; 3640, Classic Italian Cinema; 3641, Contemporary Italian Cinema; 3642, Italian Visual Culture; 3701, City Fictions; 3702, Topics in Contemporary Italian Civilization; 3802, Contemporary Italian Society and Culture.

JEWISH STUDIES: 1002, Introduction to Jewish Studies; 1002W, Introduction to Jewish Studies; 1200, Classical Judaism: Jews in Antiquity; 1220, Jews in the Medieval World; 1240, Perspectives in Modern Jewish History; 2250W, Witnesses Who Were Not There: Literature of the Children of Holo-

caust Survivors; 2250W, Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors; 2270, Jewish Storytelling; 2270W, Jewish Storytelling; 2320, Freud and Jewish Identity; 2340, Jewish Philosophy after Auschwitz; 2450, The Jewish Diaspora; 2640, Jews and Greeks; 3100, The Holocaust; 2210W, Hebrew Literature in Translation.

MUSIC LITERATURE AND HISTORY: 1220, The Symphony; 1230, Survey of Choral Music; 2200W, Music in Western Culture; 3220, Opera in the 17th and 18th Centuries; 3221, Opera in the 19th Century; 3222, Mahler Symphonies: Songs of Irony; 3223, Music in the Age of Beethoven and Schubert; 3224, Haydn and Mozart; 3225, Brahms and the Anxiety of Influence; 3227, Music in the Age of Revolution, 1789–1848; 3228, J. S. Bach: Learned Musician and Virtual Traveler; 3229, Robert Schumann and the Romantic Sensibility; 3230, Music and the Construction of National Identity; 3890, Selected Topics in Music History (with appropriate topic).

PHILOSOPHY: 1111, First-Year Writing Seminar (with appropriate topic); 1200, The Meaning of Life; 1200W, The Meaning of Life; 2102, Medieval Philosophy; 2103, Modern Philosophy; 2104 Nineteenth-Century Philosophy; 2109, Twentieth-Century Continental Philosophy; 2110, Contemporary Philosophy; 2660, Philosophy of Music; 3005, Jewish Philosophy; 3007, French Feminism; 3009, Existential Philosophy; 3010, Phenomenology; 3011, Critical Theory; 3013, History of Aesthetics; 3014, Modernistic Aesthetics; 3103, Immanuel Kant; 3104, Kierkegaard and Nietzsche; 3105, Hegel; 3602, Philosophy of History; 3620, Political and Social Philosophy; 3621, Early Modern Political Philosophy; 3622, Contemporary Political Philosophy; 3623, Modern Philosophies of Law.

POLITICAL SCIENCE: 1101, Introduction to Comparative Politics; 1102, Introduction to International Politics; 1103, Justice; 2202, Ancient Political Thought; 2203, History of Modern Political Philosophy; 2210, West European Politics; 2220, Crisis Diplomacy; 2221, Causes of War; 2223, European Political Economy and Economic Institutions; 2225, International Political Economy; 2226, International Law and Organization; 2274, Nature of War; 3211, The European Union; 4238, Comparative Political Parties.

PORTUGUESE: 2203, Intermediate Portuguese; 3301, Portuguese Composition and Conversation; 3892, Special Topics in Portuguese Language, Literature, or Civilization (with appropriate topic).

RELIGIOUS STUDIES: 1111, First-Year Writing Seminar (with appropriate topic); 1820, Religion, Sexuality, Power; 2210W, Constructions of Jewish Identity in the Modern World; 2940, Great Books of Literature and Religion; 3229, The Holocaust: Its Meanings and Implications; 3316, Christianity in the Reformation Era; 3940, The Nature of Evil; 3941, Religion, Science, and Evolution; 4834, Post-Freudian Theories and Religion; 4835, Freudian Theories and Religion; 4836, The Religious Self according to Jung.

RUSSIAN: 1111, First-Year Writing Seminar; 1874, Russian Fairy Tales; 1910W, 19th Century Russian Literature; 1911W, 20th Century Russian Literature; 2210, Russia Today: Politics, Economics, and Culture; 2230, Russia at War; 2273, Russian Science Fiction; 2310, Survey of Russian Literature in English Translation; 2311, Survey of Russian Literature in English Translation; 2434, The Russian Cinema; 2435, Leo Tolstoy: *Anna Karenina* and Other Masterpieces; 2436, Tolstoy's *War and Peace*; 2438, Dostoevsky's Major Novels: Philosophy and Aesthetics; 2537, Vladimir Nabokov; 2639, The Story of Siberia; 2745, Art After Zero: The Russian Avant-Garde; 2800, Viewing Communism in Eastern Europe.

SOCIOLOGY: 3851, Independent Research and Writing (with appropriate topic); 4961, Seminars in Selected Topics (with appropriate topic).

SPANISH: 1111-03, First-Year Writing Seminar: Travel Matters; 2990, Images of the Feminine in Spanish Cinema; 3301W, Intermediate Spanish Writing; 3302, Spanish for Oral Communication through Cultural Topics; 3325, The Way of Saint James; 3340, Advanced Conversation; 3345, Spanish for Business and Economics; 3355, Advanced Conversation through Cultural Issues in Film; 3360, Spanish Civilization; 3365, Film and Recent Cultural Trends in Spain; 4340, History of the Spanish Language; 4345, The Languages of Spain; 4400, The Origins of Spanish Literature; 4405, Literature of the Spanish Golden Age; 4410, Spanish Literature from the Enlightenment to 1900; 4415, Spanish Literature from 1900 to the Present; 4440, Development of the Short Story; 4445, Development of

the Novel; 4450, The Contemporary Novel; 4455, Development of Drama; 4465, Theory and Practice of Drama; 4470, Development of Lyric Poetry; 4475, Contemporary Lyric Poetry; 4620, Love and Honor in Medieval and Golden Age Literature; 4640, *Don Quixote*; 4670, Spanish Realism; 4690, Alterity and Migration in Spain.

WOMEN'S AND GENDER STUDIES: 1272, Feminism and Film.

Course descriptions begin on page 178.

French and Italian

CHAIR Meike Werner

DIRECTOR OF UNDERGRADUATE STUDIES IN FRENCH

Raisa Rexer

DIRECTOR OF UNDERGRADUATE STUDIES IN ITALIAN

Andrea Mirabile

DIRECTOR OF GRADUATE STUDIES Nathalie Debrauwere-Miller

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PRINCIPAL SENIOR LECTURERS Nathalie Dieu-Porter, Susan Kevra

SENIOR LECTURER EMERITUS Tracy Barrett

SENIOR LECTURERS Daniela D'Eugenio, Elyse B. Petit

LECTURER Rebecca Peterson

THE Department of French and Italian offers a wide range of courses in the language, culture, and literatures of Italy, France, and other Francophone communities. Most language, literature, and culture courses are taught in French or Italian. Students may use courses in both French and Italian to satisfy some requirements of AXLE.

The department offers a program of concentration in French as well as two interdisciplinary programs: a concentration in French and European studies and a concentration in Italian and European studies. Qualified French majors may also participate in the Honors Program in French. Minors in French and Italian are offered. On the graduate level, the department offers a doctoral program in French.

Many students participate in French or Italian study abroad programs. The department offers Maymester programs in France and Italy. On-campus activities include films, symposia, concerts, and lectures by visiting professors. The department has chapters of national honor societies for both French and Italian students. Students may also apply to live on the French Hall in McTyeire International House.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in French

Students who choose to major in French are expected to achieve advanced proficiency in oral and written French and to demonstrate a general understanding of the history of French and Francophone literatures and cultures. No more than 6 credit hours of AP or IB credit may count toward the 30 credit hours required

for the major (3 credit hours for 2501W and 3 credit hours of "no equivalent" credit). All majors are strongly urged to spend a semester or a year studying abroad. Majors should consult their advisers about their choice of major courses each semester.

Course work for the major is distributed as follows:

Required courses (9 credit hours): 2501W, 3101, 3102

Two courses from Communications (6 credit hours): 2611, 2614, 2891, 3111, 3112, 3113

Five courses from Literatures and Cultures (15 credit hours):

2332, 3185W, 3222, 3224, 3230, 3232, 3233, 3234, 3620, 3621, 3634, 3730, 3880, 3881, 3891, 3892, 4023, 4027, 4029, 4232, 4234, 4320, 4430, 4432.

Honors Program in French

In addition to requirements set by the College of Arts and Science, the following requirements must be met:

1. All the requirements for the 30-credit-hour major in French.
2. One graduate-level French course during the senior year for at least 3 credit hours; this course may substitute for one 3000- or 4000-level course required for the major.
3. Earn a 3.5 grade point average in courses that count toward the French major.
4. Six credit hours of thesis credit under French 4998 and 4999 (Senior Honors Thesis), culminating in a written thesis.
5. An oral examination on the thesis and its area in the last semester of the senior year.

A three-member Honors Committee will administer the program. Students must submit the name of the faculty adviser and the proposed thesis topic to this committee for approval during the second semester of the junior year. The committee will set guidelines for the thesis topic proposal, publish deadlines each year, and administer the oral examination.

Program of Concentration in French and European Studies

Students may elect this interdisciplinary major, which requires a minimum of 30 credit hours of course work. A semester of study at a French study abroad program is strongly encouraged. Course work for the joint major is distributed as follows:

French (24 credit hours)

French Language, Literature, and Culture (9 credit hours):

2501W, 3101, 3102

Communications (3 credit hours): 2611, 2614, 2891, 3111, 3112, or 3113

Literatures and Cultures (6 credit hours): 2332, 3185W, 3224, 3230, 3232, 3234, 3620, 3621, 3634, 3730, 3880 and 3881, 3891, 4023, 4027, 4029, 4232, 4234, 4320, 4430, 4432.

European Studies (12 credit hours)

European Studies core courses (3 credit hours): EUS 2201, 2203

Courses in EUS or alternative topical courses as approved by major adviser (6 credit hours)

Minor in French

The minor in French requires 18 credit hours of 2000- or higher-level course work, including 2501W, 3101, and 3102. All minors are expected to consult their advisers about their choice of courses. No course taught in English may count

toward the minor. Students are encouraged to participate in a French study abroad program.

Minor in Italian Studies

Students who minor in Italian studies are expected to achieve intermediate proficiency in oral and written Italian, to demonstrate a general understanding of the history of Italian literatures and cultures, and to develop an awareness of the ways Italian studies intersects with other disciplines. The minor in Italian studies requires 15 credit hours of course work, including:

Required courses (6 credit hours):

ITALIAN: 2203, Intermediate Italian (prerequisite ITA 1102; ITA 1103, or equivalent); either 2501W, Grammar and Composition (prerequisite ITA 2203 or equivalent), or 2614, Conversation (prerequisite ITA 2203 or equivalent). ITA 1101, 1102, 1103 do not count toward the minor.

Elective courses (9 credit hours). Only 3 of these elective credit hours may be selected from courses in subject areas other than Italian, such as Classical Studies, History, History of Art, Music Literature, and History:

ITALIAN: 2501W, Grammar and Composition (if not used as a required course); 2614, Conversation (if not used as a required course); 3000, Introduction to Italian Literature; 3041, Italian Civilization; 3100, Literature from the Middle Ages to the Renaissance; 3240, Dante's *Divine Comedy*; 3340, *Famous Women* by Boccaccio; 3500, Baroque, Illuminismo, and Romanticism in Italy; 3600, Twentieth-Century Literature: Beauty and Chaos; 3640, Classic Italian Cinema; 3641, Contemporary Italian Cinema; 3701, City Fictions; 3702, Topics in Contemporary Italian Civilization; 3703, The Cultural and Linguistic Worlds of Italy; 3740, Gangsters, Lovers, Madonnas, and Mistresses; 3802, Contemporary Italian Society and Culture; 3890, Special Topics in Italian Literature.

CLASSICAL STUDIES: LAT 3100, Roman Comedy; LAT 3110, Catullus; LAT 3120, Lucretius: *De Rerum Natura*; LAT 3130, Vergil: *The Aeneid*; LAT 3160, Ovid.

HISTORY: 2220, Medieval and Renaissance Italy, 1000–1700.

HISTORY OF ART: 2310, Italian Art to 1500; 2330, Italian Renaissance Art after 1500; 3320, 3320W, Early Renaissance Florence; 3332, Raphael and the Renaissance; 3334, 3334W, Michelangelo's Life and Works.

MUSIC LITERATURE: 3220, Opera in the 17th and 18th Centuries; 3221, Opera in the 19th Century.

Other Italy-related courses not listed here—such as those in study abroad programs—may be approved towards the minor upon approval by the director of undergraduate studies in Italian. Students are encouraged to participate in study abroad programs in Italy.

Program of Concentration in Italian and European Studies

The joint major in Italian and European Studies acknowledges the cultural, political, and strategic importance of Italy within the community of European nations. It requires 30 credit hours of course work; a semester of study in Italy is recommended. Prospective majors should consult with the director of undergraduate studies in Italian and with the director of the European Studies program. Course work for the joint major is distributed as follows:

Italian (18 credit hours)

Italian language and literature — 12 credit hours from the following courses: ITA 2501W, 3000, 3041, 3240, or appropriate substitute in consultation with the adviser in Italian

Electives in Italian Studies (6 credit hours): ITA 2614, 3100, 3600, 3702, or 3640 or any other course approved by the major adviser in Italian

European Studies (12 credit hours)

European Studies core courses (3 credit hours): EUS 2201, 2203, and 4960

EUS thesis seminar (EUS 4960 Senior Tutorial) or equivalent course in Italian (3 credit hours)

Courses in EUS or alternative topical courses as approved by major adviser (6 credit hours)

Licensure for Teaching

Candidates for teacher licensure in French at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

French

Students who have not studied French in high school should begin their studies at Vanderbilt in French 1101. Students with high school French on their records must present a College Board achievement test score in French to be placed correctly. Students should consult their advisers or the Department of French and Italian for advice on placement.

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 178.

Italian

Students with high school Italian on their records should consult the director of undergraduate studies in Italian for advice on placement. Students who have not studied Italian in high school should begin their studies at Vanderbilt in Italian 1101.

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 196.

German, Russian and East European Studies

CHAIR Lutz Koepnick

DIRECTOR OF UNDERGRADUATE STUDIES IN GERMAN

James McFarland

DIRECTOR OF UNDERGRADUATE STUDIES IN RUSSIAN

Bradley Gorski

DIRECTOR OF GRADUATE STUDIES Meike G. Werner

PROFESSORS EMERITI Konstantin V. Kustanovich, John A. McCarthy,

Richard Porter, Peggy Setje-Eilers

PROFESSORS Celia Applegate, David Blackburn, Joy Calico, Jennifer

Fay, Barbara Hahn, Joel Harrington, Lutz Koepnick, Helmut Smith,

David Wood

ASSOCIATE PROFESSORS Emily Greble, Alexander Joskowicz (Jewish

Studies), James McFarland, Allison Schachter (Jewish Studies),

Frank Wcislo, Meike G. Werner, Christoph Zeller

ASSISTANT PROFESSORS Bradley Gorski, Karen Ng

MELLON ASSISTANT PROFESSOR Irina Denischenko

RESEARCH ASSISTANT PROFESSOR Wout Cornelissen

SENIOR LECTURERS Silke Schade, Denis Zhernokleyev

LECTURER David Matthew Johnson

THE Department of German, Russian and East European Studies offers a broad array of courses taught in German, Russian, or English on a wide variety of topics related to these languages, cultures, histories, and societies. For students who want to engage with German, Russian, or East European culture in a more substantive way, the department offers programs of concentration in German and in Russian.

The department sponsors lectures on topics related to German, Russian and East European society and culture, films, symposia, and other German- and Russian-themed activities. Students are encouraged to apply for living space in McTyeire International House in the German and Russian sections, and German majors with sufficient academic qualifications are invited to join Delta Phi Alpha, the national German honor society.

Many students majoring in German enroll in study abroad programs in Germany or Austria, and/or the Vanderbilt in Berlin Program in conjunction with the Free University in Berlin. Less formal activities, such as a weekly Kaffeestunde or the Stammtisch at a local pizza parlor, are also open to undergraduates. For further information, please see as.vanderbilt.edu/grees.

The Russian program has a special commitment to undergraduate training in all aspects of Russian culture and language. Thus, students are able to pursue their particular interests within the Russian program while simultaneously being held to a measurable standard. For further information, please see as.vanderbilt.edu/grees.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in German Studies

Students majoring in German demonstrate advanced proficiency in oral and written German, as well as detailed understanding of significant aspects of German-speaking cultures, histories, and societies. Students are required to complete a total of 30 credit hours of course work beyond GER 1102, including the following:

- Core courses:
3 credit hours in 2440, 2441, or 2443 3
- German language in context:
12 credit hours of 2201, 2202, 3201, 3202W 12
- Electives in German culture and history taught in German:
at least 9 credit hours of any course in German between 4551–4558 9
- Electives in German culture and history taught in English:
at least 6 credit hours of courses taught in English above 2443 6

Total credit hours: 30

Students are permitted to count a maximum of 6 credit hours of instruction in courses outside the GER subject area toward the major, with the approval of the director of undergraduate studies in German; such course work will count toward the 6 credit hour total for elective courses in German culture and history taught in English. Up to 6 credit hours earned through AP exams or transferred from other institutions may count toward the major.

German Language Proficiency

In addition, students majoring in German will be tested for language proficiency during their junior year and will be required to submit a paper written for one of their courses due the semester prior to graduation. The director of undergraduate studies in German should be consulted for details on these special learning outcome assessments.

Honors Program in German Studies

Candidates for honors in German who meet College of Arts and Science and departmental requirements must complete all requirements for the concentration in German. In addition, students

- must study a minimum of one semester at a German-speaking university (or gain the equivalent experience);
- complete 3 credit hours beyond the basic course requirements, in the form of a course taught in German above GER 4550;
- maintain at least a 3.30 cumulative GPA in courses that count toward the German major and a 3.30 cumulative GPA;
- complete 3 credit hours of 4999. Write an honors thesis and pass an oral examination during their final semester.

Minor in German Studies

A minor in German documents a student's basic competence in the German language as well as familiarity with German-speaking culture. Students can fulfill the requirements of a minor concentration in German by taking GER 2440, 2441, or 2443 and 15 credit hours in the GER subject area, of which 6 credit hours must be earned in courses taught in the German language, for a total of 18 credit hours.

Study Abroad

Students majoring in German studies are strongly encouraged to complete an immersive German-language experience in a

German-speaking country. Further information is available through the director of undergraduate studies and the Global Education Office.

Goethe-Institut Certificate in Business German

Students completing GER 4558: Business German may take an examination at a Goethe-Institut to obtain the *Bulats Deutsch-Test für den Beruf*, a certificate in business German recognized by businesses worldwide. Further information is available on the Goethe-Institut website: goethe.de/en/spr/kup/prf/prf/bul.html.

Program of Concentration in German and European Studies

Students pursuing the interdisciplinary major in German and European studies combine their focus on German language and literature with a study of modern Europe in its political, economic, and cultural diversity. The German and European studies joint major consists of a minimum of 30 credit hours of course work. A semester of study abroad in a German-speaking country is recommended. Course work for the major is distributed as follows:

German (15 credit hours)

- Language courses (6 credit hours): GER 3201 and 3202W
- Great German Works or History of German Thought (3 credit hours): GER 2440 or 2441
- German culture in English (3 credit hours); any course between GER 2551–2557, or appropriate substitute approved by the director of undergraduate studies in German
- German culture (3 credit hours): any course between GER 4551–4558

European Studies (15 credit hours)

- European Studies core courses (3 credit hours): EUS 2201 or 2203)
- European Studies courses or alternative topical courses as approved by major adviser (9 credit hours)
- Senior Tutorial (3 credit hours); EUS 4960 or equivalent course in German

Program of Concentration in Russian Studies

Students majoring in Russian studies demonstrate advanced proficiency in oral and written Russian, as well as serious engagement with Russian culture, society, and history in its national and regional contexts. Students are required to complete a minimum of 30 credit hours of course work. AP and IB exam credit will not count toward credit hours required for the concentration, but placement exams will be offered for RUSS 1101 and/or 1102. A maximum of 6 credit hours toward the language or elective requirements may be earned from Vanderbilt-approved courses taken from other U.S. institutions or through study abroad programs.

Core course

- RUSS 1500 3 credit hours

Language courses in Russian

- RUSS 1102 [prerequisite 1101] 4 credit hours
- RUSS 2201–2202 8 credit hours

- Two courses in Russian above RUSS 3000 6 credit hours

Elective courses

9 credit hours minimum

The 9 credit hours of elective credit may be earned from RUSS courses in Russian above 3000, or in English-language courses with the RUSS subject code (see the list of qualifying courses below). Students concentrating in Russian will be expected to take an assessment exam prior to graduation.

Study Abroad

Students majoring in Russian studies are strongly encouraged to complete an immersive Russian-language experience in the Russian Federation or another Russian-speaking country. Further information is available through the director of undergraduate studies and the Global Education Office.

Honors Program

Majors with a cumulative GPA of 3.30 or higher may apply to the Honors Program prior to registration of second semester junior year. They will submit a 6 credit hour program of study that couples a RUSS-designated course above 2202 in the first semester senior year with RUSS 4999, Senior Honors Thesis, in the second semester of the senior year. This program must have the approval of the departmental faculty member who will serve as the senior thesis adviser. The senior thesis is defended in the second semester of the senior year before a faculty committee, which may award Honors or High Honors in Russian to the baccalaureate degree.

Minor in Russian Studies

Requirements for a minor in Russian studies include a minimum of 17 credit hours of course work. Required courses are RUSS 1101–1102 and one English-language course with the RUSS subject code (3 credit hours; see the list of qualifying courses below). The remaining 6 credit hours may be earned either from Russian- and English-language courses with the RUSS subject code (see the list of qualifying courses below) or from other relevant courses with approval of the director of undergraduate studies. A maximum of 6 credit hours toward the Russian minor may be earned from Vanderbilt-approved courses taken from other U.S. institutions or through study abroad programs. AP and IB exam credit will not count toward credit hours required for the minor, but placement exams will be offered for RUSS 1101 and/or 1102.

Russian- and English-language courses with the RUSS subject code that qualify for the elective credit hours required for the concentration and minor in Russian:

1874, 1910W, 1911W, 2201–2202 [minor only], 2210, 2230, 2273, 2434, 2435, 2438, 2485, 2537, 2639, 2745, 2800, 2810, 2910, all 3000-level courses, and 4999.

Program of Concentration in European Studies: Russia and Eastern Europe

Students pursuing the interdisciplinary European Studies major in Russia and Eastern Europe combine their focus on Russian and East European societies with a study of modern Europe in its political, economic, and cultural diversity. Students may elect this interdisciplinary major consisting of 29 credit hours of course work. A semester of study abroad in Russia or Eastern and Central Europe is recommended.

Course work for the major is distributed as follows

Russian and East European Studies (17 credit hours)

- 8 credit hours in Russian language: either RUSS 1101–1102 (8 credit hours), or equivalent in another East European language, or RUSS 2201–2202 (8 credit hours), or equivalent in another East European language. Other East European languages include Albanian, Bulgarian, Czech, Croatian/Bosnian/Serbian, Hungarian, Romani, Romanian, Polish, Slovak, or Yiddish.
- 9 credit hours of topical courses on Russia or Eastern Europe in RUSS or as approved by the major adviser

European Studies (12 credit hours)

- EUS 2201, European Society and Culture (3 credit hours) or EUS 2203, The Idea of Europe (3 credit hours)
- 6 credit hours of courses in EUS or alternative topical courses as approved by the major adviser
- EUS 4960, Senior Tutorial (3 credit hours) or equivalent 3 credit hour course in RUSS

Licensure for Teaching

Candidates for teacher licensure in German at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

German

Students with some experience in German should consult the department for placement.

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 180.

Russian

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 223.

Hebrew

DIRECTOR OF UNDERGRADUATE STUDIES Adam Meyer
ASSISTANT PROFESSOR Mazalit Haim

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 182.

History

CHAIR Edward Wright-Rios
VICE CHAIR Michael Bess
DIRECTOR OF UNDERGRADUATE STUDIES Lauren Clay
DIRECTOR OF UNDERGRADUATE STUDIES FOR LAW, HISTORY, AND SOCIETY Lauren Clay
DIRECTOR OF GRADUATE STUDIES Samira Sheikh
PROFESSORS EMERITI Richard J. M. Blackett, David Lee Carlton, Paul K. Conkin, James A. Epstein, Jimmie L. Franklin, Matthew Ramsey, V. Jacque Voegeli, Donald L. Winters
PROFESSORS Celia Applegate, Lauren Benton, Michael D. Bess, David Blackbourn, William Caferro, William Collins, Jefferson Cowie, Katherine B. Crawford, Dennis C. Dickerson, Marshall C. Eakin, Gerald Figal, Joel F. Harrington, Yoshi Igarashi, Sarah Igo, Peter Lake, Jane Gilmer Landers, Thomas McGinn, Moses Ochonou, David Price, Thomas Alan Schwartz, Helmut Walser Smith, Arleen M. Tuchman, Daniel H. Usner Jr., David Wasserstein, Rhonda Y. Williams, Edward Wright-Rios
ASSOCIATE PROFESSORS Celso Castilho, Lauren Clay, Emily Greble, Leor Halevi, Paul A. Kramer, Peter Lorge, Catherine Molineux, Ruth Rogaski, Samira Sheikh, Francis W. Wcislo
ASSISTANT PROFESSORS Ari Bryen, Brandon Byrd, Sara E. Mayeux, Ole Molvig, Tasha Rijke-Epstein, Frank Robinson, Kimberly Welch
RESEARCH ASSISTANT PROFESSORS Jordan Downs, Michael Questier
SENIOR LECTURER Yollette T. Jones

MORE than one hundred courses in the Department of History are available to Vanderbilt undergraduates. Some focus on a particular historical period, others on a particular region of the world, and still others on topics that may cross traditional chronological and geographical boundaries. The department is committed to the principle that in a changing world, the way we learn about the past must also change. It will continue to develop new courses for the twenty-first century, with an emphasis on those that recognize the interconnections among the various civilizations and regions of the globe.

Unless indicated otherwise in the course description, history courses have no prerequisite. Except for History 3980, 4960, 4980–4981, and 4999, courses numbered below 5000 are open to all majors and nonmajors. History 4960 is limited to seniors and juniors who have previously taken History 3000W. History 3980, 4980–4981, and 4999 are limited to students who have been admitted to the History Honors Program.

Students will find that the study of history offers not only a strong foundation for a liberal education but also a means of understanding the contemporary world. The skills developed in gathering, assessing, and synthesizing information have wide application in many careers, including business and the professions.

The Department of History offers a major and minor in history; a major in law, history, and society; and, in cooperation with the Department of Economics, a joint major in economics and history, which is described in this catalog under Economics and History.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in History

The major program requires a minimum of 30 credit hours in history; no more than 3 credit hours of AP or IB credit may count toward this total. *Note:* AP and IB credit will not count toward the 15 credit hours for the concentration.

Course work is distributed as follows:

1. 3000W or 3980 (3 credit hours)

Note: 3000W or 3980 is a prerequisite for the 4960 capstone course. 3980 is limited to second-semester juniors who have been admitted to the Honors Program. Students entering the Honors Program who have already taken 3000W will receive elective credit for that course.

2. Five courses in one of the following concentrations (15 credit hours):

- A. Asia
- B. Latin America
- C. Europe
- D. Early America and the United States
- E. Middle East and Africa
- F. Global and Transnational
- G. Science, Medicine, and Technology
- H. Comparative History/Special Topics

See below for a list of courses that count for Concentrations A, B, C, D, E, F, and G. Students choosing concentration H must have the approval of their adviser and the director of undergraduate studies for a specific program of study. First-Year Writing Seminars (1111) in history may be used to satisfy the relevant program concentration with approval of the director of undergraduate studies.

Program A. Asia

1038, 1039, 1050, 1060, 1070, 1080, 1085W, 1090, 1160, 1161, 1200, 1881, 1882W, 2100, 2105, 2110, 2111, 2115, 2119, 2120, 2140, 2145, 2150, 2160, 2180, 2658, 3090, 3110, 3112W, 3190, 3220, 3230, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, 4999; ASIA 2411, 2413, 2511, 2630; MHS 2310.

Program B. Latin America

1038, 1039, 1368, 1370, 1378, 1379W, 1380, 1383, 1385W, 1469, 1650, 2450, 2457, 2470, 2480, 2490, 2510, 2530, 2535, 2540, 2542, 2570, 2845, 3100, 3230, 3280, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; AADS 4256.

Program C. Europe

1038, 1039, 1040W, 1200, 1345, 1350, 1352, 1355W, 1360, 1470, 1480, 1500, 1510, 1510L, 1520, 1580, 1582W, 1584W, 1586W, 1600, 1695W, 1700, 1725W, 1760, 2130, 2135, 2140, 2160, 2170, 2190, 2220, 2230,

2237, 2238, 2240, 2250, 2255, 2260, 2270, 2280, 2290, 2293, 2294, 2300, 2310, 2340, 2380, 2382, 2383, 2385, 2410, 2450, 2595W, 2658, 2660, 2720, 2760, 2760W, 2800, 2835, 2840, 3010, 3050, 3070W, 3100, 3110, 3120, 3150, 3180, 3190, 3210, 3230, 3240, 3260, 3270, 3275, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; CLAS 2100, 2110, 2120, 2150, 2160, 2180, 3110; ECON 3160; EUS 2201, 2208, 2220; GER 2442, 2554, 2563; JS 1111.09, 1220, 1240, 2450, 2540, 3100, 3210; PHIL 2100; RLST 2250W, 3316, 3350, 4371; RUSS 2800, 2810, 2820, 2910, 2915.

Program D. Early America and the United States

1038, 1039, 1200, 1383, 1385W, 1390, 1395, 1400, 1410, 1420, 1422W, 1427W, 1430W, 1438, 1440, 1469, 1480, 1500, 1520, 1640, 1650, 1660, 1665, 1667, 1690, 1691, 1693, 1699, 1710W, 1725W, 1730, 1740, 1770, 1780W, 2111, 2119, 2239, 2240, 2530, 2535, 2542, 2580, 2590, 2595W, 2600, 2610, 2620, 2630, 2640, 2650, 2655, 2660, 2662, 2684, 2685, 2686, 2689, 2690, 2691, 2692W, 2700, 2710, 2720, 2721, 2722, 2725, 2730, 2735, 2740, 2749, 2750, 2752, 2760, 2780, 2800, 2810, 2840, 2845, 2855, 2860, 3010, 3112, 3030, 3040, 3045W, 3050, 3070W, 3100, 3110, 3140, 3170, 3190, 3230, 3240, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; AADS 2214; AMER 1700W; ECON 2150, 3150; HOD 1115; JS 1240, 2540, 2560; MHS 2110.

Program E. Middle East and Africa

1038, 1039, 1161, 1190, 1200, 1269, 1270, 1270W, 1271W, 1280, 1281W, 1725W, 2137, 2138, 2139, 2140, 2154, 2155, 2160, 2170, 2180, 2190, 2413, 2413W, 2510, 2660, 3150, 3190, 3200, 3209, 3210, 3230, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 4960, 4980–4981, and 4999; AADS 2106; CLAS 2180, 3010; JS 1111.09, 1200, 1220, 1240, 2540, 2600, 2620, 3210; RLST 4371.

Program F. Global and Transnational

1038, 1039, 1040W, 1190, 1200, 1270, 1270W, 1271W, 1280, 1345, 1368, 1370, 1378, 1379W, 1380, 1383, 1385W, 1469, 1470, 1600, 1650, 1665, 1691, 1692, 1695W, 1700, 1725W, 1740, 1881, 2106, 2110, 2130, 2135, 2137, 2138, 2139, 2140, 2150, 2160, 2170, 2180, 2190, 2238, 2294, 2413, 2413W, 2450, 2457, 2480, 2490, 2530, 2535, 2540, 2542, 2570, 2595W, 2658, 2660, 2700, 2710, 2721, 2722, 2725, 2735, 2740, 2760, 2760W, 2835, 2840, 2845, 3010, 3100, 3110, 3112W, 3120, 3150, 3190, 3209, 3220, 3230, 3240, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; ASIA 2413, 2630; CLAS 2120, 2180, 3010, 3110; JS 1200, 1220, 1240, 2450, 2540, 2845, 3000, 3100; EUS 2220; MHS 2110; RLST 3306, 4371; RUSS 2810, 2820, 2910, 2915.

Program G. Science, Medicine, and Technology

Students may meet the requirement by taking five courses from the SMT list, among which not more than two may be courses outside the Department of History.

1385W, 1470, 1480, 1500, 1510, 1510L, 1520, 1780W, 2139, 2160, 2413W, 2780, 2800, 2810, 3040, 3045W, 3050, 3070W, 3110, 3230, and, as appropriate, 3746, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; ANTH 4373; ASIA 2630; ASTR 2130; ENGL 3720 or 3720W; MATH 3000; MHS 2110, 2310, 2320, 2430; and other courses, as appropriate, with approval of the director of undergraduate studies.

3. Capstone course (3–6 credit hours)

One of the following, to be taken in the junior or senior year; all of the options will require the student to write a major paper. Any capstone course within the student's area of concentration will count toward the five-course requirement for that concentration.

Option 1: 3883, Internship Research (3 credit hours). Must be taken in conjunction with 3880 (internship training). Prerequisite: 3000W. *Note:* a student may take 3883 as an elective before completing 3000W but in this case 3883 will not count as a capstone course.

Option 2: 4960, Majors Seminar (3 credit hours). Prerequisite: 3000W.

Option 3: 4980–4981, Senior Honors Seminar (6 credit hours). Limited to seniors in the History Honors Program. *Note:* At the discretion of the director of honors and the director of undergraduate studies, a student who has taken 4980 but does not take 4981 may be considered to have fulfilled the capstone requirement for the major.

- Electives (6–12 credit hours, depending on the nature of the capstone course)

Program of Concentration in Law, History, and Society

As a human institution self-consciously aware of its past, “The Law” raises a complex set of issues that can be addressed historically. Legislation and jurisprudence, for example, allow historians a privileged perspective into how societies sought to define themselves, their values, and their membership. Constitutions provide maps of political power, and serve as sites of struggle over goods both real and symbolic. Records of legal practice are often well preserved, allowing access to the voices and actions of people who are usually left out of systems of political organization.

This major approaches law from both a historical and an interdisciplinary perspective. Emphasis will be placed on close reading of legal documents, research in legal archives, and analytical writing. Students will be encouraged to develop reading programs and research topics that stretch across national and chronological boundaries, and to think comparatively. Students may not major both in history and in law, history, and society. Students majoring in law, history, and society may apply to receive honors through the History Honors Program.

The major program requires a minimum of 30 credit hours in history; no more than 3 credit hours of AP or IB credit may count toward this total. *Note:* AP and IB credit will not count toward the 15 credit hours for the concentration. No more than 6 credit hours may be from courses outside the Department of History.

Course work is distributed as follows:

- History Workshop. 3000W or 3980 (3 credit hours)
Note: 3000W is a prerequisite for the 4960 capstone course. 3980 is limited to second-semester juniors who have been admitted to the Honors Program. Students entering the Honors Program who have already taken 3000W will receive elective credit for that course.
- Law, History, and Society: Five courses from the following: 1040W, 1271W, 1345, 1352, 1379W, 1383, 1385W, 1430W, 1580, 1584W, 1667, 2130, 2135, 2155, 2190, 2237, 2238, 2239, 2240, 2290, 2293, 2294, 2450, 2580, 2590, 2610, 2658, 2662, 2690, 2691, 2692W, 2760, 2760W, 2855, 2860, 3170, 3209 and, as appropriate, 3850, 3882, 3883, 3890, 3980, 4960, 4980–4981, and 4999; CLAS 3150, 3160; CMST 3150; ECON 4210; ENGL 3734; FREN 4232; JS 2150; MHS 2320; PSCI 1103, 2208, 2226, 2251, 2262, 2265, 2266, 3260; RUSS 2485, 2810, 2820, 2910, 2915; SOC 3605, 3611, 3613, 3621; 3624; WGS 3271, 3281; and other courses, as appropriate, with approval of the director of undergraduate studies of Law, History, and Society.

Note: First-Year Writing Seminars (1111) in history may be used to satisfy the relevant program concentration with approval of the director of undergraduate studies of Law, History, and Society.

- Capstone course (3–6 credit hours)

One of the following, to be taken in the junior or senior year; all of the options will require the student to write a major paper, the topic of which must be approved by the director of undergraduate studies of law, history, and society. Any capstone course on a topic concerning law, history, and society will count toward the five-course requirement for the program concentration.

Option 1: 3883, Internship Research (3 credit hours). Must be taken in conjunction with 3880 (internship training). Prerequisite: 3000W. *Note:* a student may take 3883 as an elective before completing 3000W but in this case 3883 will not count as a capstone course.

Option 2: 4960, Majors Seminar (3 credit hours). Prerequisite: 3000W.

Option 3: 4980–4981, Senior Honors Seminar (6 credit hours). Limited to seniors enrolled in the History Honors Program.

Note: At the discretion of the director of honors and the director of undergraduate studies in law, history, and society, a student who has taken 4980 but does not take 4981 may be considered to have fulfilled the capstone requirement for the major.

- Electives (6–12 credit hours in history, depending on the nature of the capstone course)
Electives may include any courses, not used to satisfy any of the above requirements, offered by the Department of History or listed above in major requirement #2.

Honors Program

The Honors Program in History is a three-semester program of study. It offers superior undergraduate history majors a program of advanced reading, research, and writing. The Honors Program combines seminar work and independent study under the supervision of a thesis adviser. This structure provides participants an introduction to historical research and writing, as well as the opportunity to study defined areas of history and significant historical problems that accord with their own interests. The final objectives of the Honors Program are successful authorship of the honors thesis and graduation with honors or highest honors in the major.

Students apply to the Honors Program in the first semester of the junior year. Students meeting college and departmental requirements will enroll for a total of 12 credit hours: History 3980, Junior Honors Seminar in History (3 credit hours); History 4980–4981 Senior Honors Research Seminar (6 credit hours); and 4999, Senior Honors Thesis (3 credit hours). In addition, the Honors Program requires an oral defense of the honors thesis before a faculty committee at the end of the third semester.

Program of Concentration in Economics and History

This is an interdisciplinary program split between economics and history that provides a more focused program of study while requiring fewer credit hours than a double major in the two fields. See the Economics and History section of this catalog for details.

Licensure for Teaching

Candidates for teacher licensure in history at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Minor in History

The minor in history requires a minimum of 18 credit hours in courses that are offered by the Department of History or that are listed above in programs A–G of the history major, among which no more than two courses may be outside the Department of History. At least 9 credit hours must be taken at the 2000 level or higher. Students must complete 3000W. No more than 3 credit hours of AP or IB credit may count toward this total.

Course descriptions begin on page 183.

History of Art

CHAIR Kevin D. Murphy
 DIRECTOR OF UNDERGRADUATE STUDIES Sheri Shaneyfelt
 DIRECTOR OF GRADUATE STUDIES Betsey A. Robinson
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 Milan Mihal, Robert L. Mode, Ljubica D. Popovich
 PROFESSORS Leonard Folgarait, Vivien Green Fryd, Christopher M. S.
 Johns, Kevin D. Murphy, David Price
 ASSOCIATE PROFESSORS Tracy Miller, Elizabeth J. Moody, Betsey A.
 Robinson
 ASSISTANT PROFESSORS Mireille M. Lee, Rebecca K. VanDiver
 MELLON ASSISTANT PROFESSOR Heeryoon Shin
 ASSISTANT PROFESSOR OF THE PRACTICE Matthew Worsnick
 PRINCIPAL SENIOR LECTURER Sheri Shaneyfelt
 SENIOR LECTURER Anna Guengerich

THE Department of History of Art treats critically the major fields in world art, from ancient to contemporary, and serves to connect the arts to the other humanities. Many students will use the program in history of art as a foundation for careers in which analytical reading and writing skills gained in the major are especially valued: as the basis for advanced training in professional schools (such as architecture, law, medicine, journalism, and business), for postgraduate work in history of art, and for employment in galleries, museums, or design-related fields. A major goal of the department is to help students become readers of visual images and material culture throughout their lives, as well as to encourage visual approaches to learning.

Majors in history of art participate in the activities of the Vanderbilt History of Art Society and work closely with departmental advisers. The History of Art Society and the department sponsor events such as panels, lectures, debates, and other programs where majors meet and engage in discussions with historians of art and museum curators.

The department curriculum complements those of related departments and programs, including African American and Diaspora Studies, American Studies, Asian Studies, Cinema and Media Arts, Classical and Mediterranean Studies, European Studies, Latin American Studies, Religious Studies, and Women's and Gender Studies.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration

The history of art major requires 30 credit hours and gives students the opportunity to study art and visual culture across a wide range of historical periods, from ancient to contemporary. The program is designed to allow for concentration in particular periods and areas of interest. By requiring courses in both the lecture and seminar format, the program aims to provide a basis of comprehensive knowledge and challenging opportunities for more specialized instruction.

Students should consider related offerings in cognate disciplines in the humanities and social sciences. Those planning graduate work in history of art should pursue advanced studies—which may include honors—and take advanced courses in other departments offering complementary course work. Advanced language studies are strongly recommended, as graduate programs expect reading facility in one language for the M.A. and two for the Ph.D., with French and German the most commonly required. Non-European languages should be considered for those primarily interested in non-Western traditions.

Requirements for the Program of Concentration

A 1000-level course (3 credit hours): Students must complete one 1000-level survey course in history of art or architecture selected from HART 1100, 1105, 1120 or 1121, 1200, 1205, 1220, 1300, or 1400. This course is not a prerequisite for further history of art course work but must be taken at Vanderbilt; AP and transfer credit will not be accepted.

Area requirements (15 credit hours)—five history of art courses at the 2000 level or above, one each from the following areas:

- Ancient:* HART 2210, 2220, 3224, 3226, 3228W, 3240W, 3252; CLAS 2250, 3200
- Medieval:* HART 2270, 2275, 2285, 2288, 2290, 3364W
- Renaissance/Baroque:* HART 2310, 2320W, 2325, 2330, 2362, 2390, 3320, 3320W, 3332, 3334, 3334W
- Modern:* HART 2600, 2620, 2622, 2625, 2650, 2660, 2665, 2710, 2720, 2722, 2740, 2750, 2755, 2760, 2765, 3605W, 3712W, 3718W, 3725W, 3740, 3757W, 3766W, 3767W
- Non-Western:* HART 2100, 2110, 2120, 2130, 2150, 2170, 2175, 2180, 2192, 3112, 3140, 3164W, 3173W, 3174

Electives (6 credit hours)—two upper-level courses in history of art (HART 2100 to 3850 and 3890; CLAS 2250, 3200, 3720) in addition to the area requirements.

Advanced Seminars (6 credit hours)—HART 3000W, 4960

Honors Program

The Honors Program in History of Art allows exceptional undergraduate students to undertake independent research on a topic in art history in consultation with faculty members. The program is open to all history of art majors with junior standing who meet a 3.30 grade point average in all university courses and a 3.30 grade point average in history of art courses. They must also be approved for acceptance into the honors program by the department faculty. Completion of the program requires 9 credit hours of study: HART 3850, Independent Research (the second semester of the junior year,

unless studying abroad, in which case one is expected to enroll in this class the first semester of the junior year); HART 4998, Honors Research (first semester of the senior year); and HART 4999, Honors Thesis (second semester of the senior year); submission of an honors thesis; and successful completion of an oral defense of the thesis. These independent research-credit hours are expected to be in addition to the 30 credit hours required for the major in history of art. Students meeting these requirements receive honors or highest honors in history of art, depending on the quality of the thesis, grades in history of art courses, and defense results. Successful departmental honors students will receive a Vanderbilt diploma that records honors or highest honors in history of art.

Minor in History of Art

The minor in history of art requires 18 credit hours of course work, including the following:

Two 1000-level courses from 1100, 1105, 1120 or 1121, 1200, 1205, 1220, 1300, or 1400, plus any four upper-level history of art courses (HART 2100 to 3850 and 3890, 4960), and classes designated CLAS 2250, 3200, 3720.

Minor in History of Architecture

The minor in history of architecture requires 18 credit hours of course work, including the following:

Two 1000-level courses from 1100, 1105, 1120 or 1121, 1200, 1205, 1220, 1300, or 1400, plus four upper-level history of art courses selected from HART 2100, 2110, 2120, 2130, 2150, 2175, 2180, 2210, 2220, 2270, 2275, 2285, 2290, 2650, 2665, 2720, 2722, 2740, 2780, 2782, 2815, 3112, 3140, 3174, 3240W, 3252, 3725W, 3757W, 3766W, 3790, and CLAS 2250, 3200, 3720.

Course descriptions begin on page 191.

Honors

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

COURSES designated “Honors” are parts of a special honors program in liberal education. They may be taken only by students who have been appointed College Scholars by the dean of the College of Arts and Science. Some College Scholars are appointed before they arrive for their first semester in residence; others may be appointed on the basis of their records in that first semester. All first-year students in the College of Arts and Science may apply to the associate dean for honors programs for admission to the College Scholars program; only first-year students are considered for admission.

Honors seminars offered in the College Scholars program provide an especially interesting and challenging way for College Scholars to complete certain parts of the program for Achieving Excellence in Liberal Education (AXLE). They are designed to cover topics through the intensive analysis afforded by the seminar setting and format. An honors seminar will satisfy the requirement for a first-year writing seminar. Honors

1810W, 1820W, 1830W, 1840W, 1850W, and 1860W count toward the AXLE requirements identified by the seminars’ titles. Honors 1810W challenges students to examine their personal understanding of life and how their individual experiences overlap with those of the rest of human kind. Honors 1820W gives significant attention to individual and cultural diversity, multicultural interactions, sexual orientation, gender, racial, ethical, religious, and “Science and Society” issues. Honors 1830W studies human behavior at the levels of individuals, their interactions with others, their societal structures, and their social institutions. Honors 1840W provides students with a basis for understanding the American experience and the shaping of American values and viewpoints within the context of an increasingly global society. Honors 1850W emphasizes quantitative reasoning and prepares students to describe, manipulate, and evaluate complex or abstract ideas or arguments with precision. Honors 1860W provides a basis for understanding the diversity of experiences and values in our contemporary, global society.

In addition to regular credit hours and grade points, honors seminars carry honors points toward graduation with the designation “Honors in the College of Arts and Science.” College Scholars must earn fifteen honors points to receive that designation (they are not required to earn this designation but may take as many honors seminars as they wish). They may earn up to thirteen of the required fifteen points in honors seminars: three points each for the first time they take Honors 1810W, 1820W, 1830W, 1840W, 1850W, or 1860W; one point if they take a second seminar in the same area. Single honors points may be earned (a) in departmental honors sections of regular courses, (b) in independent study approved by the associate dean for honors programs, and (c) in a regular course in which an enriched curriculum approved by the Committee on the Honors Program is pursued. Honors points are only earned for courses in which the student earns the grade B or better.

Course descriptions begin on page 195.

Interdisciplinary Studies

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Any student who is at least a sophomore and in good academic standing may earn one credit hour per semester or summer for an internship completed under the designation INDS 3880/3884(summer) exclusively on a Pass/Fail basis. This course may be repeated twice for a maximum of three credit hours. Students are responsible for obtaining their own internship and faculty adviser. The student and faculty adviser work together to plan the academic project associated with the internship. Their agreement must be approved by Associate Dean Yollette Jones.

Course descriptions begin on page 196.

Jewish Studies

DIRECTOR Julia Phillips Cohen

ASSOCIATE DIRECTOR Adam Meyer

PROFESSORS Amy-Jill Levine, David Price, David J. Wasserstein

ASSOCIATE PROFESSORS Phillip Ackerman-Lieberman, Julia Phillips

Cohen, Ari Joskowitz, Shaul Kelner, Adam Meyer, Allison Schachter

ASSISTANT PROFESSORS Rebecca Epstein-Levi, Mazalit Haim

SENIOR LECTURER Judith Klass

JEWISH Studies at Vanderbilt offers an interdisciplinary academic program that facilitates the critical study of Jewish history, religion, language, philosophy, politics, culture, society, music, art, and literature across continents and over three millennia. Integral to understanding crucial moments in the formation of Christianity and Islam as well as distinct episodes in the cultures of the modern Middle East, Europe, and America, the program accesses the resources of the entire university to explore Judaism, its evolution and expression from biblical times to the present. This interdisciplinary program reflects Vanderbilt's commitment to advancing the understanding of diverse cultures and traditions. Students of all backgrounds will find in Jewish Studies at Vanderbilt a wide array of material and methodologies, presented by scholars from history, anthropology, sociology, religious studies, philosophy, literature, and history of art. Students may focus on several areas of concentration and tailor the major to their academic and career interests. They also have access to courses offered by the schools of divinity, education, and music; they have access to the Zimmerman Judaica collection as well as the opportunity to study abroad, pursue internships locally or nationally, and do research in archives overseas. The interdisciplinary nature of Jewish Studies offers excellent preparation for graduate studies and provides an outstanding academic foundation for a variety of rewarding career paths. Visit as.vanderbilt.edu/jewishstudies for more details.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Jewish Studies

The major in Jewish studies requires a minimum of 30 credit hours.

1. *Introductory course, 3 credit hours.* JS 1002 or 1002W, Introduction to Jewish Studies, JS 1010: Introduction to Judaism, or JS 1040: Introduction to Modern Jewish History.
2. *Language, 6 credit hours.* A year of modern Hebrew (Hebrew 2201–2202, Intermediate Hebrew) or biblical Hebrew (REL 5120, Intermediate Hebrew).^{*} Proficiency at the level of intermediate Hebrew can be demonstrated through testing. If this option is exercised, students will take an additional 6 credit hours of electives toward the major. ^{*}In place of biblical or modern Hebrew, interested students may substitute one of the following languages of the Jewish people: Rabbinic Hebrew, Aramaic, Yiddish, Ladino, or Judaeo-Arabic. For languages not presently taught at Vanderbilt, proficiency at the intermediate level may be demonstrated through an exam administered by a designated member of the Jewish Studies faculty. If this option is exercised, students will take an additional 6 credit hours of electives toward the major.

3. *Electives (minimum of 21 credit hours)*—Any of the courses listed below that are not used to fulfill another requirement towards the major may be counted as an elective with the exception of JS 3880, which cannot count toward the major because it must be taken Pass/Fail. In addition to courses drawn from Arts and Science departments and the professional schools, nontraditional course work may also be selected, including archaeology at Tel Megiddo (Israel), service learning, and internships. Study abroad is encouraged and can be fulfilled with CET Jewish Studies in Prague and at the Hebrew University of Jerusalem.

Honors Program

The Honors Program in Jewish Studies offers superior students a more intensive concentration within their major field. Admission to the program requires:

1. A 3.3 cumulative grade point average.
2. A 3.3 cumulative grade point average in Jewish Studies.
3. Completion of the junior year.

Requirements for graduation with honors in Jewish Studies are:

1. 6 credit hours in Honors sections (JS 4980–4981), including completion of thesis—these credit hours may count as elective credit toward the major. Honors thesis is to be completed by mid-spring of the senior year.
2. Successful completion of an honors oral examination on the topic of the thesis.

Minor in Jewish Studies

The minor in Jewish studies provides a basic understanding of Jewish history and culture across continents and the past three millennia. The minor requires a minimum of 18 credit hours.

1. *Introductory course, 3 credit hours.* JS 1002 or 1002W, Introduction to Jewish Studies. JS 1010: Introduction to Judaism, or JS 1040: Introduction to Modern Jewish History.
2. *Electives (minimum of 15 credit hours).* Any of the courses listed below that are not used to fulfill another requirement toward the minor may be counted as an elective. Special Topics courses or First-Year Writing Seminar courses dealing with topics related to Jewish studies may be counted with the approval of the program director.

LANGUAGE:

Jewish Studies: 4301, Jewish Language and Paleography.

Hebrew (Modern Hebrew): 1101–1102, Elementary Hebrew; 2201–2202, Intermediate Hebrew; 2301, Advanced Hebrew Grammar; 2302W, Advanced Hebrew Composition; 3851–3852; Independent Study in Modern Hebrew.

ELECTIVES:

Jewish Studies: 1002 or 1002W, Introduction to Jewish Studies; 1010, Introduction to Judaism, or 1040, Introduction to Modern Jewish History; 1111.01, In a Pluralistic Age: Jews, Christians, and Muslims in Spain; 1111.02, Music and Identity in Jewish Traditions; 1111.03, Radical Jews from Karl Marx to Noam Chomsky; 1111.04, Civil Rights and Civil Wrongs: Black–Jewish Relations in the 1950s and 1960s; 1111.05, Gender, Sexuality, and Desire in Jewish Literature; 1111.06, Reading across the Boundaries: Arab and Israeli Literature and Culture; 1111.07, From Einstein to Chomsky: Revolutionary Sciences in Jewish America; 1111.09, Jews and Muslims: A Modern History; 1111.10, Jewish Response to Catastrophe;

1111.12, Jews and Hollywood; 1200, Classical Judaism: Jews in Antiquity; 1220, Jews in the Medieval World; 2100, The New Testament in Its Jewish Contexts; 2150, Issues in Rabbinic Literature; 2210W, Hebrew Literature in Translation; 2220, Israeli Culture Through Film; 2230W, American Southern Jews in Life and Literature; 2240W, Black–Jewish Relations in Post-War American Literature and Culture; 2250W, Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors; 2260, Coming of Age in Jewish Literature and Film; 2260W, Coming of Age in Jewish Literature and Film; 2270, Jewish Storytelling; 2270W, Jewish Storytelling; 2280, Jewish Humor; 2280W, Jewish Humor; 2290W, Imagining the Alien: Jewish Science Fiction; 2300, Modern Jewish Thought; 2320, Freud and Jewish Identity; 2330, Is G–d Guilty? The Problem of Evil in Judaism; 2340, Jewish Philosophy after Auschwitz; 2400, American Jewish Life; 2420W, American Jewish Music; 2450, The Jewish Diaspora; 2500, Modern Israel; 2520, Zionism: Politics, Religion, and Ethnicity; 2540, Power and Diplomacy in the Modern Middle East; 2560, Social Movements in Modern Jewish Life; 2600, Islam and the Jews; 2620, Jews in Egypt; 2640, Jews and Greeks; 3000, Major Themes in Jewish Studies; 3100, The Holocaust; 3210, Reading across Boundaries: Jewish and Non-Jewish Texts; 3830, Contemporary Jewish Issues; 3883, Internship Research; 3890, Special Topics; 3892, Topics in Ancient and Medieval Jewish History; 3894, Topics in Modern Jewish History; 4301, Jewish Language and Paleography; 4960, Senior Seminar; 4970, Senior Project in Jewish Studies.

Anthropology: 3140, Myth, Ritual, Belief: The Anthropology of Religion.

Classics: 2100, History of the Ancient Near East; 2120, Greece and the Near East from Alexander to Theodosius; 2160, History of Roman Empire; 3010, The Ancient Origins of Religious Conflict in the Middle East.

English: 3370, The Bible in Literature; 3664, Jewish American Literature.

European Studies: 2208, Conspiracy Theories and Rumors in European and U.S. History.

French: 4430, Jews and Arab Muslims in France.

German: 1111, Representing the Holocaust; 2443, German Cinema: Vampires, Victims, and Vamps; 2445, Nazi Cinema: The Manipulation of Mass Culture; 3344, Women at the Margins: German Jewish Women Writers; 4574, Who Am I? German Autobiographies.

History: 1111.18, The Life, Science, and Times of Albert Einstein; 1190, A History of Islam; 1200, The Arab Spring; 2155, Muhammad and Early Islam; 2160, Medicine in Islam; 2170, Islam and the Crusades; 2190, Last Empire of Islam; 2280, Europe, 1900–1945; 2290, Europe since 1945; 2300, Twentieth-Century Germany; 2720, World War II; 3150, Cities of Europe and the Middle East; 3190, Religion, Culture, and Commerce: The World Economy in Historical Perspective; 3210, Muslims, Christians, and Jews in Medieval Spain.

History of Art: 2260, The Art of Pagans, Christians, and Jews; 2765, Art since 1945.

Music Literature: 2150, Music, Identity, and Diversity; 2310, The Bible and Music.

Philosophy: 2101, Hellenistic and Late Ancient Philosophy; 2102, Medieval Philosophy; 2103, Modern Philosophy; 2109, Twentieth-Century Continental Philosophy; 3005, Jewish Philosophy; 3006, Islamic Philosophy; 3011, Critical Theory; 3607, Philosophy of Religion; 3657, Humanity, Evolution, and God.

Political Science: 2230, Middle East Politics; 2263, Religion and Politics; 3235, Political Islam.

Religion: 6511, Book of Genesis.

Religious Studies: 1111, First-Year Writing Seminar; 1200, Introduction to Judaism; 1208, Themes in the Hebrew Bible; 1500, Introduction to Islam; HUM1610, The Golden Age of Islam; 2210W, Constructions of Jewish Identity in the Modern World; 2220, Jewish Ethics; 2940, Great Books of Literature and Religion; 3225, Sexuality in the Hebrew Bible and the Ancient Near East; 3229, The Holocaust: Its Meanings and Implications; 3270, Jewish Theories of Religion; 3926, Ancient Goddesses; 3930, Women and Religion;

3940, The Nature of Evil; 3941, Religion, Science, and Evolution; 4552, Islam in the Modern World; 4834, Post-Freudian Theories and Religion; 4837, Psychology of Religious Myth and Ritual; 4938, Marriage in the Ancient Near East and the Hebrew Bible; 4939, Religious Autobiography.

Russian: 2434, The Russian Cinema.

Sociology: 3204, Tourism, Culture, and Place; 3222, Sociology of Religion; 3702, Racial and Ethnic Minorities in the United States.

Course descriptions begin on page 197.

Latin American Studies

DIRECTOR Edward F. Fischer
EXECUTIVE DIRECTOR Avery Dickins de Girón
ASSISTANT DIRECTOR, DIRECTOR OF UNDERGRADUATE STUDIES,
AND DIRECTOR OF GRADUATE STUDIES Nicolette Kostiw
LATIN AMERICAN BIBLIOGRAPHER Paula Covington

Affiliated Faculty

PROFESSORS Robert Barsky (French and Italian), John Brock (Medicine), Maria Magdalena Campos-Pons (Art), Daniel B. Cornfield (Sociology), Arthur A. Demarest (Anthropology), Tom D. Dillehay (Anthropology), Marshall Eakin (History), David J. Ernst (Physics), Edward F. Fischer (Anthropology), Earl E. Fitz (Portuguese), Leonard Folgarait (History of Art), Edward H. Friedman (Spanish), Lesley Gill (Anthropology), Guilherme Gualda (Earth and Environmental Sciences), Ruth Hill (Spanish), David J. Hess (Sociology), Vera Kutzinski (English), Jane G. Landers (History), Lorraine Lopez (English), William Luis (Spanish), Terry A. Maroney (Law), Peter Martin (Medicine), Philip D. Rasico (Spanish), Fernando Segovia (Divinity), Timothy Sterling (Medicine), Randall S. Thomas (Law), Benigno Trigo (Spanish), Bart Victor (Management), Edward Wright-Rios (History), Andrés Zamora (Spanish), Elizabeth J. Zechmeister (Political Science), Mel Ziegler (Art)
ASSOCIATE PROFESSORS Dominique P. Béhague (Medicine, Health, and Society), Victoria A. Burrus (Spanish and Portuguese), Janey Camp (Engineering), José Cárdenas Bunsen (Spanish), Celso T. Castilho (History), Beth A. Conklin (Anthropology), Markus Eberl (Anthropology), Quentin Eichbaum (Medicine), Carol Etherington (Nursing), William R. Fowler Jr. (Anthropology), Carlos Grijalva (Medicine), Jana Harper (Art), T. S. Harvey (Anthropology), Jonathan Hiskey (Political Science), Suzana Herculano-Houzel (Psychology), John Janusek (Anthropology), Christina Karageorgou-Bastea (Spanish), Noam Lupu (Political Science), Paul B. Miller (French and Latin American Studies), Troy Moon (Medicine), Douglas Morgan (Medicine), Ifeoma Nwankwo (English), Emanuelle Oliveira-Monte (Portuguese), Cynthia Paschal (Engineering), Tiffany Patterson (African American and Diaspora Studies), Vesna Pavlovic (Art), Norbert O. Ross (Anthropology), Mariano Sana (Sociology), Mavis Schorn (Nursing), José Sibaja (Music), Jada Benn Torres (Anthropology), Tiffany A. Tung (Anthropology), Steven A. Wernke (Anthropology), Gilman W. Whiting (African American and Diaspora Studies)
ASSISTANT PROFESSORS Candice Amich (English), Molly Barth (Music), Adriana Bialostozky (Medicine), Carwil Bjork-James (Anthropology), Corey E. Brady (Education), Brandon Byrd (History), Kathryn L. Carlson (Medicine), Ashley Carse (Education), Jessica Castilho (Medicine), Ana Christina da Silva Iddings (Education), Neerav Desai (Medicine), Andrew Dustan (Economics), Jesus Gomez-Velez (Engineering), Federico Gutierrez (Economics), Brian L. Heuser (Education), Maria Luisa Jorge (Earth and Environmental Sciences), Natasha McClure (Nursing), Marzia Milazzo (English), W. Frank Robinson (History), Pedro Sant'Anna (Economics), Brent Savoie (Medicine), Carlos Silvera Batista (Engineering), Susan G. Stewart (Astronomy), Sarah V. Suiter (Education), Lori Troxel (Engineering), Julie Vernon (Engineering), Thomas E. Verrier (Music), Carol Ziegler (Nursing)

SENIOR LECTURERS Frances Alpren (Spanish), Ana Regina Andrade (Economics), Jose Aznar (Spanish), Joe Bandy (Sociology), Lorraine Catanzaro (Spanish), Rachel Chiguluri (Spanish), Paula Covington (Latin American Studies), Sarah Delassus (Spanish), Avery Dickins de Girón (Latin American Studies), Heraldo Falconí (Spanish), Victoria Gardner (Spanish), Chalene Helmuth (Spanish), Clint Hendrix (Spanish), Nicolette Kostiw (Latin American Studies), Benjamin Legg (Portuguese), Alicia Lorenzo (Spanish), Ryan Middagh (Music), Spring Miller (Law), Patrick Murphy (Spanish), Michael Newton (Law), Amarilis Ortiz (Spanish), David A. Owens (Management), Carolina Palacios (Spanish), Maria Paz Pintane (Spanish), Shelza Rivas (Nursing), Mareike Sattler (Anthropology), Cynthia Wasick (Spanish)

DESIGNATED by the U.S. Department of Education as a National Resource Center for Latin America, Vanderbilt's Center for Latin American Studies draws on departmental strengths and faculty expertise from across campus. Integrating teaching, research, and service, the center maintains substantive collaborations with all of Vanderbilt's colleges and schools. The center has special strengths in Maya studies, Brazilian studies, Andean studies, and the Black Atlantic, as well as unique library collections of Colombiana. Programs of instruction provided by the center promote greater understanding of the region's history, culture, political economy, and social organization and cultivate the ability to think strategically about global issues.

Faculty and courses come from the Departments of Anthropology, Economics, History, History of Art, Political Science, Sociology, and Spanish and Portuguese as well as from Vanderbilt's education, engineering, law, management, medical, music, and nursing schools. The center fosters a lively research community on campus by sponsoring colloquia, conferences, films, and a speaker series that brings distinguished scholars, government and business leaders, and social activists to campus.

For undergraduates, the Program in Latin American Studies offers an interdisciplinary undergraduate major and a minor in Latin American studies, as well as a minor in Brazilian studies. The program also offers summer opportunities in Brazil and Guatemala, and facilitates study abroad and service learning opportunities in Latin American countries. An honors program is available.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Latin American Studies

The major in Latin American studies consists of 36 credit hours plus a language requirement.

I. Language requirement	demonstrated proficiency
II. Core courses	6 credit hours
III. Distribution requirements	12 credit hours
IV. Area of concentration	12 credit hours
V. Electives	6 credit hours

Note: No course may be counted twice in calculating the 36 credit hours. Upon approval of the Committee on Individual Programs and the student's adviser, (a) as many as 6 credit hours may be counted as part of both the interdisciplinary major and a second major, or (b) normally, no more than three introductory-level courses will be counted toward the interdisciplinary major.

I. Language Requirement. A student must acquire advanced knowledge of one Latin American language (Spanish, Portuguese, or an indigenous language) and an intermediate knowledge in another Latin American language. The requirement to acquire advanced knowledge of a Latin American language may be satisfied by completing Spanish 3303, or any course with a higher number taught in Spanish, or any course with a higher number taught in Portuguese. The requirement to acquire intermediate knowledge of another Latin American language may be satisfied by successfully completing Spanish 2203, Portuguese 2203, or K'iche' 1101 (formerly Anthropology 2612) Elementary K'iche' I. Individual standardized testing may also be used to demonstrate knowledge.

II. Core Courses (6 credit hours)

LAS 2101, Introduction to Latin America
LAS 4901, Research Seminar

III. Distribution Requirements (12 credit hours). Two relevant classes in two of the following three areas not chosen as the major area of concentration.

- A) History
- B) Language, Literature, and Art History (Departments of Spanish & Portuguese and History of Art)
- C) Social Sciences (Departments of Anthropology, Economics, Political Science, Sociology).

IV. Area of Concentration (12 credit hours from one of the following areas; special topics and independent study courses must be approved for sufficient LAS content by major adviser):

A. History.

HISTORY: 1370, Colonial Latin America; 1378, Social Movements in Latin America, 1780–1912; 1379W, The Inquisition in the New World; 1380, Modern Latin America; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2470, Modern Mexico; 2480, Central America; 2490, Brazilian Civilization; 2510, Reform and Revolution in Latin America; 2530, African Religions in the Americas; 2535, Latin America and the United States; 2540, Race and Nation in Latin America; 2570, Caribbean History, 1492–1983; 3280, Popular Cultures in Modern Latin America; 3850, Independent Study; 3890, Selected Topics in History.

LATIN AMERICAN STUDIES: 2102, Brazil: Past, Present, and Future.

B. Language, Literature, History of Art.

AFRICAN AMERICAN AND DIASPORA STUDIES: 1706, Capoeira: Afro-Brazilian Race, Culture, and Expression; 2148, Blacks in Latin America and the Caribbean; 2356, African Spirits in Exile: Diaspora Religions in the Americas; 3248, Atlantic African Slave Trade.

CREOLE: 1101, Elementary Creole I; 1102, Elementary Creole II; 2201, Intermediate Creole I; 2202, Intermediate Creole II.

HISTORY OF ART: 3718W, Twentieth-Century Mexican Art: Painting, Cinema, Literature; 3850, Independent Research; 4960, Advanced Seminar.

K'ICHE': 1101, Elementary K'iche' I; 1102, Elementary K'iche' II; 2201, Intermediate K'iche' I; 2202, Intermediate K'iche' II.

LATIN AMERICAN STUDIES: 2102, Brazil: Past, Present, and Future; 2301, Music of Protest and Social Change in Latin America; 4550, Gender, Sexuality, and Family in Latin America.

PORTUGUESE: 1103, Intensive Elementary Portuguese; 2203, Intermediate Portuguese; 3301, Portuguese Composition and Conversation; 3302, Brazilian Pop Culture; 3303, Introduction to Luso-Brazilian Literature;

3850, Independent Study; 3892, Special Topics in Portuguese Language, Literature, or Civilization; 4350, Brazilian Culture through Native Material; 4420, Brazilian Literature through the Nineteenth Century; 4425, Modern Brazilian Literature.

SPANISH: 2203, Intermediate Spanish; 2995, Contemporary Latin American Prose Fiction in English Translation; 3303, Introduction to Spanish and Spanish American Literature; 3320, Introduction to Hispanic Cultural Studies; 3330, Cultural Studies in the Andes; 3340, Advanced Conversation; 3345, Spanish for Business and Economics; 3350, Spanish for the Legal Profession; 3355, Advanced Conversation through Cultural Issues in Film; 3360, Spanish Civilization; 3375, Film and Culture in Latin America; 3830, Spanish for the Medical Profession; 3835, Latino Immigration Experience; 3850, Independent Study; 3891, Special Topics in Hispanic Culture; 3892, Special Topics in Spanish Language and Linguistics; 3893, Special Topics in Hispanic Literature; 4310, Translation and Interpretation; 4325, Dialectology; 4340, History of the Spanish Language; 4400, The Origins of Spanish Literature; 4405, Literature of the Spanish Golden Age; 4415, Spanish Literature from 1900 to the Present; 4420, Spanish American Literature from the Conquest to 1900; 4425, Spanish American Literature from 1900 to the Present; 4440, Development of the Short Story; 4445, Development of the Novel; 4450, The Contemporary Novel; 4455, Development of Drama; 4465, The Theory and Practice of Drama; 4470, Development of Lyric Poetry; 4620, Love and Honor in Medieval and Golden Age Literature; 4640, *Don Quixote*; 4720, Literary Genres and National Identities in Latin America; 4725, Jungle Narratives in Latin America; 4730, Modern Latin American Poetry; 4750, Afro-Hispanic Literature; 4755, Latina and Latin American Women Writers; 4760, Literature and Medicine; 4810, Images of the City.

C. Social and Natural Sciences.

ANTHROPOLOGY: 2105, Race in the Americas; 2106, Culture and Power in Latin America; 2108, Indigenous Peoples of Lowland South America; 2110, Gender and Cultural Politics; 2227, Food in the Ancient World; 2231, Ancient Andean Civilizations; 2603, Comparative Writing Systems; 3122, The Anthropology of Globalization; 3130, Andean Culture and Society; 3133, Political Anthropology; 3134, Human Rights of Indigenous Peoples; 3140, Myth, Ritual, Belief: The Anthropology of Religion; 3141, Anthropology of Healing; 3143, Medical Anthropology; 3161, Colonial Encounters in the Americas; 3200, Ancient Cities; 3202, The Collapse of Civilizations; 3240, Ancient Mesoamerican Civilizations; 3241, The Aztecs; 3242, The Archaeology of the Ancient Maya Civilization; 3243, Classic Maya Religion and Politics; 3250, The Inca Empire; 3850–3851, Independent Research; 3890, Special Topics.

ECONOMICS: 2220, Latin American Development; 3600, International Trade; 3650, Development Economics; 3851–3852, Independent Study in Economics; 4520W, Seminar on Globalization.

Note: Students who successfully complete an Economics course on this list numbered 4520W or higher may also receive Area of Concentration credit for successfully completing either Economics 3010 or 3020.

MEDICINE, HEALTH, AND SOCIETY: 2410, HIV/AIDS in the Global Community; 3210, Health, Development, and Culture in Guatemala; 3212, Health, Development, and Culture in Guatemala.

POLITICAL SCIENCE: 2213, Democratization and Political Development; 2219, Politics of Mexico; 2225, International Political Economy; 3217, Latin American Politics; 3219, La política de América Latina; 3228, International Politics of Latin America; 3897, Selected Topics; 3851–3852, Independent Research.

SOCIOLOGY: 3232, Contemporary Mexican Society; 3321, Population and Society; 3322, Immigration in America; 3851, Independent Research and Writing.

V. Electives (6 credit hours). Any two classes listed above (or others approved by the major adviser).

Honors Program

An honors program is available, acceptance into which must be approved by the director of undergraduate studies. Students must have a minimum 3.3 cumulative GPA and a 3.3 GPA in courses that count toward the Latin American studies major to be accepted into the program. The Honors Program requires: completion of 6 credit hours in LAS 3851 and 3852; the writing of an honors thesis; and passing an oral honors examination. Interested students should consult their academic adviser during their junior year.

Minor in Latin American Studies

Students must complete 15 credit hours of approved courses with Latin American content including Latin American Studies 2101. In addition, students must demonstrate intermediate knowledge of one Latin American language by successfully completing Spanish 2203, Portuguese 2203, or K'iche' 2201. Courses taken to satisfy the language requirement may not be counted toward the 15 credit hours of core courses. Individual standardized testing may also be used to demonstrate knowledge.

Course selection must be approved by the undergraduate adviser of the Program in Latin American Studies.

Minor in Brazilian Studies

The Program in Latin American Studies also offers a minor in Brazilian studies. Students must complete 15 credit hours of approved courses with Brazilian content including LAS 2102 and Portuguese 2203. In addition, students must complete three additional courses from the Areas of Study listed below: one course in Area I, one course in Area II, and one course in Area III. Proficiency at the level of intermediate Portuguese can be demonstrated through testing. If this option is exercised, students must take 3 credit hours of course work approved by the director of undergraduate studies in lieu of the 3 credit hours of PORT 2203.

Course selection must be approved by the director of undergraduate studies for Latin American Studies. Other elective courses, including special topics courses, may be counted toward the minor with the approval of the director of undergraduate studies.

Requirements for completion of the minor include at least 15 credit hours as follows:

1. 3 credit hours of LAS 2102: Brazil: Past, Present, and Future
2. 3 credit hours of PORT 2203: Intermediate Portuguese (PORT 1103 is a prerequisite)
3. 3 credit hours from Area I: Portuguese Language and Literature
4. 3 credit hours from Area II: Brazilian Society, History, and Cultures
5. 3 credit hours from Area III: Brazil in Regional and Global Context

Areas of Study

Area of Study I: Portuguese Language and Literature

PORTUGUESE: 3301, Portuguese Composition and Conversation; 3303, Introduction to Luso-Brazilian Literature; 4420, Brazilian Literature through the Nineteenth Century; 4425, Modern Brazilian Literature.

Area of Study II: Brazilian Society, History, and Cultures

ANTHROPOLOGY: 2108, Indigenous Peoples of Lowland South America.

HISTORY: 2490, Brazilian Civilization.

PORTUGUESE: 3302, Brazilian Pop Culture; 4350, Brazilian Culture through Native Material; 3891, Special Topics in Portuguese and Brazilian Literature or Civilization in English Translation.

Area of Study III: Brazil in Regional and Global Context

AFRICAN AMERICAN AND DIASPORA STUDIES: 2148, Blacks in Latin America and the Caribbean; 3248, Atlantic African Slave Trade; 1706, Capoeira: Afro-Brazilian Race, Culture, and Expression.

ANTHROPOLOGY: 2106, Culture and Power in Latin America.

ECONOMICS: 2220, Latin American Development.

HISTORY: 1370, Colonial Latin America; 1380, Modern Latin America; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2510, Reform and Revolution in Latin America; 2540, Race and Nation in Latin America.

POLITICAL SCIENCE: 3217, Latin American Politics; 3228, International Politics of Latin America.

SOCIOLOGY: 3231, Contemporary Latin America.

Course descriptions begin on page 200.

Latino and Latina Studies

DIRECTOR Gretchen Selcke

LATINO and Latina Studies focuses on cultural production and political and socioeconomic experiences of people inculcated with the U.S. experience, self-identifying as Latinos and Latinas and communicating primarily in English and sometimes in Spanish. The LATS major and minor will examine this enduring and dynamic population that crosses and re-crosses borders constructed by geography, linguistics, class, race, and gender. This program of study is designed to accommodate a range of voices and multiple manifestations of Latino and Latina identity and cultural expression in historical and contemporary contexts to fill in this vital but often overlooked component of our national identity and discourse.

Students pursuing a LATS major or minor are expected to obtain language competence in Spanish before completing the program, though they do not need to meet this requirement when declaring the major or minor. Students may satisfy this requirement by completing SPAN 3303, or any other course with a higher number taught in Spanish.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Latino and Latina Studies

The interdisciplinary major in Latino and Latina studies consists of thirty-six (36) credit hours. The specific requirements are as follows:

1. LATS 2201, Introduction to Latino and Latina Studies (3 credit hours)

2. SPAN 3303, Introduction to Spanish and Spanish American Literature (3 credit hours)
SPAN 3303 requires up to 19 prerequisite credit hours of Spanish language instruction through SPAN 3302, depending on departmental placement.
3. ENGL 3658, Latino-American Literature (3 credit hours)
4. LATS 4961, Latino and Latina Studies Seminar, which is usually taken in the senior year (3 credit hours)
5. Eight elective courses (24 credit hours) with at least two courses from Group A (Latino and Latina Culture) and two courses from Group B (Historical Context), that have not already been applied to satisfy above requirements.

Minor in Latino and Latina Studies

Students pursuing the interdisciplinary minor must complete eighteen (18) credit hours. The specific requirements are as follows:

1. LATS 2201, Introduction to Latino and Latina Studies (3 credit hours)
2. SPAN 3303 or ENGL 3658 (3 credit hours)
If both courses are taken, only one may be applied as elective credit.
3. LATS 4961, Latino and Latina Studies Seminar (3 credit hours)
4. Three other courses (9 credit hours), with at least one course from Group A (Latino and Latina Culture) and one course from Group B (Historical Context), that have not already been applied to satisfy above requirements.

Approved List of Courses

Category A: Latino and Latina Culture

ENGLISH: 1111-19 FYWS, Growing Up Latino and Latina; 3658, Latino-American Literature.

HISTORY: 2725, Race, Power, and Modernity.

HUMAN AND ORGANIZATIONAL DEVELOPMENT: 2510, Health Service Delivery to Diverse Populations.

LATINO AND LATINA STUDIES: 3831, Latino and Latina Business and Entrepreneurship; 3850, Independent Study.

SOCIOLOGY: 3702, Racial and Ethnic Minorities in the United States; 3322, Immigration in America.

SPANISH: 3302, Spanish for Oral Communication Through Cultural Topics; 3303, Introduction to Spanish and Spanish American Literature; 3345, Spanish for Business and Economics; 3830, Spanish for the Medical Profession; 4310, The Contemporary Novel; 3835, Latino Immigration Experience; 4750, Afro-Hispanic Literature; 4755, Latina and Latin American Women Writers.

Category B: Historical Context

AFRICAN AMERICAN AND DIASPORA STUDIES: 3178, Colonialism and After.

ANTHROPOLOGY: 2106, Culture and Power in Latin America; 2220/2220W, Human Landscapes; 3160, Anthropologies and Archaeologies of Community; 3161, Colonial Encounters in the Americas; 3202, The Collapse of Civilizations; 3240, Ancient Mesoamerican Civilizations; 3241, The Aztecs;

3242, The Archaeology of the Ancient Maya Civilization; 3243, Classic Maya Religion and Politics; 3250, The Inca Empire.

ENGLISH: 3654, African American Literature; 3674, Caribbean Literature.

HISTORY: 1380, Modern Latin America; 1383, Slave Resistance in the Americas; 1385W, Disease and Disorder in the Atlantic World; 2450, Reform, Crisis, and Independence in Latin America, 1700–1820; 2457, Drug Trafficking and Society in Latin America; 2480, Central America; 2510, Reform and Revolution in Latin America; 2570, Caribbean History, 1492–1983; 2580, American Indian History before 1850; 2590, American Indian History since 1850.

LATIN AMERICAN STUDIES: 2101, Introduction to Latin America; 2301, Music of Protest and Social Change in Latin America; 3891, Special Topics in Latin American Studies; 4550, Gender, Sexuality, and Family in Latin America.

MUSIC LITERATURE: 2110, Music in Latin America and the Caribbean.

SOCIOLOGY: 3231, Contemporary Latin America; 3602, Change and Social Movements in the Sixties.

SPANISH: 3365, Film and Recent Cultural Trends in Spain; 3892, Special Topics in Spanish Language and Linguistics; 4450, The Contemporary Novel; 4465, The Theory and Practice of Drama; 4740, Spanish-American Literature of the Boom Era; 4760, Literature and Medicine.

Category C: Critical Perspectives

AFRICAN AMERICAN AND DIASPORA STUDIES: 1010, Introduction to African American and Diaspora Studies.

ANTHROPOLOGY: 3134, Human Rights of Indigenous Peoples.

ENGLISH: 3742, Feminist Theory.

PHILOSOPHY: 3617, Philosophy of Language.

POLITICAL SCIENCE: 2208, Law, Politics, and Justice; 2219, Politics of Mexico; 3217, Latin American Politics; 3228, International Politics of Latin America; 3264W, Global Feminisms.

SOCIOLOGY: 3312, Environment and Development; 3232, Contemporary Mexican Society; 3314, Environmental Inequality and Justice; 3612, Class, Status, and Power; 3701, Racial Domination, Racial Progress; 3704, Race, Gender, and Sport.

WOMEN'S AND GENDER STUDIES: 1150/1150W, Sex and Gender in Everyday Life; 3201, Women and Gender in Transnational Context.

Course descriptions begin on page 201.

Managerial Studies

DIRECTOR Joseph J. Rando
 PROFESSOR OF THE PRACTICE Gary R. Kimball
 ASSOCIATE PROFESSORS OF THE PRACTICE Willis J. Hulings,
 Michael K. Lawson, Patrick R. Leddin, Joseph J. Rando,
 Garnett H. Slatton, Brent E. Trentham
 ADJUNCT ASSOCIATE PROFESSOR Janet M. McDonald
 LECTURERS Douglas D. Edwards, Jamie P. Leddin

THE College of Arts and Science offers two minors in the liberal arts tradition to help students understand management functions, corporate strategy, and financial economics. These two minors are administered by the Managerial Studies program. Each of the minors has a distinct focus with basis in economics and accounting. Due to an institutional review

of the university's undergraduate course offerings in business, first-year students entering in the fall of 2016 or later may not declare the minors in Managerial Studies.

The program is directed by Professor Gary R. Kimball, 215 Calhoun Hall, (615) 322-4021.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Minor in Managerial Studies: Corporate Strategy

The minor in corporate strategy requires 18 credit hours.

The following courses are required:

FNEC 1600 Financial Accounting
 MGRL 1100 Fundamentals of Management
 MGRL 3250 Corporate Strategy

Three elective courses to be chosen from:

MGRL 1200 Principles of Marketing
 MGRL 2200 Data Analysis and Presentation
 MGRL 2300 Entrepreneurship: The Business Planning Process
 MGRL 3105 Negotiation
 MGRL 3110 Business Management
 MGRL 3200 Advanced Marketing
 MGRL 3209 Creative Advertising
 MGRL 3300 Entrepreneurial Challenge
 FNEC 2600 Managerial Accounting
 FNEC 2700 Corporate Finance
 FNEC 3705 Financial Management

Minor in Managerial Studies: Financial Economics

The minor in financial economics requires 18 credit hours.

The following courses are required:

ECON 1500 Economic Statistics
 or 1510 Intensive Economic Statistics
 FNEC 1600 Financial Accounting
 FNEC 2700 Corporate Finance

Three elective courses to be chosen from:

FNEC 2600 Managerial Accounting
 FNEC 3700 Investment Analysis
 FNEC 3705 Financial Management
 FNEC 3710 Corporate Valuation
 ECON 2300 Money and Banking
 ECON 3300 Financial Instruments and Markets

Mathematics 2820, Psychology 2100, or Psychology 2110 (Peabody College) may substitute for Economics 1500. Economics majors must complete 15 hours of credit in FNEC courses to complete the financial economics minor.

Minors may be combined with any departmental or interdisciplinary major; however, the minor in managerial studies must include 15 credit hours that are being counted solely toward the minor.

Students electing a second minor in managerial studies must complete at least 12 credit hours counted solely toward the second minor.

Financial Economics

Course descriptions begin on page 178.

Managerial Studies

Course descriptions begin on page 201.

Mathematics

INTERIM CHAIR Mark N. Ellingham

VICE CHAIR Gieri Simonett

DIRECTOR OF UNDERGRADUATE STUDIES John Rafter

DIRECTOR OF GRADUATE STUDIES Alexander Powell

PROFESSORS EMERITI Philip S. Croke, Richard R. Goldberg, Matthew Gould, Robert L. Hemminger, Ettore F. Infante, Gennadi Kasparov, Richard J. Larsen, Michael D. Plummer, Eric Schechter, Daoxing Xia

PROFESSORS John F. Ahner, Akram Aldroubi, Dietmar Bisch, Emmanuele DiBenedetto, Paul H. Edelman, Mark N. Ellingham, Douglas P. Hardin, C. Bruce Hughes, Vaughan F. R. Jones, Ralph N. McKenzie, Michael L. Mihalik, Mike Nearmtu, Alexander Olshanskiy, Denis Osin, Alexander Powell, John G. Ratcliffe, Edward B. Saff, Mark V. Sapir, Larry L. Schumaker, Gieri Simonett, Constantine Tsinakis, Glenn F. Webb, Dechao Zheng

RESEARCH PROFESSORS Philip S. Croke, Stephen G. Simpson

ASSOCIATE PROFESSORS Jesse Peterson, Jared Speck, Ioana

Suvaina, Steven T. Tschantz

RESEARCH ASSOCIATE PROFESSOR Rares Rasdeaconu

ASSISTANT PROFESSORS Anna Marie Bohmann, Alexander Cameron, Marcelo Disconzi, Spencer Dowdall, Cain Edie-Michell, Matthew Haulmark, William Holmes, Wöoden Kusner, Chenyun Luo, Adam Prenosil, Larry Rolan

PRINCIPAL SENIOR LECTURERS Derek Bruff, Linda Hutchison, Pamela Pigg, John Rafter, Lori Rafter

SENIOR LECTURER EMERITA Jo Ann W. Staples

SENIOR LECTURERS Henry Chan, José Gil-Férez, Alice Mark, Jakayla Robbins

POSTDOCTORAL SCHOLARS Simon André, Angelica Babei, Mitchell Faulk, James Hateley, Jocelyne Ishak, Ivan Medri, Lauren Ruth, Ian Wagner

The Department of Mathematics offers an undergraduate major with a high degree of flexibility. A solid background in mathematics provides an excellent foundation for any quantitative discipline as well as many professions—many students go on to professional studies in law, medicine, or business.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Mathematics

Three tracks are available.

Program I (Standard Track) is intended for most mathematics majors in the College of Arts and Science, Blair School of Music, and Peabody College.

Program II (Applied Track) is intended for students in the School of Engineering who elect a second major in mathematics but is also available for other students.

Program III (Honors Track) is intended for highly qualified students who either are preparing for graduate studies in mathematics or plan to graduate with departmental honors. Students who complete this program and, in addition, complete a senior thesis will graduate with departmental honors.

Requirements for the three tracks are summarized below.

Program I (Standard Track).

At least 32 credit hours in mathematics including at least 15 credit hours taken at Vanderbilt, as follows.

1. A calculus sequence: 1300–1301–2300, 1300–1301–2310, or 1300–1301–2500–2501.
2. Linear algebra and differential equations: 2600 or 2500–2501, and 2610.
3. At least 15 additional credit hours from 2800 or above.
4. The remainder of the credit hours must be chosen from 2800 or above.

Program II (Applied Track).

At least 29 credit hours in mathematics including at least 15 credit hours taken at Vanderbilt and 6 credit hours outside the department, as follows.

1. A calculus sequence as in Program I.
2. Linear algebra and differential equations—one of the following:
 - (a) one of 2410, 2600, or 2500–2501, and one of 2420 or 2610; or
 - (b) 2400 and either 2600 or 2500–2501.
3. At least 12 additional credit hours from 2800 or above, excluding 3000.
4. The remainder of the credit hours in mathematics must be chosen from 2800 or above.
5. At least 6 credit hours of advanced, mathematically based science or engineering courses approved by the director of undergraduate studies. This requirement is automatically fulfilled by students who complete a physics major or a major in the School of Engineering.

Program III (Honors Track).

At least 38 credit hours in mathematics including at least 15 credit hours taken at Vanderbilt, as follows.

1. A calculus sequence as in Program I.
2. Linear algebra and differential equations as in Program I.
3. At least 21 additional credit hours of advanced course work,
 - (a) including four courses taken from the following three categories, at least one from each category:
 - 1) Algebra: 3300, 4300, 4301.
 - 2) Analysis: 3100, 3110, 6100, 6101.
 - 3) Topology and Geometry: 3200, 3230, 4200, 4201, 4220, 6210.
 - (b) The remainder of the 21 credit hours must be chosen from 2800 or above, excluding 4999.
4. The remainder of the credit hours must be chosen from 2800 or above.

Students who complete Program III and, in addition, fulfill the Honors requirements listed below, will graduate with departmental honors.

Students planning to teach in secondary school should contact the director of secondary education programs in the Department of Teaching and Learning at Peabody College for course recommendations.

Honors Program

The Honors Program in Mathematics is designed to afford superior students the opportunity to pursue more intensive work within their major field. The program requires:

1. Completion of all the requirements of Program III (Honors Track).

- Graduate with a minimum grade point average of 3.6 in courses that count toward the mathematics major.
- Completion of a senior thesis, typically in the second semester of the senior year. With approval of the director of undergraduate studies, the thesis may be based on research initiated or completed at another academic institution, such as during a summer REU program.
- Oral examination on the senior thesis. A committee of at least three faculty members—at least two from the Department of Mathematics, one being the thesis adviser—shall evaluate the thesis and the oral examination. Exceptional achievement on the thesis will earn highest honors.

Interested students may apply to the director of undergraduate studies for admission to the Honors Program in their junior year or the first semester of their senior year. Applicants must meet college requirements for entry to the Honors Program and must maintain a minimum grade point average of 3.6 in courses that count toward the mathematics major.

The application includes a one- to two-page proposal of the planned thesis and the signature of the faculty member who will be the thesis adviser.

The thesis must be submitted no later than two weeks before the end of classes in the semester of graduation. The oral examination will take place by the last day of classes in the semester of graduation. Highest honors will be awarded for a thesis that contains original high-quality research results in combination with an oral defense at the highest quality level.

Students may sign up for Math 4999 during one semester of their senior year. Math 4999 will not count toward the 21 credit hours requirement in Program III.

Please consult the director of undergraduate studies for details.

Minor in Mathematics

The minor in mathematics requires at least 15 credit hours in mathematics, including:

- Completion of a calculus sequence: 2300, 2310, or 2500–2501.
- Linear algebra and differential equations: as in the Program II major.
- At least 6 credit hours not used to satisfy item 2 from 2800 or above.

Completion of a single-variable calculus sequence (1300–1301) is a prerequisite for the minor, but does not count toward the credit hours of the minor.

Licensure for Teaching

Candidates for teacher licensure at the secondary level in mathematics should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Calculus

Several calculus sequences are available:

1100; 1200–1201; 1300–1301–2300; 1300–1301–2310.

The courses in these sequences cover similar material, but at different rates, and therefore overlap in content and credit. Students should not switch from one to another without approval of the department. Such switching may result in loss of credit.

Students intending to take mathematics classes beyond one year of calculus are advised to enroll in the 1300–1301–2300 sequence or in the 1300–1301–2310 sequence.

First-year students with test scores of 5 on the Calculus BC advanced placement examination, thereby earning AP credit for 1300–1301, may choose to enroll in the 2500–2501 sequence. The combination of 2500–2501 is a blend of multivariable calculus and linear algebra, with an emphasis on rigorous proofs.

Course descriptions begin on page 202.

Medicine, Health, and Society

DIRECTOR Jonathan M. Metzl
 ASSISTANT DIRECTOR JuLeigh Petty
 DIRECTOR OF UNDERGRADUATE STUDIES Dominique Behague
 DIRECTOR OF GRADUATE STUDIES JuLeigh Petty
 DIRECTOR OF ADVISING Courtney S. Peterson
 DIRECTOR OF EVALUATION JuLeigh Petty
 PROFESSORS Christopher Carpenter (Economics), Derek Griffith, Jonathan M. Metzl, Hector Myers
 ASSOCIATE PROFESSORS Dominique Béhague, Martha W. Jones, Kenneth MacLeish, Lijun Song, Laura Stark
 ASSISTANT PROFESSORS Lauren Gaydosh, Gilbert Gonzales, Aimi Hamraie, Bianca Manago, Tara McKay
 SENIOR LECTURERS Celina Callahan-Kapoor, Courtney S. Peterson, JuLeigh Petty, Danielle Picard
 WRITERS IN RESIDENCE Odie Lindsey, Caroline Williams

Affiliated Faculty

PROFESSORS Kathryn Anderson (Economics), Victor Anderson (Christian Ethics), David Aronoff (Medicine), Gregory Barz (Ethnomusicology), Michael Bess (History), James Blumstein (Health Law and Policy), Frank Boehm (Obstetrics and Gynecology), Peter Buerhaus (Nursing), C. André Christie-Mizell (Sociology), Larry Churchill (Medicine), Ellen Clayton (Pediatrics and Law), Jay Clayton (English), Charles Cobb (Molecular Physiology and Physics), Bruce Compas (Psychology and Human Development), Katherine Crawford (History), Kate Daniels (English), Dennis Dickerson (History), Edward Fisher (Anthropology), Lenn Goodman (Philosophy), Douglas Heimbürger (Medicine), Joni Hersch (Law and Economics), David Hess (Sociology), Kathleen Hoover-Dempsey (Psychology and Human Development), Sarah Igo (History), Carl Johnson (Biological Sciences), Cindy Kam (Political Science), John Lachs (Philosophy), Jane Landers (History), Jana Lauderdale (Nursing), Pat Levitt (Pharmacology), Terry A. Maroney (Law), Richard McCarty (Psychology), Melissa McPheeters (Health Policy), Timothy McNamara (Psychology), Velma McBride Murry (Human and Organizational Development), Linda Norman (Nursing), Russell Rothman (Medicine), Sharon Shields (Human and Organizational Development), John Tarpley (Surgery), Benigno Trigo (Spanish), Arleen Tuchman (History), Holly Tucker (French), Bart Victor (Organization Studies), Kip Viscusi (Law and Economics), Lynn Walker (Pediatrics and Psychology and Human Development), Kenneth Wallston (Nursing and Psychology), David W. Wright (Chemistry), Laurence Zwiebel (Biological Sciences)
 ASSOCIATE PROFESSORS Muktar Aiyu (Health Policy and Medicine), Laura Carpenter (Sociology), Beth Conklin (Anthropology), Julián F. Hillyer (Biological Sciences), Rolanda Johnson (Nursing), Melanie Lutenbacher (Nursing), Abelardo Moncayo (Health Policy), Ifeoma Nwankwo (English), Evelyn Patterson (Sociology), Scott Pearson (Surgery), Louise Rollins-Smith (Nursing), Ruth Rogaski (History), Norbert Ross (Anthropology), David Schlundt (Psychology), Phillis Sheppard (Religion), Tiffany Tung (Anthropology), Timothy J. Vogus (Management and Organization Studies)
 ASSISTANT PROFESSORS Carolyn Audet (Preventive Medicine), Ian Campbell (Clinical Medicine), Joseph B. Fanning (Medicine), Ebony

McGee (Education), Troy Moon (Pediatric Infectious Disease), Sayeh Nikpay (Health Policy), Kevin T. Seale (Biomedical Engineering)
 SENIOR LECTURERS Lorraine Catanzaro (Spanish), Nathalie Porter (French), Jamie Pope (Nursing), Elisabeth H. Sandberg (Psychology)

THE Program in Medicine, Health, and Society offers an interdisciplinary major (36 credit hours) and minor (18 credit hours) for students interested in studying health-related beliefs and practices in their social and cultural contexts. As part of the requirements of the major, students must declare and complete 12 credit hours in one of the six concentrations in Medicine, Health, and Society: global health; health behaviors and health sciences; health economics and policy; inequality, intersectionality, and health justice; medicine, humanities, and arts; or critical health studies. An honors program is available. MHS draws on a variety of fields in the social sciences and humanities—anthropology, economics, history, literature, philosophy/ethics, psychology, sociology, and religious studies. The major will be of particular interest to students preparing for careers in health-related professions as well as to students interested in examining an important part of human experience from multiple perspectives and developing a critical understanding of contemporary society. Students are encouraged to take advantage of the opportunities offered by the Center for Medicine, Health, and Society. Visit vanderbilt.edu/mhs for more details.

The program is directed by Jonathan M. Metz, Frederick B. Rentschler II Professor of Sociology and Medicine, Health, and Society.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Medicine, Health, and Society

The major requires a minimum of 36 credit hours of course work, distributed as follows:

Note: No more than 21 credit hours may be in courses designated MHS. Other than MHS, no more than 12 credit hours may be in the same subject area; A&S Psychology and Peabody Psychology are considered the same subject area for purposes of the major/minor.

1. Core Courses — Students must complete one of the following (3 credit hours):

- MHS 1920, Politics of Health
- MHS 1930, Social Dimensions of Health and Illness
- MHS 1940, Racial and Ethnic Health Disparities
- MHS 1950, Theories of the Body
- MHS 2110, American Medicine in the World
- MHS 2230, Masculinity and Men's Health

2. Concentration — Students must complete four courses not used to satisfy the core course requirement or the elective requirements in one of the following six concentrations (12 credit hours). Students must declare one of the following concentrations when they declare the major.

Note: Courses must be from at least two subject areas.

- A. Global health
- B. Health policies and economics
- C. Health behaviors and health sciences
- D. Inequality, intersectionality, and health justice
- E. Medicine, humanities, and arts
- F. Critical health studies

See below for a list of courses that count for Concentrations A, B, C, D, and E. Students choosing concentration F must propose a set of four courses (12 credit hours) that form a coherent program of study related to critical health studies and receive approval from the director of undergraduate studies.

3. Electives — Seven courses not used to satisfy the core course or concentration requirements chosen from the list of approved courses (21 credit hours).

4. Disciplinary Requirement — At least 3 credit hours from the following courses must be used to satisfy the concentration requirement or electives requirement.

- ANTH 3143, Medical Anthropology
- ANTH 3141, Anthropology of Healing
- ECON 2350, Health Care Policy
- ECON 3350, Economics of Health
- HIST 2800, Modern Medicine
- MHS 3050W, Medicine and Literature
- PHIL 1008, 1008W, Introduction to Medical Ethics
- PHIL 3608, Ethics and Medicine
- PSY 3635, Health Psychology
- SOC 3301, Society and Medicine
- SOC 3304, Race, Gender, and Health
- WGS 2240, Introduction to Women's Health

In order to graduate with a major in MHS, students must take a written exam in the second semester of their senior year. (Students who are away during the second semester of their senior year because they are studying abroad or graduating early should schedule the exam during the first semester.) The exam is not graded and no grade will appear on the student's transcript. The purpose of the exam is to ascertain the extent to which MHS majors demonstrate knowledge of the MHS curriculum.

Honors Program

The Honors Program in Medicine, Health, and Society offers superior students a more intensive concentration within their major field. Admission to the program requires:

1. A 3.3 cumulative grade point average.
2. A 3.3 cumulative grade point average in courses that count toward the Medicine, Health, and Society major.
3. An application that (a) describes the proposed topic; (b) identifies the faculty member who will serve as the thesis adviser; and (c) includes a letter of recommendation from the proposed thesis adviser.

Completion of the program requires:

1. Two semesters, 3 credit hours each semester of the senior year in MHS 4998/4999.
2. An honors thesis of approximately fifty pages that reveals an interdisciplinary perspective, submitted no later than two weeks before the first day of final exams in the second semester of the senior year, and approved by a committee of at least two faculty members (one of whom must have their primary appointment in Medicine, Health, and Society).
3. Successful completion of an oral examination focusing on the topic of the thesis.

Minor in Medicine, Health, and Society

The minor consists of a minimum of 18 credit hours of course work, distributed as follows:

Note: No more than 9 credit hours may be in the same subject area; A&S Psychology and Peabody Psychology are considered the same subject area for purposes of the major/minor.

1. Core Courses — Students must complete one of the core courses of the major (3 credit hours).
2. Concentration — Students must complete three courses in one of the following five concentrations (9 credit hours). Students must declare one of the following concentrations when they declare the minor.
 - A. Global health
 - B. Health policies and economies
 - C. Health behaviors and health sciences
 - D. Inequality, intersectionality, and health justice
 - E. Medicine, humanities, and arts
3. Electives — Two additional courses, excluding those with an asterisk, chosen from the list of approved courses. (6 credit hours)
4. Disciplinary Requirement — At least 3 credit hours from the following courses must be used to satisfy the concentration requirement or electives requirement.
 - ANTH 3143, Medical Anthropology
 - ANTH 3141, Anthropology of Healing
 - ECON 2350, Health Care Policy
 - ECON 3350, Economics of Health
 - HIST 2800, Modern Medicine
 - MHS 3050W, Medicine and Literature
 - PHIL 1008, 1008W, Introduction to Medical Ethics
 - PHIL 3608, Ethics and Medicine
 - PSY 3635, Health Psychology
 - SOC 3301, Society and Medicine
 - SOC 3304, Race, Gender, and Health
 - WGS 2240, Introduction to Women's Health

Approved Courses

(Please consult the director of undergraduate studies for approval of “as appropriate” courses in concentration areas.)

CONCENTRATION A: Global Health

AMERICAN STUDIES: 3200, Global Perspectives on the U.S.

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2113W, Food, Identity, and Culture; 3122, The Anthropology of Globalization; 3138 Global Food Politics; 3143, Medical Anthropology.

ASIAN STUDIES: 2630, Chinese Medicine.

BIOLOGICAL SCIENCES: 1111, First-Year Writing Seminar (as appropriate); 3965, Undergraduate Seminar (as appropriate).

FRENCH: 3112, Medical French in Intercultural Contexts.

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 2160, Medicine in Islam.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3200, Global Dimensions of Community Development; 3231, Introduction to Health Services.

INTERDISCIPLINARY STUDIES: 3831, Global Citizenship and Service; 3832, Global Community Service; 3833, Seminar in Global Citizenship and Service (as appropriate).

MEDICINE, HEALTH, AND SOCIETY: 2110, American Medicine and the World; 2310, Chinese Society and Medicine; 2410, HIV/AIDS in the Global Community; 2420, Economic Demography and Global Health; 2610, Global Health Crises; 2940, Race, Citizenship, and Health; 3000, Undergraduate Seminar (as appropriate); 3010, Perspectives on Global Public Health; 3110, Global Health and Social Justice; 3310, Healthcare in France and the U.S.; 3890, Special Topics (as appropriate); 4010, Psychiatry, Culture, and Globalization.

POLITICAL SCIENCE: 1111, First-Year Writing Seminar (as appropriate); 2215, Change in Developing Countries; 2236, The Politics of Global Inequality; 3893, Selected Topics in American Government (as appropriate); 3894, Selected Topics in Comparative Politics (as appropriate).

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3314, Environmental Inequality and Justice; 3321, Population and Society.

SPANISH: 3830, Spanish for the Medical Profession; 4760, Literature and Medicine.

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2267, Seminar on Gender and Violence; 3201, Women and Gender in Transnational Context.

CONCENTRATION B: Health Policies and Economies

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2109, Food Politics in America; 3144, Politics of Reproductive Health; 3890, Special Topics (as appropriate).

ECONOMICS: 1010, Principles of Macroeconomics; 1020, Principles of Microeconomics; 1111, First-Year Writing Seminar (as appropriate); 1500, Economic Statistics; 1510, Intensive Economic Statistics; 2350, Health Care Policy; 3050, Introduction to Econometrics; 3350, Economics of Health.

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 2800, Modern Medicine.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3231, Introduction to Health Services; 3241, Introduction to Health Policy; 3331, Managing Health Care Organizations; 3205, Policy Analysis Methods.

MEDICINE, HEALTH, AND SOCIETY: 1920, Politics of Health; 2120, Health Social Movements; 2250, Autism in Context; 2320, Medicine, Law, and Society; 2420, Economic Demography and Global Health; 2920, Medicine on Trial; 3000, Undergraduate Seminar (as appropriate); 3320, Introduction to U.S. Health Care Policy; 3890, Special Topics (as appropriate).

PHILOSOPHY: 1008, 1008W, Introduction to Medical Ethics; 1111, First-Year Writing Seminar (as appropriate); 3608, Ethics and Medicine.

POLITICAL SCIENCE: 1111, First-Year Writing Seminar (as appropriate); 2236, The Politics of Global Inequality; 2270, Conducting Political Research; 3893, Selected Topics in American Government (as appropriate); 3894, Selected Topics in Comparative Politics (as appropriate).

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3302, Poverty, Health, and Politics; 3314, Environmental Inequality and Justice; 4961, Seminars in Selected Topics (as appropriate).

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate).

UNIVERSITY: 3325, Health Policy Analysis and Advocacy.

CONCENTRATION C: Health Behavior and Health Sciences

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2227, Food in the Ancient World; 3344, Genetic Anthropology Lab Techniques; 3345, Genetics in Society; 3346, Human Adaptation and Disease; 3890, Special Topics (as appropriate); 4345, Human Evolutionary Genetics.

BIOLOGICAL SCIENCES: 1105, Human Biology; 1111, First-Year Writing Seminar (as appropriate); 3243 Genetics of Disease; 3245, Biology

of Cancer; 3254, Neurobiology of Behavior; 3270, Statistical Methods in Biology; 3965, Undergraduate Seminar (as appropriate).

BIOMEDICAL ENGINEERING: 3200, Analysis of Biomedical Data.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3221, Health Service Delivery to Diverse Populations; 3311, Introduction to Health Promotion.

MEDICINE, HEALTH, AND SOCIETY: 1930, Social Dimensions of Health and Illness; 1940, Racial and Ethnic Health Disparities; 2120, Health Social Movements; 2330, Men's Health Research and Policy; 2430, Social Capital and Health; 2950, Healing Animals; 3000, Undergraduate Seminar (as appropriate); 3030, Community Health Research; 3450, Mental Illness Narratives; 3890, Special Topics (as appropriate).

NEUROSCIENCE: 2201, Neuroscience; 3235, Biological Basis of Mental Disorders.

PSYCHOLOGY: 1111, First-Year Writing Seminar (as appropriate); 1200, General Psychology; 2100, Quantitative Methods; 2150, Principles of Experimental Design; 3100, Abnormal Psychology; 3620, Schizophrenia; 3625, Depression; 3635, Health Psychology; 3705, Human Sexuality; 3750, Perception; 3760, Mind and Brain; 3785, Brain Damage and Cognition; PSY-PC-1250, Developmental Psychology; PSY-PC 2102, Statistical Analysis; PSY-PC 2110, Introduction to Statistical Analysis; PSY-PC-2250, Cognitive Aspects of Human Development; PSY-PC-2300, PSY-PC- Social and Emotional Context of Cognition; PSY-PC-2550, Adolescent Development; PSY-PC-3650, Advanced Topical Seminar (approval dependent upon topic).

SOCIOLOGY: 1010, 1010W, Introduction to Sociology; 1020, 1020W, Contemporary Social Issues; 1111, First-Year Writing Seminar (as appropriate); 2100, Statistics for Social Scientists; 3002, Introduction to Social Research; 3003, Research Practicum; 3301, Society and Medicine; 3303, Social Dynamics of Mental Health; 4961, Seminars in Selected Topics (as appropriate). **Only one of SOC 1010 or 1020 may be counted towards the major or minor.*

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2240, Introduction to Women's Health.

CONCENTRATION D: Inequality, Intersectionality, and Health Justice

AFRICAN AMERICAN AND DIASPORA STUDIES: 1016, Race Matters; 1111, First-Year Writing Seminar (as appropriate); 3214, Black Masculinity: Social Imagery and Public Policy.

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2342, Biology of Inequality; 3120, Sociocultural Field Methods (as appropriate); 3144, Politics of Reproductive Health; 3343, Biology and Culture of Race; 3345, Genetics and Society; 3890, Special Topics (as appropriate); 4345, Human Evolutionary Genetics.

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 3040, Health and the African American Experience.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3221, Health Service Delivery to Diverse Populations.

MEDICINE, HEALTH, AND SOCIETY: 1940, Racial and Ethnic Health Disparities; 2230, Masculinity and Men's Health; 2240, Bionic Bodies, Disability Cultures; 2330, Men's Health Research and Policy; 2940, Race, Citizenship, and Health; 3000, Undergraduate Seminar (as appropriate); 3030, Community Health Research; 3040, Designing Healthy Publics; 3890, Special Topics (as appropriate).

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3301, Society and Medicine; 3304, Race, Gender, and Health; 3321, Population and Society; 3723, Gender, Sexuality, and the Body; 4961, Seminars in Selected Topics (as appropriate).

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2268, Gender, Race, Justice, and the Environment.

CONCENTRATION E: Medicine, Humanities, and Arts

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 2370, Death and the Body; 3141, Anthropology of Healing; 3142, Medicine, Culture, and the Body; 3143, Medical Anthropology.

ASIAN STUDIES: 2630, Chinese Medicine.

ENGLISH: 1111, First-Year Writing Seminar (as appropriate); 3720, 3720W, Literature, Science, and Technology (as appropriate); 3730, Literature and the Environment: Contemporary Climate Fiction; 3891, Special Topics in Creative Writing (as appropriate).

HISTORY: 1111, First-Year Writing Seminar (as appropriate); 2160, Medicine in Islam; 2800, Modern Medicine; 2810, Women, Health, and Sexuality; 2835, Sexuality and Gender in the Western Tradition to 1700; 2840, Sexuality and Gender in the Western Tradition since 1700; 3040, Health and the African American Experience.

HISTORY OF ART: 3140, Healing and Art in East Asia.

MEDICINE, HEALTH, AND SOCIETY: 1111, First-Year Writing Seminar: Medicine, Health, and the Body; 2230, Masculinity and Men's Health; 2250, War and the Body; 2950, Healing Animals; 3000, Undergraduate Seminar (as appropriate); 3050W, Medicine and Literature; 3150, Death and Dying in America; 3250, Perspectives on Trauma; 3890, Special Topics (as appropriate); 4010, Psychiatry, Culture, and Globalization; 4050, Narrative and Medicine: Stories of Illness and the Doctor-Patient Relationship.

PHILOSOPHY: 1008, 1008W, Introduction to Medical Ethics; 1111, First-Year Writing Seminar (as appropriate); 3606, 3606W, Moral Problems; 3608, Ethics and Medicine; 3630, Philosophy of Mind.

RELIGIOUS STUDIES: 3941, Religion, Science, and Evolution: Psychology of Religious Myth and Ritual.

SOCIOLOGY: 1111, First-Year Writing Seminar (as appropriate).

SPANISH: 4760, Literature and Medicine.

WOMEN'S AND GENDER STUDIES: 1111, First-Year Writing Seminar (as appropriate); 2267, Seminar on Gender and Violence; 2612, Lesbian, Gay, Bisexual, and Transgender Studies.

OTHER ELECTIVES

In addition to the electives listed below, any course from the above concentration areas may serve as an elective if it is not already being used to satisfy a concentration requirement. No more than 12 hours of courses with an asterisk in the list below may be used to satisfy the major. Courses with an asterisk may not be used to satisfy the minor. (Please consult the director of undergraduate studies for approval of "as appropriate" courses for electives.)

ANTHROPOLOGY: 1111, First-Year Writing Seminar (as appropriate); 1301, Introduction to Biological Anthropology; 3372, Human Osteology; 4373, Health and Disease in Ancient Populations.

BIOLOGICAL SCIENCES: *1510–1511, Introduction to Biological Sciences; *2520, Biochemistry.

CHEMISTRY: *2221–2222, Organic Chemistry; *2211–2212, Organic Chemistry for Advanced Placement Students.

HUMAN AND ORGANIZATIONAL DEVELOPMENT (PEABODY): 3342, Introduction to Community Psychology (same as PSY-PC); 3890, Health Promotion Delivery.

MATHEMATICS: 1011, Probability and Statistical Inference; 2810, Probability and Statistics for Engineering; 2820, Introduction to Probability and Mathematical Statistics.

MEDICINE, HEALTH, AND SOCIETY: 1001, Commons Seminar; *1500, Introduction to Microbiology; *1600, Introduction to Nutrition and Health for a Changing World; *3101–3102, Anatomy and Physiology; 3831, Service Learning Research and Readings (Note: 3831, Service Learning Research and Readings, must be taken concurrently with 3830); 3850, Independent

Study; 3881, Internship Readings and Research (Note: 3881, Internship Readings and Research, must be taken concurrently with 3880).

PHILOSOPHY: 1111, First-Year Writing Seminar (as appropriate); 3606, 3606W, Moral Problems; 3630, Philosophy of Mind.

PSYCHOLOGY: 1111, First-Year Writing Seminar (as appropriate); 3600, Personality; 3610, Introduction to Clinical Psychology OR PSY-PC-3200, Introduction to Clinical Psychology; 3615, Emotion; PSY-PC-1205, PSY-PC-1207, Minds, Brains, Cultures, and Contexts; PSY-PC-2400, Social and Personality Development; PSY-PC-2500, Infancy; PSY-PC-2550, PSY-PC-3650, Advanced Topical Seminar (as appropriate).

SOCIOLOGY: 4961, Seminars in Selected Topics (as appropriate).

Course descriptions begin on page 205.

Nanoscience and Nanotechnology

DIRECTORS Paul E. Laibinis, Sandra J. Rosenthal

FACULTY in the School of Engineering and the College of Arts and Science offer an interdisciplinary minor in nanoscience and nanotechnology. The minor is administered by the School of Engineering in collaboration with the College of Arts and Science.

Nanoscience and nanotechnology are based on the ability to synthesize, organize, characterize, and manipulate matter systematically at dimensions of ~ 1 to 100 nm, creating uniquely functional materials that differ in properties from those prepared by traditional approaches. At these length scales, materials can take on new properties that can be exploited in a wide range of applications such as for solar energy conversion, ultra-sensitive sensing, and new types of vaccines. These activities require the integration of expertise from various areas of science and engineering, often relying on methods of synthesis, fabrication, and characterization that are beyond those encountered in an individual course of study.

Students who minor in nanoscience and nanotechnology learn the principles and methods used in this rapidly growing field. Its core originates in the physical sciences by providing key approaches for describing the behavior of matter on the nanoscale. Synthetic approaches are used to manipulate matter systematically, for creating uniquely functional nanomaterials that can be inorganic, organic, biological, or a hybrid of these. With a third component of characterization, a process for designing systems to have particular properties as a result of their composition and nanoscale arrangement emerges. Students are introduced to these areas through foundational and elective courses for the minor that are specified below, the latter of which can be selected to fulfill the degree requirements for their major. The minor in nanoscience and nanotechnology is supported by the Vanderbilt Institute of Nanoscale Science and Engineering (VINSE) that brings together faculty from the College of Arts and Science, the School of Engineering, and the Medical Center. A specialized laboratory facility maintained by VINSE provides students in the minor with capstone experiences that allow them to prepare and characterize a variety of nanostructured systems using in-house state-of-the-art instrumentation. This hands-on laboratory component enhances the attractiveness of students to both employers and graduate schools.

Details of the minor requirements are provided in the School of Engineering section of the catalog.

Neuroscience

DIRECTOR David H. Zald
DIRECTOR OF UNDERGRADUATE STUDIES Elizabeth Catania
SENIOR LECTURER Meredyth Wegener

Steering Committee
PROFESSORS Ren  Marois (Psychology), Douglas G. McMahon (Biological Sciences), Lisa Monteggia (Pharmacology)
ASSOCIATE PROFESSOR Suzanna Herculano-Houzel (Psychology and Biological Sciences)
ASSISTANT PROFESSORS Elizabeth Catania (Neuroscience), Alexander Maier (Psychology)
PRINCIPAL SENIOR LECTURER Leslie M. Smith (Psychology)

THE study of the nervous system is an interdisciplinary enterprise that draws upon a variety of scientific disciplines ranging from molecular biology and biophysics to computational science and engineering to the study of behavior and cognition. To meet the challenge of providing training for entry into this exciting and growing field, Vanderbilt offers an interdisciplinary program of concentration in neuroscience that utilizes expertise from several departments within the university. The program consists of three components. The first provides for a broad foundation in the basic sciences and mathematics. Second, the program provides for exposure to each of the general areas of neuroscience including courses in cellular/molecular, systems, and integrative/cognitive neuroscience. This course work is supplemented with exposure to the laboratory techniques utilized in neuroscience research. Finally, the program allows students to pursue more work in the specific sub-disciplines of neuroscience and in areas of inquiry related to neuroscience through elective courses. Students are especially encouraged to participate in research in the laboratories of neuroscience faculty under the auspices of the undergraduate research courses. More extensive research experience is available through the Honors Program in Neuroscience. For additional information, see as.vanderbilt.edu/neuroscience.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration

The neuroscience major consists of 39 credit hours of course work that includes 8 credit hours of organic chemistry and 31 credit hours of neuroscience and related courses distributed among specific disciplines associated with the study of neuroscience. Students majoring in neuroscience are additionally required to complete a core of introductory courses in mathematics, statistics or computer science, biology and physics that provide the broad scientific background necessary to the study of neuroscience. The areas and associated course options are listed below. Excluding research credit (3861, 3862, 3863, 3864, and 4999), the neuroscience and related courses must be drawn from at least two departments or programs. Students seeking a second major within the College of Arts and Science may count a maximum of 6 credit hours of

2000-or-higher-level course work to meet the requirements of both majors.

Required Math and Science Courses

Biological Sciences (8 credit hours)

BSCI 1510, 1511, 1510L, and either 1511L or 1512L.

Chemistry (8 credit hours)

CHEM 2211 or 2221; CHEM 2212 or 2222; and CHEM 2221L and 2222L.

Mathematics, Statistics, Computer Science (6–8 credit hours)

MATH 1100, 1200, or 1300; and one of MATH 1201, 1301, BSCI 3270, PSY 2100, PSY-PC 2110, CS 1101, 1103.

Physics (8 credit hours)

PHYS 1501, 1601 or 2051; PHYS 1502, 1602 or 2053; PHYS 1501L, 1601L or 2052; and PHYS 1502L, 1602L or 2054.

Neuroscience Courses

Introduction to Neuroscience (3 credit hours)

NSC 2201.

Cellular and Molecular Neuroscience (6 credit hours)

BSCI 3252, 3256; NSC 3235, 3240, 3245, 3260, 3269, 3891; PSY 3630, 3892.

Systems, Integrative, and Cognitive Neuroscience (6 credit hours)

BSCI 3230, 3254; NSC 3270, 3274, 3892, 4961, 4969; PSY 3120, 3620, 3700, 3730, 3750, 3760, 3765, 3775, 3780, 3785, 3892; PSY-PC 3190.

Neuroscience Laboratory (4 credit hours)

NSC 3861, 3862.

Neuroscience Electives (6 credit hours)

Two additional courses from the Cellular and Molecular Neuroscience and/or Systems, Integrative, and Cognitive Neuroscience courses listed above. NSC 3863 or NSC 4999 may be used to count for one elective course.

Related Course Electives

(6 credit hours; two courses not used to satisfy the Required Math and Science course requirement above.)

BSCI 2201, 2201L, 2210, 2210L, 2520, 3270, 4265; BME 3100, 3101; CHEM 2100, 3310, 3710, 4720; CS 1101 or 1103 or 1104; MATH 2300, 2400 or 2420; PHIL 3616, 3630; PSY 2100, 3100, 3600, 3625, 3705, 3715, 3810.

Honors Program

Superior students with a strong interest in research are encouraged to consider the Honors Program in Neuroscience. Normally a student will apply to enter the Honors Program in the second semester of the junior year and assemble an Honors Committee that will consist of the research mentor and at least two other appropriate members of the faculty. Entrance into and satisfactory completion of the Honors Program requires that students maintain a cumulative grade point average of 3.3 and a grade point average of 3.3 in courses counting toward the neuroscience major. Honors candidates must meet all the normal requirements for the neuroscience major, but are expected to complete at least 6 hours of advanced research course work (from NSC 3863, 3864 and 4999). Three of these research-credit hours may count toward neuroscience elective course work. As part of this research course work, the candidate will be expected to write an honors thesis, present the thesis during the final

semester in residence, and satisfactorily pass an oral examination by the student's Honors Committee. Students interested in becoming honors candidates should consult with the director of honors. For more information on the Honors Program, please see as.vanderbilt.edu/neuroscience/the-honors-program.

Minor in Neuroscience

This program provides a foundation of knowledge in neuroscience that is appropriate for students majoring in a related discipline or who have a general interest in the nervous system. As prerequisites, students are required to complete CHEM 1601 and 1601L, BSCI 1510 –1511, 1510L, and either 1511L or 1512L. The minor program consists of 18 credit hours of course work distributed as follows:

NSC 2201.

3 credit hours in Statistics/Computer Science:

BSCI 3270, PSY 2100, PSY-PC 2110, CS 1101 or 1103.

6 credit hours chosen from the courses listed as “Cellular and Molecular Neuroscience.”

6 credit hours chosen from the courses listed as “Systems, Integrative and Cognitive Neuroscience.”

The chosen courses counting towards the 18 credit hours must come from at least 3 different departments or programs (e.g. NSC, PSY and BSCI).

Research courses (NSC 3860, 3861, 3862, 3863, 3864, and 4999) do not count towards the minor.

Course descriptions begin on page 208.

Philosophy

CHAIR Robert Talisse

DIRECTOR OF UNDERGRADUATE STUDIES Scott Aikin

DIRECTOR OF GRADUATE STUDIES Kelly Oliver

PROFESSORS EMERITI Robert R. Ehman, Marilyn Friedman, Larry May, John F. Post, Charles E. Scott, Donald W. Sherburne, Henry A. Teloh, Jeffrey Tlumak

PROFESSORS Lenn E. Goodman, Michael P. Hodges, John Lachs, Kelly Oliver, Lucius T. Outlaw Jr., Robert Talisse, Paul C. Taylor David Wood

ASSOCIATE PROFESSORS Idit Dobbs-Weinstein, Julian Wuerth

ASSISTANT PROFESSORS Scott Aikin, Matthew Congdon, Diana Heney, Karen Ng

SENIOR LECTURER, EMERITUS Russell M. McIntire

SENIOR LECTURERS Jonathan Bremer, Gary Jaeger

THE Department of Philosophy at Vanderbilt offers a wide range of courses relating philosophy to various dimensions of human concern. The department also emphasizes those philosophers and movements that have had a significant, forming effect in Western culture.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Philosophy

The program of concentration should be tailored to the needs and interests of the student. The following distribution of courses is required as part of the major. Logic: 1003 or 3003 (at

least 3 credit hours); Ethics: 1005, 3605, 3606, or 3606W (at least 3 credit hours); History of Philosophy: 2100, 2102, 2103, or 2104 (at least 6 credit hours). Any alterations must be approved by the director of undergraduate studies. We encourage all majors to work closely with their advisers to select courses that form a coherent whole. The student must take at least 30 credit hours in the major field of which at least 21 credit hours must be in courses beyond the 1000 level.

Honors Program

The Honors Program offers opportunities for advanced study in philosophy, including independent research projects and/or enrollment in certain graduate seminars (with permission of the instructor). To be admitted to the program, the student must: (a) be a major in philosophy; (b) have a grade point average of 3.3 in all courses; (c) have a 3.5 grade point average in philosophy courses; and (d) develop a written proposal for advanced study in consultation with a philosophy faculty sponsor. Students who satisfy these requirements should meet with the director of undergraduate studies to review their programs, whereupon the director may nominate the students for honors work. Honors work typically begins in the junior year or in the first semester of the senior year; students in the program must complete at least 3 credit hours of Philosophy 3999. Students who successfully complete the program while maintaining the grade point averages of 3.3 generally, and 3.5 in the major, will receive honors in philosophy; students who do especially distinguished work will receive highest honors.

Minor in Philosophy

The minor in philosophy consists of 18 credit hours, including at least 12 credit hours in courses beyond the 1000 level. The minor program will be constructed so as to provide a broad grounding in philosophy and to complement the student's other studies. Each program must be approved by the director of undergraduate studies.

Note: 1002 or 1002W or 1005 or 1111 are ordinarily taken prior to all other philosophy courses, except 1003 and 3003 (logic courses), 3616 (philosophy of science), and 3013 (aesthetics).

Course descriptions begin on page 209.

Physics and Astronomy

CHAIR M. Shane Hutson

DIRECTOR OF UNDERGRADUATE STUDIES Kalman Varga

DIRECTOR OF GRADUATE STUDIES (Physics) Julia Velkovska

DIRECTOR OF GRADUATE STUDIES (Astrophysics) Andreas Berlind

PROFESSORS EMERITI John Paul Barach, Charles A. Brau, Leonard

C. Feldman, Dennis Hall, Arnold M. Heiser, P. Galen Lenhart, Charles

F. Maguire, Volker E. Oberacker, Akunuri V. Ramayya, C. E. Roos,

Medford S. Webster, Robert A. Weller

PROFESSORS David J. Ernst, John C. Gore, Senta V. Greene, Richard F.

Haglund Jr., Joseph H. Hamilton, Kelly Holley-Bockelmann, M. Shane

Hutson, Will E. Johns, Thomas W. Kephart, Sokrates T. Pantelides,

James A. Patton, Robert J. Scherrer, Paul D. Sheldon, Keivan

G. Stassun, Norman H. Tolk, A. Sait Umar, Kalman Varga, Julia

Velkovska, Thomas J. Weiler, David A. Weintraub, John P. Wikswo Jr.

DISTINGUISHED RESEARCH PROFESSOR C. Robert O'Dell

ASSOCIATE PROFESSORS Andreas Berlind, Steven E. Csorna, Todd E.

Peterson, Jason Valentine, Yaqiong Xu
ASSISTANT PROFESSORS Alfredo Gurrola, William R. Holmes,
Erin Rericha, Jessie C. Runnoe, Stephen R. Taylor
SENIOR LECTURERS Forrest Charnock, Sourish Dutta, Erika
Grundstrom, Momchil Velkovsky

AS fundamental sciences, physics and astronomy continue to be driving intellectual forces in expanding our understanding of the universe, in discovering the scientific basis for new technologies, and in applying these technologies to research. In keeping with this crucial role, the Department of Physics and Astronomy offers courses dealing with both the cultural and intellectual aspects of the disciplines, a broadly based major program flexible enough to serve as preparation for graduate study in physics, applied physics, medical physics, astronomy or astrophysics, professional study in another area, or technical employment, and minor programs for students desiring to combine physics or astronomy with other majors. An honors program is available for qualified departmental majors.

A distinguishing feature of the Vanderbilt undergraduate curriculum is the close coupling between teaching and research. At Vanderbilt, active research groups are studying the physics of elementary particles; nuclear structure and heavy-ion reactions; nonlinear interactions of lasers with materials at ultrafast time scales; the behavior of electrons, atoms, molecules, and photons near surfaces; the electric and magnetic properties of living systems; the structure and dynamics of biopolymers; young stars; and cosmology. All professors are engaged in research, and undergraduate students can participate in this research informally or through independent study or summer work.

The Society of Physics Students arranges informal discussions.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Physics

The departmental major provides a thorough grounding in the core areas of physics. It is suitable either as preparation for careers in science and engineering or as a springboard for applying technical knowledge in such fields as business, medicine, law, public policy, and education. The major in the Department of Physics and Astronomy consists of 31–32 credit hours of course work, distributed as below. Students considering majoring in physics are strongly encouraged to consult with the director of undergraduate studies before registering for classes.

1. *Core courses covering the major subdisciplines of physics* — Students must complete four of the following (12 credit hours): Modern Physics and the Quantum World (2255); Classical Mechanics (2275); Electricity, Magnetism, and Electrodynamics I (2290); Statistical Physics (3200); Quantum Mechanics I (3651).
2. *Laboratory work* — Students may not use AP credit to satisfy any portion of the laboratory sequence requirement (3–4 credit hours):
 - a) Laboratory Principles I (1912L), Laboratory Principles II (2255L), and Introduction to Experimental Research (2953L); or
 - b) 1501L or 1601L, 1502L or 1602L, 2255L, and 2953L if the student has entered the major by taking the introductory

physics course sequence 1501 or 1601, 1501L or 1601L, 1502 or 1602, and 1502L or 1602L. Students considering majoring in physics who begin in 1501 or 1601 and 1501L or 1601L in the fall semester are encouraged to take the combination 1502 + 1912L or 1602 + 1912L in the spring semester.

3. *Electives* (9 credit hours) — Pedagogical course work in physics and/or astronomy; research hours (3850, 3851, 4998) do not count toward this requirement. The course electives may be taken from any 2000-level or higher PHYS or ASTR courses not used to satisfy any other requirement of the major. Other courses may count as electives, such as courses offered by the engineering school (or other departments and schools) that are particularly relevant, such as a course in environmental studies, health physics, optics, or materials science. Such exceptions must be approved by the director of undergraduate studies.
4. *Capstone* (7 credit hours) — Computational Physics (3790), 3 credit hours of research (3850, 3851, or 4998) taken across one or more semesters, and the Seminar in Presenting Physics Research (3600). Physics-related research done in other departments and programs, supervised by Vanderbilt faculty and pre-approved by the director of undergraduate studies, is also permitted in satisfaction of the research requirement.

Immersion Experience: A student majoring in physics may choose to complete their Immersion Experience through an enhanced research program within the disciplines of either physics or astronomy. To complete the Immersion Experience in physics or in astronomy, physics majors must complete at least 5 credit hours of research and earn 1 credit hour from PHYS 3600 (Seminar in Presenting Physics Research) and 3 credit hours from PHYS 3790 (Computational Physics). At least 2 of these credit hours in research must be earned in either 3851 (Undergraduate Immersion Research) or 4998 (Honors Research). The other three (3) credit hours may be from any combination of 3850, 3851, and 4998. Credit hours in research may be from PHYS, from ASTR, or from a combination of PHYS and ASTR courses.

Computer Science course work: All 2000-level and higher PHYS courses assume students have working skills in programming. These skills may be learned outside of a regular course, but should be equivalent to that taught in CS 1101 Programming and Problem Solving. Students who do not already have these skills are strongly advised to take this class in the first semester, prior to beginning the three-semester laboratory sequence in the second semester. In addition, the following Computer Science and/or Scientific Computing courses are strongly recommended for all physics majors: Program Design and Data Structures (CS 2201) or Program Design and Data Structures for Scientific Computing (CS 2204); Algorithms (CS 3250) or Scientific Computing Toolbox (SC 3250); and High Performance Computing (SC 3260). Physics majors pursuing a second major or minor in computer science should take CS 2201; physics majors pursuing a minor in scientific computing should take CS 2204.

Mathematics course work: All physics majors are expected to have high-level skills in mathematics in order to be successful in PHYS classes and to prepare for graduate work. MATH courses are not formally required for the major in physics; however, most physics courses identify MATH prerequisite or co-requisite courses in order to indicate the mathematical skill-level assumed for that class. Multivariable calculus is a co-requisite

for 2255 and a prerequisite for all other 2000-level or higher PHYS courses. Physics majors are expected to develop a working knowledge of single-variable calculus, multivariable calculus, and ordinary differential equations. The following courses are those strongly recommended for physics majors:

1. Accelerated Calculus I (1300) and Accelerated Calculus II (1301);
2. Multivariable Calculus (2300) or Multivariable Calculus and Linear Algebra (2500 and 2501); and
3. Methods of Ordinary Differential Equations (2420) or Ordinary Differential Equations (2610).

In addition, for physics majors considering post-graduate work in physics or in a related field, the following PHYS and MATH courses are strongly recommended as electives:

1. Electricity, Magnetism, and Electrodynamics II (PHYS 2291), Quantum Mechanics II (PHYS 3652), Mathematical Methods of Physics (PHYS 4005); and
2. Methods of Linear Algebra (MATH 2410) or Linear Algebra (MATH 2600); Introduction to Probability and Mathematical Statistics (MATH 2820); Statistics Laboratory (MATH 2820L); Complex Variables (MATH 3110); Introduction to Partial Differential Equations (MATH 3120); Fourier Analysis (MATH 3130); and Advanced Engineering Mathematics (MATH 3600).

Licensure for Teaching

Candidates for teacher licensure in physics at the secondary level may qualify by taking the basic physics major together with the requisite education courses described in the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Honors Program

The Honors Program in the Department of Physics and Astronomy is designed to allow a student to engage in advanced research under the guidance of a faculty member, usually in an area related to an ongoing research program in the department. A student majoring in physics interested in Honors (Honors in Physics or Honors in Astronomy) will work with a faculty mentor to develop an appropriate research project that will be conducted under the guidance of that faculty member. The Honors project must have a substantial grounding in physics or astronomy, but may be conducted under the direct supervision of any faculty member in any department at Vanderbilt. To be admitted to the Honors Program, a student must submit a two-page research proposal describing the plans for their Honors project, which must be approved by the director of the departmental Honors Program. In addition, a student must have completed 2953L, either 2255 or 3651, and meet the minimum GPA requirements for honors programs of the College of Arts and Science.

To graduate with honors, a student must

- Have at least a 3.300 cumulative GPA and a 3.300 GPA in courses that count toward the major.
- Earn a minimum of 6 credit hours in research classes (3850, 3851, 4998), leading to an honors thesis, with at least 2 of these credit hours earned in 4998. A student who earns credit for 3852 may satisfy this portion of the requirement with 3 credit hours of research earned at Vanderbilt, including at least 2 of these credit hours in 4998.

- Write a senior thesis of high merit, as evaluated by the student's Honors Examination Committee; the thesis may be submitted either in the fall or spring semester of the senior year.
- Demonstrate high attainment on an oral honors examination in which they present and defend their work to the student's Honors Examination Committee; the oral examination may take place either in the fall or spring semester of the senior year.

Departmental Minors

The physics and astronomy minors are suitable for students who wish to supplement a related discipline or simply have a general interest in the field. Research is not a requirement for either minor.

Minor in Physics

The minor requires a minimum of 19 credit hours of course work, distributed as follows:

Any first-semester physics class (1501, 1601, 1911, 2051)	3-4
Any first-semester physics laboratory (1501L, 1601L, 1912L, 2052)	1
Any second-semester physics class (1502, 1602, 1912, 2053)	3-4
Any second-semester physics laboratory (1502L, 1602L, 2255L, 2054)	1
PHYS 2255 or 3651	3
6 credit hours of electives.	6
These may be selected from any 2000-level or higher-level PHYS courses not used to satisfy the above requirements or from 3 credit hour non-PHYS courses, the latter if approved by the director of undergraduate studies, and may include up to 3 credit hours of research (3850, 3851, 4998).	

Total credit hours: 17-19

Minor in Astronomy

The minor requires a minimum of 16 credit hours of course work, distributed as follows:

ASTR 1010 and either 1010L or 1020L; or 1210	4
ASTR 2110	3
ASTR 3000	3
Two other astronomy courses, one of which may be a 3 credit hour one-semester research project (3850, 3851, 4998). Note that only physics majors pursuing honors in astronomy are eligible to enroll in 4998.	6

Total credit hours: 16

Physics

Course descriptions begin on page 211.

Introductory Courses

1001, 1010, 1010L, 1111, 1501, 1501L, 1502, 1502L, 1601, 1601L, 1602, 1602L, 1911, 1912, 1912L, 2255L

Introductory, calculus-based physics is offered at several different levels, each with the appropriate laboratory. Only one of 1501/1601/1911 and one of 1502/1602/1912 may be taken for credit. Physics 1501-1502/1501L-1502L is intended for students in the health sciences. Physics 1601-1602/1601L-1602L is intended for students in engineering. Physics 1911-1912 and the labs 1912L-2255L are intended for students planning to major in physics or pursue research-oriented careers in science, engineering, or mathematics; however, students may major in physics after starting in any of these three introductory physics sequences. Prospective majors are strongly advised to begin their study of physics in the fall semester of their freshman year whenever possible, although with careful planning it is possible to complete the physics major with a later start. Physics 1110 is intended for students without strong backgrounds in mathematics or science who have a general interest in the subject. 1110 is not recommended as preparation for further study in a natural science, is not appropriate for engineering, premedical, or pre-dental students, and does not count toward the physics major or minor.

Intermediate Courses

2210, 2255, 2275, 2290, 2660, 2953L, 3122, 3200, 3600

The intermediate-level courses cover the major subdisciplines of classical and modern physics.

Advanced Courses

2291, 3640, 3651, 3652, 3660, 3790, 3850, 3851, 3890, 4998

These courses are intended for physics majors in their junior and senior year and provide material supporting independent study or honors projects in physics.

Medical and Health Physics Courses

3125, 3645

Physics Education Courses

3820

Astronomy

Course descriptions begin on page 157.

Introductory Courses

1001, 1010, 1010L, 1020L, 1111, 1210

Intermediate Courses

2110, 2130, 2150, 3000

Advanced Courses

3600, 3700, 3800, 3850, 3851, 3900, 4998

Political Science

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 Kristin Michelitch, Peter Schram, Bradley C. Smith, Sharee Thrower,
 Keith Weghorst
 SENIOR LECTURERS Alex Dubliet, Carrie A. Russell

THE Department of Political Science is oriented toward both teaching and research and has multiple missions. First, it offers a balanced curriculum for undergraduates and graduate students to study the art and science of politics. Second, it offers training for students preparing to become professionals in political science and other fields. Third, it exists as a research faculty seeking new knowledge about government and politics.

Many members of the faculty have national and international reputations in their fields of scholarship. These research and teaching interests vary widely, from political leadership to the comparison of new and old democratic governments, issues of political economy, and ethical questions about politics.

Political science majors may participate in independent study, directed study, selected topics seminars, first-year seminars, the Honors Program, and internships. Average class size is close to thirty—small classes make personal contact with the faculty relatively easy. Students participate in the governance of the department through the Undergraduate Political Science Association, and may qualify for membership in Pi Sigma Alpha, the national political science honorary society.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Political Science

Students majoring in political science are required to complete a minimum of 30 credit hours of work, distributed as follows:

Major Concentration	Hours
<i>Political Science Core</i> 1100, 1101, 1102, 1103 or 1150	6
<i>American Government and Politics</i> (2240, 2245, 3241, 2243, 2251, 2255, 2256, 2259, 2262, 2265, 2266, 2267, 2270, 3244, 3247, 3249, 3250, 3252, 3253, 3254, 3260, 3893)	3

<i>Comparative Politics</i> (2210, 2213, 2215, 2219, 2223, 2230, 2236, 2237, 2270, 3211, 3217, 3228, 3235, 3272W, 3894, 4238)	3
<i>International Relations</i> (2221, 2222, 2223, 2225, 2226, 2236, 2263, 2270, 2273, 2274, 3211, 3228, 3229, 3272W, 3275, 3895, 4277)	3
<i>Political Theory</i> (2202, 2203, 2205, 2207, 2207W, 2208, 2209, 2263, 3253, 4257, 3258, 3264W, 3271, 3896)	3
<i>Electives</i> (Any 2000, 3000, or 4000-level course listed above; 3897; one additional 1100-level course, including 1111; up to 6 credit hours of 3841, 3842, 3851, 3852, 3880, 3882, 3882, 3883, 4998, 4999 combined)	12

Minimum 30 credit hours total

In order to graduate with a political science major, students must take a brief exam within the major concentration in which they are most interested during their senior year. Students are to take this exam in the fall of their senior year (students who are on leave or are studying abroad during the fall semester of their senior year should schedule the exam upon their return to campus). The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to ascertain the extent to which political science majors are retaining core aspects of the political science curriculum.

In meeting the above requirements, students must develop a specialty within one of the four concentrations of American Government, Comparative Politics, International Relations, or Political Theory by taking the introductory, 1000-level course in that concentration, and at least three 2000-level courses in that concentration. It is recommended that one of those 2000-level courses in the student's selected concentration be a seminar.

Students desiring an emphasis on African American politics within their program of concentration should consider courses in the following group: 2240, 2255, 2265, 2266. They may also choose to elect the following courses at Fisk University: Political Science 245 (Afro-American Political Thought), 254 (Politics in the Black Community), and 406 (African Political Systems).

Graduate Courses. Qualified undergraduates may enroll in graduate courses with the consent of their adviser, the course instructor, and the Graduate School. To enroll in graduate courses, undergraduate applicants need to comply with rules provided under the heading Undergraduate Enrollment in Graduate Courses in this catalog on p. 64.

Honors Program

To enter the Honors Program, students should have completed all but 6 credit hours of the AXLE requirements, and have a minimum overall GPA of 3.6. They should also have a minimum GPA of 3.6 in all the political science courses they have taken up to the point at which they enter the Honors Program. They must have exhibited to the department additional evidence of an ability to do independent work. Finally, they must be nominated by the director of the undergraduate studies program.

In addition to requirements set by the College of Arts and Science, the following requirements must be met in order for honors in political science to be awarded:

- 30 credit hours in political science, as well as all of the requirements for political science majors.

2. 3.6 grade point average in all political science courses, and a 3.6 average in courses that count toward honors in political science.
3. Completion of an honors thesis under the direction of a faculty adviser. Students will enroll in Senior Honors Research (4998 and 4999) during the semesters when they work on the honors thesis (at least 3 credit hours each).
4. An oral exam on the honors thesis in the last semester of the senior year.

Students in the Honors Program are encouraged to take PSCI 2270 before they enter or during their first semester in the Honors Program.

A three-member Honors Committee will be appointed to administer each student's program. Students should submit the names of a faculty adviser and the other two members of the committee to the director of the Honors Program as soon as possible after they are accepted into the Honors Program. The committee will administer the oral examination, after which it will also decide whether the student will receive honors or highest honors. *Successful candidates are awarded honors or highest honors in their field and this designation appears in the Commencement program and on their diplomas.*

Minors in Political Science

The Department of Political Science offers three minor concentrations, which are detailed below. Each consists of 18 credit hours (one introductory-level course and five upper-level courses). One of these options may be chosen:

Minor Concentration

Hours

American Politics

1100 or 1150

Any five of the following:

2222, 2240, 2251, 2243, 2245, 2255, 2256, 2259, 2262, 2265, 2266, 2267, 2270, 3241, 3244, 3247, 3249, 3250, 3252, 3253, 3254, 3260, 3268, 3893, 3897

3

15

Political Theory

1103

Any five of the following:

2202, 2203, 2205, 2207, 2207W, 2208, 2209, 2262, 2263, 3253, 3258, 3264W, 3271, 3896, 4257

3

15

World Politics

A student may stress comparative politics or international relations or may mix the two in this minor.

1101 or 1102

Any five of the following:

2210, 2213, 2215, 2216, 2219, 2220, 2222, 2223, 2225, 2226, 2230, 2236, 2237, 2270, 2273, 2274, 3211, 3217, 3228, 3229, 3235, 3272W, 3275, 3894, 3895, 4238, 4277

3

15

Licensure for Teaching

Candidates for teacher licensure in political science at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Course descriptions begin on page 213.

Psychology

CHAIR René Marois

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DIRECTOR OF GRADUATE STUDIES Geoffrey Woodman

DIRECTOR OF CLINICAL TRAINING Bunmi O. Olatunji

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Polyn, David G. Schlundt, Andrew J. Tomarken, Jennifer S. Trueblood,

Thilo Womelsdorf, Geoffrey Woodman

ASSISTANT PROFESSOR Antonia Kaczurkin

PRINCIPAL SENIOR LECTURER Leslie M. Smith

SENIOR LECTURERS Ashleigh M. Maxcey, Elisabeth H. Sandberg,

Adriane E. Seiffert

PSYCHOLOGY is the scientific study of brain, behavior, and cognitive processes. At Vanderbilt, the undergraduate program introduces students to the major areas of contemporary psychology: clinical science, human cognition and cognitive neuroscience, developmental psychology, neuroscience, and social psychology. Clinical science studies human personality, emotion, abnormal behavior, and therapeutic treatments. Human cognition and cognitive neuroscience are the study of processes such as learning, remembering, perceiving objects and events, and neural mechanisms underlying these processes. Developmental psychology examines human development from conception through adulthood, including cognitive, emotional, physical, and social aspects. Neuroscience studies the structure and function of the brain and how nerve cells process sensory information, mediate decisions, and control motor actions. Social psychology examines interpersonal and intergroup relations and the influence of social conditions on cognitive, emotional, and behavioral processes.

The Department of Psychology offers a general program of study for students who desire a broad background in contemporary psychology, as well as an honors program. The department offers a wide variety of opportunities for undergraduates to gain research experience through active participation in faculty research projects. Such research experience is considered a fundamental aspect of education in psychological science.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Programs of Concentration in Psychology

General Program

PSY 1200

PSY 2100 or PSY-PC 2110 (Peabody)

PSY 2150

4 Distribution Courses*

5 Psychology Electives**

Total credit hours: 36

Honors Program

PSY 1200

PSY 2100 or PSY-PC 2110 (Peabody)

PSY 2150

4 Distribution Courses*

2 or all 3 of PSY 3980, 3981, and 4998

PSY 4999

3 Psychology Electives

Students who only take two semesters of PSY 3980, 3981, and 4998 will need to take an additional elective course to fulfill their 42 credit hours.

Total credit hours: 42

Honors Program. The Honors Program offers qualified majors the opportunity to conduct research projects in collaboration with faculty members. This research culminates in the writing and public presentation of a senior thesis.

The Honors Program offers unusual opportunities for interested and qualified students, including special seminars and individual research projects. The program should substantially aid those intending to do graduate work.

The program requires three or four semesters of honors research and participation in the Honors Seminars, which are PSY 3980, 3981, 4998, and 4999. (Students must have at least 9 credit hours total, with mandatory enrollment in PSY 4999). Students may enroll in the three-semester options of the Honors Program—provided they can complete the research project by extra work during three regular semesters and/or a summer, and provided this arrangement is acceptable to the faculty mentor and to the director of the Honors Program. Students who take the three-semester option will need to take an additional PSY elective course to fulfill their 42 credit hours.

Students who are majoring in psychology should apply to the Honors Program at the end of their sophomore year. Applicants are required to have a cumulative grade point average of at least 3.3, both overall and in all courses that count toward the psychology major. Students must also find a faculty mentor who is willing to sponsor them in the program. Students who intend to apply the three-semester option should identify a faculty mentor and obtain permission for the option at the end of their sophomore year, but are not required to apply to the program until the end of the first term of their junior year. Students who complete the program successfully and have a final cumulative and major grade point average of 3.3 or higher will receive honors or highest honors in psychology.

** Distribution Courses*

(at least 4 of the following 6 courses are required)

The following courses provide grounding in core content areas of psychological science.

PSY 3100, 3110, 3120, 3750; NSC 2201; PSY-PC 1250 (Peabody)

*** Electives*

Any course in the Department of Psychology (A&S) or the Department of Psychology and Human Development (Peabody) that is not being used to meet another psychology requirement can be used as an elective.

Comprehensive Exam

In order to graduate with a psychology major, students must take a comprehensive exam during their senior year. Students are expected to take the comprehensive exam in the fall semester of their senior year. Students who are on leave or are studying abroad during the fall semester of their senior year should schedule to take the exam upon their return to campus. The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to assess the extent to which psychology majors are retaining core aspects of the psychology curriculum.

Minor in Psychology

The minor in psychology is intended for those students who want to gain an overview of the science of psychology and its methodological foundations, and to sample more advanced work in the areas of specialization within psychology at Vanderbilt.

Students are required to complete 18 credit hours of course work inside the department, distributed as follows:

PSY 1200	3
Either PSY 2100 or PSY-PC 2110 (Peabody)	3
PSY 2150	3
Two courses from the list of Distribution Courses specified for the major	6
One psychology elective as defined in the psychology major	3
Total credit hours:	18

Independent/Directed Study courses (3850 and 3840/3860) may not be counted as the elective course for minors.

1200 (or 1111, sections 1, 2, and 3) is prerequisite for all other psychology courses except 1111. PSY 1111 – 01, 02, 03 – General Psychology, First-Year Writing Seminar – covers the same material as PSY 1200 and also serves as the introductory prerequisite for all 2000-level courses in psychology. Credit cannot be earned for both PSY 1200 and PSY 1111 – 01, 02, or 03. PSY 1111 – sections 4 and higher – are First-Year Writing Seminars on special topics in psychology. PSY 1111 – sections 4 and higher – do not replace PSY 1200 as a prerequisite for all 2000-level courses in psychology and may be taken in conjunction with PSY 1200.

Note: NSC courses 2201 (Neuroscience), 3235 (Biological Basis of Mental Disorders), 3269 (Developmental Neuroscience), 3270 (Computational Neuroscience), 3272 (Structure and Function of the Cerebral Cortex), and 3274 (Neuroanatomy) count as courses in the Department of Psychology (A&S). See the Neuroscience course listings for descriptions of these classes.

Course descriptions begin on page 217.

Public Policy Studies

DIRECTOR Christopher Carpenter (Economics)
 ASSOCIATE DIRECTOR Katherine Carroll (Political Science)
 ADVISORY BOARD Kathryn Anderson (Economics), Jay Clayton (English),
 David Lewis (Political Science)
 VISITING PROFESSOR Richard Riebeling
 ADJUNCT PROFESSOR Bill Purcell
 ASSOCIATE PROFESSOR Zdravka Tzankova (Sociology)
 ASSISTANT PROFESSORS Rachel Donnelly (Sociology), Lauren Gaydosch
 (Medicine, Health, and Society), Patrick Greiner (Sociology), Analisa
 Packham (Economics)
 SENIOR LECTURER Carrie A. Russell (Political Science)

Program of Concentration in Public Policy Studies

The public policy studies major has two components: the core curriculum and areas of concentration, and an optional honors program for those who qualify. Students are also required to complete several prerequisites to prepare them for the major. Students may not double count any single course for both a required part of the core and for an elective.

The proposed core is interdisciplinary and includes rigorous course work drawn from political science, economics, sociology, anthropology, and history. The core provides all PPS students training in the politics, economics, methods, social contexts, history, and ethics of public policy.

In addition to developing skills in the core curriculum, PPS students seek more intensive training within areas of concentration. The boundaries of these areas are not mutually exclusive, and together they span a wide range of policy concerns and disciplinary perspectives. Among the five elective courses, students must take three courses in a single area of concentration. It is also recommended that students choose electives from at least two disciplines. Students pursuing the “economic policy” concentration must take at least two upper-level electives in economics from the list (numbered above 3000).

Prerequisites

PPS majors must have earned credit for MATH 1201 or 1301, or higher; basic statistics (ECON 1500 or 1510 or both MATH 2820L and either 2810 or 2820); and introductory courses in political science and economics (PSCI 1100, ECON 1010, and ECON 1020).

Core Curriculum (5 courses, 15 credit hours)

PSCI 2256 or PPS 2100	3 credit hours
ECON 3010, 3012, 3020, or 3022	3 credit hours
ECON 3032, 3035, 3050; SOC 3002; or HOD 2500	3 credit hours
PPS 2200 and 2250	6 credit hours

If a student cannot take both 2200 and 2250, they may, with prior approval from the director or associate director of Public Policy Studies, substitute one course from ANTH 3122, 3133, 4152; HIST 2722; PSCI 3253; SOC 3315, 3604, 3605, 3613, 3614.

Electives and Areas of Concentration (5 courses, 15 credit hours)

The track is intended to allow students to go more deeply into one area of public policy (for example: health policy, STEM policy, education policy, criminal justice policy). Each student is free to choose and design his or her own track with the advice and approval of the program director. Classes should generally be upper-level and should represent at least two disciplines.

General Electives

The following courses may count as PPS general electives, but they do not count toward the three electives (9 credit hours) that must be taken within a single area of concentration:
 PSCI 2240, 2245, 2253, 3241, 3244.

Areas of Concentration

Advanced Quantitative Methods for Public Policy

PPS 3200 or 3250 ; ANTH 3261; ECON 4050; HOD 3200;
 PSCI 2300

Economic Policy

ECON 2150, 3150, 3200, 3230, 3250, 3700, 4110, 4210,
 4510/4510W, 4530/4530W; HIST 1640, 1660; HODE 3225;
 PSCI 2223, 3252

Social Policy

ECON 3100, 3110, 3350; HIST 1440, 1665, 2690, 2740, 2810,
 3040, 3045W; MHS 2110, 3020, 3220, 3030, 3320; SOC 3223,
 3304, 3611, 3616, 3621, 3622, 3701, 3711; UNIV 3320, 3325

Environmental, Resource, and Energy Policy

ANTH 2109, 2150, 3134; ECON 2170; SOC 3311, 3312, 3314,
 3315, 3316, 3317, 3318

International and Foreign Policy

AMER 3200; ASIA 2560; ECON 2220, 3600, 3610, 3650,
 4520; HIST 1690, 1691, 1730, 1740, 2457, 2535, 2700, 2710, 2721,
 2722, 2735, 2740; JS 2540; MHS 2410, 2420, 3110; PSCI 2220,
 2222, 2225, 2236, 2251, 3229, 3272W, 3275; WGS 3201, 3281

Science, Technology, and Innovation Policy

CMST 2950; CSET 3090, 3100; ECON 3270; HIST 2780,
 3050, 3070W; MHS 3120; PHIL 1008, 3608; SOC 3206

Honors Track (2 additional courses, 6 additional hours)

Students who have a GPA of 3.30 or higher for all previous courses taken for credit and a GPA of 3.50 for all courses counting toward the PPS major may apply for the honors track in PPS. Students normally apply for the honors track during the second semester of their junior year. By the end of the junior year, students interested in pursuing honors should have completed all of the required core courses in the PPS major. The PPS program director may make exceptions.

Those accepted into the honors track enroll in PPS 4980 and 4999 (3 credit hours each) during the fall or spring semesters of their senior year. In addition to the honors seminar, each honors student has a faculty adviser to provide guidance on the research project and to chair the thesis committee. Successful completion of the honors program entails both the production of an original written thesis and an oral exam on the thesis project. The thesis committee evaluates both the written thesis and oral exam.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Course descriptions begin on page 219.

Religious Studies

CHAIR Tony K. Stewart
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THE Department of Religious Studies approaches religion as a fundamentally human experience. The academic study of religion begins descriptively by exploring religious commitments, identities, practices, worldviews, and institutions. Our courses investigate religious traditions through varied theoretical and methodological approaches that generate a complex understanding of religious perspectives from an array of disciplines such as anthropology, sociology, history, theology, literature, and art.

Students majoring in religious studies gain a deep knowledge of a single tradition, region, or theme and a broad understanding of religions around the world. Successful students develop a highly portable analytical skill set that equips them to pursue graduate degrees in religion or cognate disciplines, as well as professional degrees and careers in fields such as law, diplomacy, medicine, and business. It also provides an excellent second major for a variety of disciplines that address the human condition including neuroscience; sociology; history; medicine, health, and society; and others. Majors will gain the ability to reason intelligently about one of the most difficult and sensitive topics in any society. By virtue of the variety of religious cultures studied, the training will deepen students' mutual understanding and sensitivity to prepare them to become truly responsible global citizens.

The department offers a major (31 credit hours), an Honors Program, a minor (18 credit hours) in religious studies, a minor (20 credit hours) in Islamic studies, and a minor in Arabic language (18 credit hours). A student may pursue both the minor in Islamic studies and the minor in Arabic language. In such a case, ARA 1102 may be the only Arabic course that counts toward the minor in Islamic studies.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Religious Studies

31 credit hours. The program of concentration in religious studies seeks to introduce students to the rich diversity of religious traditions in the world (*Breadth* component) and to build depth of study in areas of specific interest to the student (*Depth* component). In addition, the curriculum includes instruction in the range of theories and methods used to approach religious traditions academically (*Tools of the Discipline* component). The student will then be able to pursue individual interests (*electives*).

A maximum of two courses (6 credit hours) outside of the department may count toward the major. Of these, one course (3 credit hours) outside of the department may count toward the Depth Component. A foreign language course approved as an elective is *not* subject to the two-course (6 credit hours) limit. No course may be used to satisfy more than one of the four components of the major.

1. Breadth Component (9 credit hours)

Ensures a familiarity with the rich diversity of religious traditions in the world.

- a. **Encountering religious diversity.** 3 credit hours. RLST 1010. An introduction to the field of religious studies and select traditions.
- b. **Introductory course in African or Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in the Mediterranean, Middle East, Africa, or the Americas (including but not limited to Judaism, Christianity, Islam, Egyptian religions, traditions of Sub-Saharan Africa, Native American traditions). RLST 1100, 1200, 1208, 1309, 1500. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.
- c. **Introductory course in Asian or non-Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in Asia or the Pacific (including but not limited to Hindu and Buddhist traditions and those religious traditions originating in East and South Asia). RLST 1637, 1700, 1710, 2644, 2664. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.

2. Depth Component (9 credit hours)

The Depth Component is organized according to three tracks: *traditions*, *geographies*, and *theories and themes*. The introductory course taken to satisfy the breadth requirement cannot be double-counted in this category. The student must choose 9 credit hours from *one* of the following tracks. An appropriate First-Year Writing Seminar RLST 1111 may count toward any track with the approval of the director of undergraduate studies in Religious Studies.

- a. **Traditions.** Allows students to focus on a particular religious tradition or related cluster of traditions that may transcend geographic limitations.

Buddhist Traditions: RLST 1700, 1710, 1637, 2644, 3669, 3670W, 3749, 3753; ASIA 3633

Christian Traditions: RLST 1309, 1330W, 1820, 2250W, 2310, 3119, 3304W, 3306, 3312, 3313, 3316, 3350; CLAS 3350, 3360, 3370, 3380; HIST 1760, 2250

Hindu Traditions: RLST 2664, 4665, 4666

Indigenous Traditions: RLST 1637, 3178, 3890, 4774

Islamic Traditions: RLST 1500, 2461, 3561, 4551, 4552, 4554, 4562; ARA 3301; HIST 1190, 2140, 2190

Jewish Traditions: RLST 1208, 2210, 2210W, 3270, 3350; JS 1002*, 1002W, 1200, 2300, 2330, 2620; PHIL 2102 (*Formerly RLST 1200. Can be taken in lieu of RLST 1200 credit.)

- b. **Geographies.** Gives students the option of focusing on regional cultures, histories, and religions, as well as relationships between religious traditions within a specific region.

Africa, West Asia, and the Mediterranean: RLST 1208, 1330W, 1500, 2461, 2471, 2472, 3312, 3890, 4562; ARA 3301; HIST 1190, 2190

The Americas: RLST 1100, 1190W, 3119, 3142, 3178, 3304; HIST 2530

East Asia: RLST 1700, 1710, 3747, 3749, 3753, 3670W, 3775, 4774; ASIA 3633

South/Southeast Asia: RLST 1500, 1637, 2644, 2664, 3561, 3669, 3670W, 4665, 4666

- c. **Theories and Themes.** Enables students to focus on theoretical, scientific, or thematic questions that may cross both traditional and geographic lines.

Religion in the literary and visual arts: RLST 2881, 2940, 3669, 3775, 4665, 4774, 4939

Theories of religion, science, and/or psychology: RLST 1820, 2472, 3079, 3940, 3941, 4834, 4835, 4836, 4837; JS 2330; ANTH 3141; ASTR 2130

3. *Tools of the Discipline Component* (4–6 credit hours)

Key issues in the study of religion and a formal introduction to the theories and methods in the academic study of religion.

- a. **Theory and Method.** 3 credit hours. RLST 4960W “Approaches to the Academic Study of Religion.” Recommended for juniors, but may be taken earlier with permission of director of undergraduate studies in Religious Studies.
- b. **Majors Colloquium.** 1 credit hour (may be taken a total of three times). RLST 4970 “Majors Colloquium.” Initiation into the range of professional activities in the study of religion from the craft of research to the production of papers, articles, and theses, coupled with targeted theoretical concerns relevant to the research of the students enrolled in that particular class.

4. *Electives* (9 credit hours)

- a. Electives may be drawn from any of the courses listed under the three components of the major (*Breadth*, *Depth*, and *Tools of the Discipline*). Students may elect to deepen an area of study or they may build additional breadth in other traditions, regions, or themes.
- b. One relevant language course (at least 3 credit hours) may count, with the approval of the director of undergraduate studies in Religious Studies. This course is not subject to the two-course (6 credit hours) limit on courses taken outside the department.

Honors in Religious Studies

The honors thesis provides an opportunity for highly motivated and exceptionally capable students to engage in independent work on a topic in religious studies. Honors theses require original research with primary sources and extensive use of relevant secondary scholarship, both with regard to the narrowly defined topic of the thesis and on the larger theoretical and methodological issues in the academic study of religion. 3.3 GPA in courses toward the major and cumulative 3.3 GPA are required for entry and must be maintained for completion of honors. Students work closely with faculty members in designing, researching, and writing a thesis beginning in the second semester of their junior year in order to present the thesis at the end of the second semester of their senior year, culminating in a final oral examination on the thesis.

- a. **Research and Writing.** 6 credit hours. RLST 4998–RLST 4999 “Seniors Honors Thesis.” RLST 4998 and RLST 4999 count as 6 of the 9 credit hours of the elective component of the major.
- b. **Majors Colloquium – Co-requisite with RLST 4999.** RLST 4970 “Majors Colloquium” in the second semester of senior year, in which candidate must present results of research. Honor program candidates shall take 4970 co-requisite with 4999. Initiation into the range of professional activities in the study of religion from the craft of research to the production of papers, articles, and theses, coupled with targeted theoretical concerns relevant to the research of the students enrolled in that particular class.

Minor in Religious Studies

18 credit hours. The minor will introduce the rich diversity of religious traditions (*Breadth* component), initiate depth in at least one tradition (*Depth* component), and encourage further exploration of different perspectives or traditions through electives. A maximum of one course (3 credit hours) from outside the department may count if it is included in any of the three components of the major (*Breadth*, *Depth*, and *Tools of the Discipline*). No course may be used to satisfy more than one of the three components of the minor.

1. *Breadth Component* (9 credit hours)

Ensures a familiarity with the rich diversity of religious traditions in the world.

- a. **Encountering religious diversity.** 3 credit hours. RLST 1010 Encountering Religious Diversity. An introduction to the field of religious studies and select traditions.
- b. **Introductory course in African or Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in the Mediterranean, Middle East, Africa, or the Americas (including but not limited to Judaism, Christianity, Islam, Egyptian religions, traditions of Sub-Saharan Africa, Native American traditions). RLST 1100, 1200, 1208, 1309, 1500. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.
- c. **Introductory course in Asian or non-Western traditions.** 3 credit hours. Introductory course in a religious tradition originating in Asia or the Pacific, including but not limited to Hindu and Buddhist traditions and those religious traditions originating in East and South Asia. RLST 1637,

1700, 1710, 2644, 2664. An appropriate First-Year Writing Seminar RLST 1111 may count with the approval of the director of undergraduate studies in Religious Studies.

2. Depth Component (3 credit hours)

- **Deepening the study of one tradition. 3 credit hours.** The student must choose one of the two religious traditions used to meet the introductory course Breadth Component to delve further into that religion.

3. Electives (6 credit hours)

- Electives may be drawn from any of the courses listed under the three components of the major (Breadth, Depth, and Tools of the Discipline). Students may elect to deepen an area of study or they may build additional breadth in other traditions, regions, or themes.
- With the permission of the director of undergraduate studies in Religious Studies and a minimum 3.3 GPA in the minor, the student may take the Majors Colloquium RLST 4970.

Minor in Islamic Studies

20 credit hours. Students complete a required minimum of 20 credit hours from the list below, which must include:

- ARA 1102 Elementary Arabic, and
- RLST 1500 Introduction to Islam or HIST 1190 A History of Islam, and
- RLST 4554 The Qur'an and Its Interpreters.

Both RLST 1500 and HIST 1190 may count toward the minor. Up to 8 hours of Arabic language courses may count toward the minor; however, ARA 1101 does not count toward the minor.

ARABIC: 1102, Elementary Arabic; 2201–2202, Intermediate Arabic; 3101–3102, Advanced Arabic; 3201, Media Arabic; 3301, Arabic of the Qur'an and Other Classical Texts.

CINEMA AND MEDIA ARTS: 3892, Cinema and Islam.

CLASSICAL AND MEDITERRANEAN STUDIES: 2180, Mediterranean World from Late Antiquity to the Middle Ages; 3010, The Ancient Origins of Religious Conflict in the Middle East.

HISTORY: 1111, First-Year Writing Seminar (when related to Islamic history or culture as determined by the director of undergraduate studies); 1160, Modern South Asia; 1190, A History of Islam; 1200, The Arab Spring; 1270, Sub-Saharan Africa: 1400–1800; 1280, Africa since 1800: The Revolutionary Years; 2140, The Mughal World; 2150, India and the Indian Ocean; 2155, Muhammad and Early Islam; 2160, Medicine in Islam; 2170, Islam and the Crusades; 2180, Islamic Narratives: Narratives of Islam; 2190, Last Empire of Islam; 2293, Muslims in Modern Europe; 2530, African Religions in the Americas; 3150, Cities of Europe and the Middle East; 3209, Sex, Marriage, and the Body in Islamic Law; 3210, Muslims, Christians, and Jews in Medieval Spain; 3220W Images of India.

HINDI/URDU: 1101–1102 Elementary Hindi-Urdu; 2201–2202 Intermediate Hindi-Urdu.

HISTORY OF ART: 1220, History of Asian Art and Architecture, 2180, Art and Architecture of the Islamic World.

JEWISH STUDIES: 2540, Power and Diplomacy in Modern Middle East; 2600, Islam and the Jews.

PHILOSOPHY: 2102, Medieval Philosophy; 3006, Islamic Philosophy.

POLITICAL SCIENCE: 1111, First-Year Writing Seminar (when related to Islamic history or culture as determined by the director of undergraduate studies); 2203, Middle East Politics; 3235, Political Islam; 3272W, The War

in Iraq 2002–2011; 3896, Selected Topics (when related to Islamic politics or culture as determined by the director of undergraduate studies).

RELIGIOUS STUDIES: 1111, First-Year Writing Seminar (when related to Islamic religion or culture as determined by the director of undergraduate studies); 1500, Introduction to Islam; 2461, Islam in Africa; 2471, Religion in Africa; 4551, Islamic Mysticism; 4552, Islam in the Modern World; 4554, The Qur'an and Its Interpreters; 4562, Culture, Religion, and Politics of the Arab World; 4666, Devotional Traditions of South Asia: Hindu, Muslim, Sikh; 4592, Advanced Seminar in Arabic; 4593, Advanced Seminar in Islamic Tradition.

Minor in Arabic Language

18 credit hours. Students complete a required minimum of 18 credit hours from the list below, following one of two tracks. Track A “Foundations and Literature”: 9 credit hours from category I, Grammar and Constructions and 9 credit hours from category II, Literature and Culture. Track B “Full Proficiency”: 12 credit hours from category I, Grammar and Constructions, and 6 credit hours from category II, Literature and Culture. No credit hours will be counted for Arabic 1101 or Arabic 1102.

CATEGORY I, Grammar and Constructions: ARA 2201, Intermediate Arabic I; 2202, Intermediate Arabic II; ARA 3101, Advanced Arabic I; 3102, Advanced Arabic II.

CATEGORY II, Literature and Culture: ARA 3201, Media Arabic; ARA 3301, Arabic of the Qur'an and Other Classical Texts; RLST 4592, Reading Seminar in Arabic Literature; RLST 4593, Reading Seminar in Islamic Tradition.

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 220.

Scientific Computing

DIRECTORS Robert E. Bodenheimer (Computer Science), Thomas J. Palmeri (Psychology), David A. Weintraub (Physics and Astronomy)

Affiliated Faculty

PROFESSORS Ralf Bennartz (Earth and Environmental Sciences), Gautam Biswas (Electrical Engineering and Computer Science), Mario Crucini (Economics), Peter T. Cummings (Chemical and Biomolecular Engineering), Mark N. Ellingham (Mathematics), David Furbish (Earth and Environmental Sciences), Guilherme Gualda (Earth and Environmental Sciences), Kelly Holley-Bockelmann (Astronomy), Shane Hutson (Physics), Gordon D. Logan (Psychology), Terry P. Lybrand (Chemistry and Pharmacology), Clare M. McCabe (Chemical and Biomolecular Engineering), Jens Meiler (Chemistry), Michael I. Miga (Biomedical Engineering), Mark Neamtu (Mathematics), Thomas J. Palmeri (Psychology and Neuroscience), Antonis Rokas (Biological Sciences and Biomedical Informatics), Jeffrey D. Schall (Psychology and Neuroscience), Larry Schumaker (Mathematics), Paul Sheldon (Physics), Kalman Varga (Physics), David A. Weintraub (Astronomy), Robert Weller (Electrical Engineering)

ASSOCIATE PROFESSORS Andreas A. Berlind (Astronomy), Robert E. Bodenheimer (Computer Science), Tony Capra (Biological Sciences), Haoxiang Luo (Mechanical Engineering), Sean Polyn (Psychology and Neuroscience), Jennifer Trueblood (Psychology), Greg Walker (Mechanical Engineering), Steve Wernke (Anthropology)

ASSOCIATE PROFESSOR OF THE PRACTICE Gerald H. Roth (Computer Science)

ASSISTANT PROFESSORS Bennett Landman (Electrical Engineering), Carlos Lopez (Cancer Biology), William Holmes (Physics and Astronomy)

ADJUNCT ASSISTANT PROFESSOR William R. French (Chemical and Biomolecular Engineering)

THE College of Arts and Science and the School of Engineering offer an interdisciplinary minor in scientific computing to help students in the physical, biological, and social sciences as well as engineering acquire the ever-increasing computational skills that such careers demand. Students who complete this minor will have a toolkit that includes programming skills useful for simulating physical, biological, and social dynamics as well as an understanding of how to take advantage of modern software tools to extract meaningful information from small and large data sets.

Computation is now an integral part of modern science. Computer simulation allows the study of natural phenomena impossible or intractable through experimental means. Astronomers studying the formation of massive black holes, neuroscientists studying brain networks for human memory, economists studying effects of regulation on market dynamics, and biochemists studying the three-dimensional structure of proteins are united in many of the computational challenges they face and the tools and techniques they use to solve these challenges.

Students pursuing the scientific computing minor are taught techniques for understanding such complex physical, biological, and social systems. Students are introduced to computational methods for simulating and analyzing models of complex systems, to scientific visualization and data mining techniques needed to detect structure in massively large multidimensional data sets, to high-performance computing techniques for simulating models on computing clusters with hundreds or thousands of parallel, independent processors and for analyzing terabytes or more of data that may be distributed across a massive cloud or grid storage environment.

The scientific computing minor at Vanderbilt is supported by faculty and includes students from a wide range of scientific and engineering disciplines. While the content domain varies, these disciplines often require similar computational approaches, high-performance computing resources, and skills to simulate interactions, model real-life systems, and test competing hypotheses. Scientific computing embodies the computational tools and techniques for solving many of the grand challenges facing science and engineering today.

The minor in scientific computing prepares students for advanced course work that combines computational approaches with a substantive area of science or engineering. It prepares students for directed or independent study with a faculty member on a research project. It prepares students for advanced study in graduate school. It provides skills that will be attractive to many employers after graduation.

The minor in scientific computing is distinct from the minor in computer science. Scientific computing uses computation as a tool to solve scientific and engineering problems in research and application. It is more focused on simulation, numerical techniques, high performance computing, and higher-level methods than the minor in computer science, which is focused on the algorithms, systems, and technologies that enable such methods to be developed and employed.

Details of the minor requirements are provided in the School of Engineering section of the catalog, and are also available at vanderbilt.edu/scientific_computing.

Sociology

CHAIR Larry W. Isaac

DIRECTOR OF UNDERGRADUATE STUDIES David J. Hess

DIRECTOR OF GRADUATE STUDIES Lijun Song

PROFESSORS EMERITI Karen E. Campbell, Jack P. Gibbs, Walter R. Gove, Gary F. Jensen, Ronnie Steinberg

PROFESSORS C. André Christie-Mizell, Daniel B. Cornfield, David J. Hess, Larry W. Isaac, Holly J. McCammon, Jonathan M. Metz

ASSOCIATE PROFESSORS George Becker, Laura M. Carpenter, Shaul Kelner, Richard Lloyd, Evelyn Patterson, Richard Pitt, Mariano Sana, Lijun Song, Zdravka Tzankova

ASSISTANT PROFESSORS Rachel Donnelly, Christy Erving, Alexandre Frenette, Patrick Greiner, Bianca Manago, Joshua Murray, LaTonya Trotter

SENIOR LECTURERS Joe Bandy, Amy Cooter, Rosevelt Noble, Laurie Woods

SOCIOLOGY, the study of social consensus, conflict, and change, offers students a rich and systematic understanding of society and the meaning of social interaction. The department's courses cover a wide range of sociological themes including arts, culture, and religion; cities, states, and political economy; deviant behavior and crime; gender and sexuality; health and the life course; race, ethnicity, and immigration; social movements, politics, and power; environment and population; and work, labor, and occupations. Undergraduate courses in sociology prepare students for graduate work or provide further preparation for a career in law, medicine, business, research, education, the clergy, nursing, social work, or civil service. Two major programs are available. Students may declare only one of the majors offered by the Department of Sociology; double majors within the department are not permitted.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Sociology

Students majoring in sociology are required to complete 33 credit hours of work in sociology (36 credit hours for students in the Honors Research Track). The major consists of five types of courses as listed below: introduction, theory, research skills, core areas, and electives.

Course work for the major is distributed as follows:

Program I (Standard Track)

A total of 33 credit hours as follows:

- | | |
|--|---|
| 1) <i>Introduction:</i> Sociology 1010, 1010W, 1020, or 1020W | 3 |
| 2) <i>Theory:</i> Sociology 3001 | 3 |
| 3) <i>Research Skills:</i> Sociology 3002 (or HOD 2500 for students who double major in sociology and HOD) | 3 |
| 4) <i>Core Areas</i> | 9 |

Students must take at least one course in three of the four core areas listed below. A course cannot be used to satisfy more than one requirement in the major.

Arts and Culture, Institutions and Organizations

Sociology 3201, 3202, 3203, 3204, 3205, 3206, 3213, 3221, 3222, 3223, 3224, 3225, 3231, 3232, 3233, 3615

Health, Environment, Population, and Migration

Sociology 3301, 3302, 3303, 3304, 3306, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3321, 3322; Environmental and Sustainability Studies 4101, 4101W; Medicine, Health, and Society 2310, 2430

Politics, Law, and Conflict

Sociology 3233, 3601, 3602, 3603, 3604, 3605, 3611, 3612, 3613, 3614, 3615, 3616, 3621, 3622, 3623, 3624; Jewish Studies 2560

Race, Ethnicity, and Gender

Sociology 3601, 3616, 3701, 3702, 3703, 3704, 3711, 3722, 3723, 3724; Jewish Studies 2400, 2450

5) *Electives*

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Any 5 sociology courses not used to satisfy the above requirements. SOC 2100 or its equivalent may be counted toward the electives. (Equivalent courses are ECON 1500 or 1510 or MATH 1011 or 2820. Students who double major in sociology and psychology or in sociology and the Peabody majors of human and organizational development, child development, cognitive studies, or child studies may also choose from PSY 2100 or PSY-PC 2110.) Electives may also include only one of the following 1000-level sociology courses: Sociology 1030, 1041, 1041W, or 1111. No other 1000-level sociology course may be counted toward the electives requirement of the major except by permission of the director of undergraduate studies. The Department of Sociology advises students to group their elective sociology courses in a cluster of advanced concentration electives to be selected with the student's adviser.

Program II (Honors Research Track)

A total of 36 credit hours as follows:

The Honors Research Track offers superior majors in sociology the opportunity to pursue intensive work through an independent research project. Students interested in pursuing the Honors Research Track in Sociology should contact the director of undergraduate studies for more information. To be considered for the Honors Research Track in Sociology, a student must have a minimum cumulative GPA of 3.3 and a minimum GPA of 3.3 for courses that count toward the sociology major. Students who are recommended for the program by the director of undergraduate studies will typically begin the program in the first semester of their junior or senior year.

The Honors Research Track in Sociology requires:

- 1) Successful completion of requirements 1–4 in Program I, for a total of 18 credit hours.
- 2) Successful completion of the statistics requirement: SOC 2100 or its equivalent (defined in requirement 5 of Program I).
- 3) Completion of 12 credit hours of elective courses. The statistics requirement is counted toward the electives. Electives may include only one of the following 1000-level sociology courses: Sociology 1041, 1041W, or 1111. No other 1000-level sociology course may be counted toward the electives requirement of the major except by permission of the director of undergraduate studies. If students take more than 6 credit hours of SOC 4981, the additional credit hours (7–12) are counted toward the elective courses.
- 4) Successful completion of at least two semesters of SOC 4981 (Honors Research). The first semester of 4981 (Honors Research) is a 3 credit hour seminar in which students

develop the literature review and research plan for the honors thesis. In the second semester of 4981 (Honors Research), also for 3 credit hours, students must complete the research and data collection, data analysis, and initial write-up of results of the thesis. Students may elect to take a third or fourth semester of 4981 during their senior year, when they may, for example, work on revisions of the project and/or on publication. Students who begin the Honors Track in their senior year may also take more than 6 credit hours of 4981, up to a maximum of 12 credit hours.

- 5) Successful defense of the completed thesis through an oral defense attended by the chair and reader of the thesis; this oral defense typically takes place during the second semester of the student's senior year. In order to earn honors in sociology, students must successfully complete and defend an honors thesis before graduation.

Comprehensive Exam

In order to graduate with a sociology major, students must take a comprehensive exam during their senior year. The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to test the extent to which sociology majors are retaining core aspects of the sociology curriculum.

Program of Concentration in Environmental Sociology

Environmental sociology is the study of the relationship between modern societies and the environment at a variety of scales, from households to global relations. It includes issues such as public understanding of environmental issues, the environment and inequality, environmental social movements and social change, and analysis of environmental reform and adaptation. Environmental sociology is different from environmental science, which is based in the natural sciences, and environmental studies, which includes courses from a wide range of disciplines, including engineering and the humanities. The department's program in environmental sociology includes a solid introduction to sociology and sociological methods as well as foundation requirements in environmental science. The program prepares students for careers in government, the law, management, research and teaching, and the nonprofit sector.

Students majoring in environmental sociology are required to complete 33 credit hours of course work. The major consists of four types of courses: foundation social science courses, foundation environmental science courses, research skills, and environmental sociology courses.

Program I (Standard Track)

A total of at least 33 credit hours as follows:

- 1) *Foundation Courses in Sociology* 6 credit hours
SOC 1020 or 1020W or 1030, SOC 3001
- 2) *Foundation Courses in Environmental Sciences* at least 6 credit hours
Two courses from EES 1510, 1030, 1070, 1080, 1140, 1111,** 2150, 2510,* 3310,* 3220,* 3310,* 4680,* 4750,* 4820;* at least one of which must address climate-related issues (EES 1080, 1140, 2110,* 2150, 2510,* 3310,* 4650,* 4680,* 4820,* or another EES course as approved by the director of undergraduate studies of Environmental Sociology).
*Requires prerequisites. **1111s require permission of the director of Environmental Sociology.

- 3) *Research Skills* 6 credit hours
SOC 2100 (or other statistics course approved by the director of undergraduate studies of Environmental Sociology) followed by or concurrent with SOC 3002 or HOD 2500 for those majoring in HOD.
- 4) *Environmental Sociology Core* 15 credit hours
15 credit hours selected from the following:
SOC 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3321, 3604, 3605, 3881,* 4961;* ENV5 4101, ENV5 4101W
*As approved by the director of undergraduate studies of Environmental Sociology

Program II (Honors Research Track in Environmental Sociology)

A total of at least 36 credit hours as follows:

The Honors Research Track offers superior majors in environmental sociology the opportunity to pursue intensive work through an independent research project. Students interested in pursuing the Honors Research Track in Environmental Sociology should contact the director of undergraduate studies of Sociology for more information. To be considered for the Honors Research Track in Environmental Sociology, a student must have a minimum cumulative GPA of 3.3 and a minimum GPA of 3.3 for courses that count toward the environmental sociology major. Students who are recommended for the program by the director of undergraduate studies of Sociology will typically begin the program in the first semester of their junior or senior year.

The Honors Research Track in Environmental Sociology requires:

- 1) Successful completion of requirements 1 through 3 in the Standard Track.
- 2) At least 12 credit hours from requirement 4 in the Standard Track.
- 3) Successful completion of at least two semesters of SOC 4981 (Honors Research). The first semester of 4981 (Honors Research) is a 3 credit hour seminar in which students develop the literature review and research plan for the honors thesis. In the second semester of 4981 (Honors Research), also for 3 credit hours, students must complete the research and data collection, data analysis, and initial write-up of results of the thesis. Students may elect to take a third or fourth semester of 4981 during their senior year, when they may, for example, work on revisions of the project and/or on publication. Students who begin the Honors Program in their senior year may also take more than 6 credit hours of 4981, up to a maximum of 12 credit hours.
- 4) Successful defense of the completed thesis through an oral defense attended by the chair and reader of the thesis; this oral defense typically takes place during the second semester of the student's senior year. To earn honors in environmental sociology, students must successfully complete and defend an honors thesis before graduation.

Comprehensive Exam

In order to graduate with an environmental sociology major, students must take a comprehensive exam during their senior year. The exam is not graded, and no grade will appear on the student's transcript. The purpose of the exam is to test the extent to which majors are retaining core aspects of the environmental sociology curriculum.

Minor in Sociology

The minor in sociology is intended for those students who want to gain an overview of the discipline and to sample some of the special lines of study in it.

Students are required to complete 18 credit hours of course work inside the department, distributed as follows:

- | | |
|---|----|
| 1. Sociology 1010, 1010W, or 1020, 1020W | 3 |
| 2. Sociology 3001 | 3 |
| 3. Four courses, including at least one from three of the four core areas listed in above major | 12 |

Total credit hours: 18

Licensure for Teaching

Candidates for teacher licensure in sociology at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Course descriptions begin on page 225.

Spanish and Portuguese

CHAIR Andrés Zamora
ACTING CHAIR Benigno Trigo
DIRECTOR OF UNDERGRADUATE STUDIES María Paz Pintané
DIRECTOR OF GRADUATE STUDIES José Cárdenas Bunsen
PROFESSORS EMERITI M. Frånille Bergquist, Susan Berk-Seligson, Victoria A. Burrus, Cathy L. Jrade, C. Enrique Pupo-Walker
PROFESSORS Earl E. Fitz, Edward H. Friedman, Ruth Hill, William Luis, Philip D. Rasico, Benigno Trigo, Andrés Zamora
ASSOCIATE PROFESSORS José Cárdenas Bunsen, Christina Karageorgou-Bastea, Emanuelle Oliveira-Monte
ASSISTANT PROFESSORS Luis F. López González, N. Michelle Murray
MELLON ASSISTANT PROFESSOR Anna Castillo
SENIOR LECTURERS Frances Alpren, José Luis Aznar, Lorraine Catanzaro, Rachel R. Chiguluri, Sarah Delassus, Heraldo Falconi, Victoria Gardner, Chalene Helmuth, Clint Hendrix, Stacey Johnson, Benjamin Legg, Alicia Lorenzo-García, Patrick Murphy, Amarilis Ortiz, Carolina Palacios, María Paz Pintané, Cynthia M. Wasick
SENIOR LECTURER, RETIRED Racquel Rincon

THE Department of Spanish and Portuguese offers a wide range of courses in the language, culture, and literature of Spain and Spanish America and is well known for its program in Portuguese and Brazilian studies. Intensive Elementary Catalan is also offered.

The department offers programs of concentration in both Spanish and Spanish and Portuguese. Majors take courses in language, literature, linguistics, and culture. An interdisciplinary major is available in Spanish and European Studies. Qualified Spanish majors may elect to take graduate courses in their senior year or participate in honors work. Minors in Spanish and in Portuguese are also offered.

The department serves majors from the Center for Latin American Studies and the Max Kade Center for European and German Studies. On the graduate level, the department offers a doctoral program in Spanish and a combination doctoral degree in Spanish and Portuguese.

Many students participate in Vanderbilt programs in Seville, Barcelona, and Palma de Mallorca in Spain; Argentina, Chile, and Brazil in South America; and Cuba and the Dominican

Republic in the Caribbean. Maymesters in Spain and Peru are also offered. Activities organized by the department include lectures, films, symposia, and Brazil Week. The department has a chapter of the national honor society Sigma Delta Pi for students of Spanish. Students are encouraged to apply for living space in the Spanish Hall of McTyeire International House.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Spanish

The major requires 30 credit hours in Spanish courses numbered 3301W and above. The distribution requirements are as follows:

1. *Core requirements:* 3301W, 3302, and 3303. A more advanced composition course may be substituted for 3301W. A more advanced conversation course may be substituted for 3302.
2. *Literature:* 9 credit hours from courses numbered 3835 or 3893 or 4400–4980
3. *Linguistics:* 3 credit hours from courses numbered 3892 or 4300–4360 .
4. *Electives:* 9 credit hours from courses numbered 3320–3835 or 3891–4980. Students may substitute 3 credit hours of a language course in either Portuguese (1103 or higher) or Catalan (1103 or higher) as one elective.

All courses that count toward the major must be taken in Spanish and taken for a letter grade. Up to 3 credit hours from AP/IB may count as 3302. The core courses 3301W and 3303 must be taken on the Vanderbilt campus. (This requirement does not apply to students who transfer to Vanderbilt from other U.S. institutions and have completed equivalent courses at their previous institution.) Students must take Spanish 3301W, 3302, and 3303 in order to participate in most study abroad programs. Students may count toward the major up to 12 credit hours of pre-approved course work from Vanderbilt study abroad programs in Spain or Latin America. Of the total number of credit hours taken abroad, no more than 6 credit hours may count toward the same distribution requirement area. A Maymester abroad course taught by a professor with an appointment in the Department of Spanish and Portuguese does not count against the 12 credit hour limit. Students may count toward elective credit up to 3 credit hours of supervised Independent Study, pre-approved by the director of undergraduate studies, in Vanderbilt study abroad programs in Spain or Latin America; such independent study counts toward the maximum limit of 12 credit hours. Students may transfer up to 9 credit hours of pre-approved course work from non-Vanderbilt study abroad programs.

Honors Program in Spanish

Candidates for honors in Spanish who meet college and departmental requirements must complete 36 credit hours in Spanish courses numbered 3301W and above. Students satisfy the requirements of the 30-credit-hour major in Spanish, in which one of the required literature courses is either the undergraduate seminar, Spanish 4980 (3 credit hours), which may be taken during either the junior or senior year, or a graduate seminar (course numbered 7000–9520) approved by the adviser to the Honors Program, which may only be taken during the senior year. If Spanish 4980 is not available, it may,

with permission of the adviser to the Honors Program, be substituted by an “enriched” undergraduate literature course in which the instructor assigns outside research and a second or longer term paper.

The remaining 6 credit hours of the honors program consist of a senior honors thesis, which is completed during the senior year as independent study (Spanish 4998–4999) under the direction of a faculty adviser. Candidates must submit a proposal for the thesis to their prospective faculty adviser no later than the second semester of their junior year. The completed thesis must be submitted within the second semester of the senior year (deadlines are available from the department). An oral examination on the thesis and the general area of research, administered by a committee of the department, will follow.

Minor in Spanish

The minor in Spanish requires a minimum of 18 credit hours. The specific requirements are as follows:

- | | |
|--|---|
| 1. 3301W (A more advanced composition course may be substituted) | 3 |
| 2. 3302 (A more advanced conversation course may be substituted) | 3 |
| 3. 3303 | 3 |
| 4. 3 credit hours of advanced Spanish literature chosen from courses numbered from 3835 or 3893 or 4400–4980 | 3 |
| 5. 6 credit hours of electives chosen from courses numbered 3320–3835, 3891–4980 | 6 |

Total credit hours: 18

All courses that count toward the minor must be taken in Spanish and taken for a letter grade. Up to 3 credit hours from AP/IB may count as 3302. The core courses 3301W and 3303 must be taken on the Vanderbilt campus. (This requirement does not apply to students who transfer to Vanderbilt from other U.S. institutions and have completed equivalent courses at their previous institution.) Students must take Spanish 3301W, 3302, and 3303 in order to participate in most study abroad programs. Students may count toward the minor up to 6 credit hours of pre-approved course work from Vanderbilt study abroad programs in Spain or Latin America. A Maymester abroad course taught by a professor with an appointment in the Department of Spanish and Portuguese does not count against this limit. Students may transfer up to 3 credit hours of pre-approved course work from non-Vanderbilt study abroad programs.

Minor in Portuguese

The minor in Portuguese consists of a minimum of 15 credit hours. The specific requirements are as follows:

- | | |
|---|---|
| 1. Portuguese 2203 (Intermediate Portuguese; a more advanced language course may, subject to approval by the department, be substituted) | 3 |
| 2. One of the following two courses: Portuguese 3301 (Portuguese Composition and Conversation) or Portuguese 3302 (Brazilian Pop Culture) | 3 |
| 3. Portuguese 3303 (Introduction to Luso-Brazilian Literature) | 3 |

4. At least one of the following two courses: Portuguese 4420 (Brazilian Literature through the Nineteenth Century) or Portuguese 4425 (Modern Brazilian Literature)

At least 3 additional credit hours selected from among the courses listed below (or a graduate course numbered 7000–9520 for qualified seniors; procedures may be found in the Academic Regulations section of the *Undergraduate Catalog*).

Portuguese 4350 (Brazilian Culture through Native Material), 4420 (Brazilian Literature through the Nineteenth Century), 4425 (Modern Brazilian Literature), 3892 (Special Topics in Portuguese Language, Literature, and Civilization)

3

3

Total credit hours: 15

Program of Concentration in Spanish and Portuguese

This major focuses on the two dominant languages (Spanish and Portuguese) of the Iberian Peninsula and Latin America and their literatures and cultures. The basic requirement for this major is a minimum of 33 credit hours in Spanish and Portuguese. The distribution is as follows:

1. Core requirements of Spanish 3301W, 3302, and 3303; Portuguese 2203, 3301 (or 3302), and 3303.
2. At least two Spanish courses numbered between 3320–3330, 3355–3385, 4400–4980 or 3835, 3891 or 3893.
3. At least two of the following Portuguese courses: 3892, 4350, 4420, 4425, 7070, 7071, and 9520.
4. One additional elective to be chosen from the courses listed under area 2 and 3 above.

A student who studies abroad may be able to substitute similar culture or literature courses with the permission of the director of undergraduate studies.

Program of Concentration in Spanish and European Studies

Students pursuing the interdisciplinary major in Spanish and European studies combine their focus on Spanish language and literature with a study of modern Europe in its political, economic, and cultural diversity. Students may elect this interdisciplinary major, which requires a minimum of 33 credit hours of course work. A semester of study abroad in Spain is recommended. Course work for the major is distributed as follows:

Spanish (21 credit hours)

Spanish language and literature core courses (9 credit hours): 3301W, 3302, and 3303 (a more advanced composition course may be substituted for 3301W; a more advanced conversation course may be substituted for 3302).

Spanish culture and civilization and/or Spanish literature (12 credit hours): 3320, 3325, 3355, 3360, 3365, 4400, 4405, 4410, 4415, 4440, 4445, 4455, 4470, 4620, 4640, 4670, 4690, or, subject to a variance, any other courses dealing with Spain or Iberian issues.

Students may substitute 3 credit hours of a language course in either Portuguese (1103 or higher) or Catalan (1103 or higher) as an elective.

European Studies (12 credit hours)

European Studies core courses (3 credit hours): EUS 2201 or 2203

European Studies courses or alternative topical courses as approved by major adviser (6 credit hours)

Senior Tutorial (3 credit hours): EUS 4960 or equivalent course in Spanish

Teacher Licensure

Candidates for teacher licensure in Spanish at the secondary level should refer to the chapter on Licensure for Teaching in the Peabody College section of this catalog.

Catalan

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 161.

Portuguese

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language.

Course descriptions begin on page 217.

Spanish

Entering students should consult their advisers or the director of undergraduate studies at the Department of Spanish and Portuguese for advice on placement. Students who have not studied Spanish in high school should begin their studies at Vanderbilt in Spanish 1100. Students with high school Spanish on their records must present a department placement test score in Spanish to be placed correctly. (See department website for more details.) Students with a score of 4 or 5 on the AP Spanish Language or Literature examination should register for Spanish 3301W (Intermediate Spanish Writing).

Note: Students may not earn credit for an introductory language course if they previously have earned credit for a higher-level course taught in that same language. In addition, students may not earn credit for an intermediate-level language course if they previously have earned credit for a higher-level course taught in that same language. Students who have earned Advanced Placement or International Baccalaureate credit in a foreign language will forfeit the test credit if they complete a lower-level course taught in that same language. Exception: Students who take Spanish 3301W do not forfeit credit for Spanish 3302.

Course descriptions begin on page 228.

Teacher Education

STUDENTS interested in preparing for licensure as early childhood, elementary, special education, or secondary school teachers should meet with Associate Dean Roger Moore, College of Arts and Science, as soon as possible to initiate discussion with appropriate personnel in teacher education.

Specific information on program requirements will be found under Licensure for Teaching in the Peabody College section of this catalog.

Early Childhood and Elementary Education

Students interested in preparing to teach early childhood or elementary school pupils major in a single discipline or an interdisciplinary program in the College of Arts and Science as well as in education at Peabody College.

Secondary Education

The College of Arts and Science and Peabody College offer teacher education programs leading to secondary school teacher licensure in the following fields:

- English
- Mathematics
- Science (Biological Sciences, Chemistry, Earth and Environmental Sciences, Physics)
- Social Studies (History and Political Science). Economics, Psychology, and Sociology may become additional endorsement areas for students who also have selected history or political science as an endorsement area.

Students major in an academic discipline in the College of Arts and Science and complete a second major in education at Peabody College.

Special Education

Students interested in preparing to teach children with special needs major in special education at Peabody College. Areas of teacher licensure available are mild and moderate disabilities, multiple and severe disabilities, visual impairment, hearing impairment, and early childhood special education.

Theatre

CHAIR M. Leah Lowe
 DIRECTOR OF UNDERGRADUATE STUDIES Phillip N. Franck
 PROFESSORS EMERITI Robert A. Baldwin, Jon W. Hallquist,
 Terryl W. Hallquist, Cecil D. Jones Jr.
 ASSOCIATE PROFESSORS E. Christin Essin, Phillip N. Franck,
 M. Leah Lowe
 ASSISTANT PROFESSOR Elizabeth Cizmar
 PRINCIPAL SENIOR LECTURERS Alexandra Sargent Capps,
 Matthew D. Stratton
 WRITER IN RESIDENCE Krista Knight

VANDERBILT'S Department of Theatre offers a vital center of innovative scholarship, teaching, creative expression, and exploration. The study of theatre introduces students to a major form of literature and performing arts, thereby developing

a familiarity with one of the greatest cultural heritages and an understanding of human behavior and civilization as it is reflected through the ages. Theatre uniquely shapes perceptions about life into an active experience. Because this process encourages critical thought and discussion, the department provides a singular and important aspect of a liberal arts education through its production season and course work. Viewed as a practical extension of the department's curriculum, plays are produced in Neely Auditorium, a laboratory where students learn to form creative expressions as well as to evaluate and to critique them.

On one level, the Department of Theatre helps the general liberal arts student develop reasoned standards of criticism and an understanding of the intimate correlation between the theatre and the society which it reflects, preparing Vanderbilt graduates for successful careers in theatre as well as other fields of interest. For its majors and minors, the department provides a more detailed and specialized study of the major components of theatrical endeavor, allowing opportunities for the practical application of course work in the productions staged at the theatre. In many cases, the department helps to prepare students with professional aspirations as either artists or teachers in their specialized area of interest.

Work in the productions at Vanderbilt reflects the instruction that occurs in the classroom at Neely Auditorium. Because the academic endeavors require hands-on, project-oriented teaching, students can expect small-to-medium class enrollments and numerous opportunities for exposure to faculty instruction outside of the classroom. The department's curriculum includes courses in acting, directing, design, technology, dramatic literature, theatre history and criticism, and playwriting. Students can either major or minor in theatre at Vanderbilt. The major consists of a minimum of 35 credit hours that include courses in acting, directing, dramatic literature, theatre history/criticism, design, technology, and stagecraft. For the minor, students select one of three more narrowly focused tracks (dramatic literature/theatre history, acting/directing, or design/technology) and complete a minimum of 18 credit hours of course work.

Students may also learn about theatre by studying with Coe Artists, distinguished guest-artist professionals brought to campus each year to benefit majors, minors, and those with a serious interest in theatre. Weeklong master classes are taught by playwrights, actors, designers, and directors from the professional world of theatre, television, and film. Previous Coe Artists have included such celebrated artists as Tim Miller, Sojourn Theatre, Lisa D'Amour, Karl Malden, Olympia Dukakis, Fiona Shaw, the Living Theatre, and Actors from the London Stage. The Department of Theatre also offers a monthlong program of study of theatre in London during the May session. Students have the opportunity to witness a variety of theatrical experiences, as well as hear professional artists speak as guest lecturers.

Theatre majors and minors from Vanderbilt have entered a wide variety of professions and post-graduate opportunities after they graduate. Those seeking employment in the fields of theatre, film, radio, or television have secured positions at appropriate graduate schools or internships with professional companies immediately following their study at Vanderbilt. Many distinguished professional theatre companies across the nation, television networks in New York, and the film industry in Los Angeles include Vanderbilt University Theatre alumni as writers, actors, designers, technicians, dramaturgs, and stage managers. In addition, many Vanderbilt theatre students have secured teaching assignments at either the college/university level (once they have completed appropriate post-graduate

education) or the elementary/secondary education level.

The practice of theatre requires individuals to participate through a variety of means: to collaborate with all other members of a production team; to express elements of abstract thought in both oral and written form; and to develop the critical ability to assess and analyze aesthetic choices. As a result of these experiences, recent graduates have also pursued careers in such widely diverse fields as law, medicine, psychology, and business.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Theatre

Students majoring in theatre are required to complete a minimum of 35 credit hours in courses concerned exclusively with theatre and dramatic literature. Required courses are 1010/1010W or 1111, 1711, 1611 2651, and 4961; two courses chosen from 2201, 2202W, 2204, and 4201; one course chosen from 3721, 3761, and 3741; additional 9 credit hours chosen from other theatre courses above the 2000 level.

Honors Program

The Honors Program in Theatre is designed to afford superior students the opportunity to pursue more intensive work within their major field. Admission requirements are: (1) completion of junior year; (2) completion of at least 21 credit hours of the theatre major; (3) 3.3 minimum cumulative GPA and a 3.5 minimum GPA in courses counting toward the major. Candidates who successfully complete the following requirements may graduate with honors or highest honors: (1) maintain the aforementioned GPA throughout the senior year; (2) complete all requirements of the theatre major; (3) complete 6 credit hours of independent research 4998–4999 (Honors Research and Thesis) normally taken during the senior year; (4) write an honors thesis to be completed by the second semester of the senior year; (5) successfully complete an honors oral examination on the topic of the thesis.

Minor in Theatre

A minor in theatre requires a minimum of 18 credit hours of courses in the department. All students minoring in theatre must complete 1010/1010W or 1111 and 4201. In addition, each student must complete one of the following three clusters: Dramatic Literature/Theatre History: 2201, 2202W, 2204, and 3201W; Acting/Directing: 1611, 3611, 4611, and 2651; Design/Technology: 1711 is required; choose three from 3721, 3761, 3741, or 3781.

Course descriptions begin on page 230.

Women's and Gender Studies

DIRECTOR (On Leave) Katherine Crawford
 INTERIM DIRECTOR Elizabeth R. Covington
 ASSOCIATE DIRECTOR Stacy C. Simplican
 DIRECTOR OF UNDERGRADUATE STUDIES Elizabeth R. Covington
 PROFESSOR EMERITA Charlotte Pierce-Baker
 PROFESSORS Dana Nelson, Kelly Oliver
 ASSISTANT PROFESSOR Danyielle Valentine
 PRINCIPAL SENIOR LECTURER Julie Fesmire
 SENIOR LECTURERS Elizabeth R. Covington, Rory Dicker (Women's Center), K. Allison Hammer, Kristen Navarro, Stacy C. Simplican

Affiliated Faculty

PROFESSORS Brooke A. Ackerly, Ellen T. Armour, Houston A. Baker (English), Robert F. Campary (Asian Studies), Ellen W. Clayton (Pediatrics, Law), Katherine B. Crawford (History), Cynthia J. Cyrus (Blair), Kate Daniels (English), Colin Dayan (English), Bonnie J. Dow (Communication Studies), Lynn E. Enterline (English), Jennifer Fay (Cinema and Media Arts), Gerald Figal (History and Asian Studies), Earl E. Fitz (Portuguese), Vivien G. Fryd (History of Art), Tracey E. George (Law), Derek M. Griffith (Medicine, Health, and Society), Barbara Hahn (German), Joni L. Hersch (Law), Sarah Igo (History), Vera M. Kutzinski (English), Amy-Jill Levine (New Testament Studies), Jonathan M. Metz (Medicine, Health, and Society), Holly J. McCammon (Sociology), Thomas A. McGinn (History), Bonnie J. Miller-McLemore (Religion, Psychology, and Culture), Lynn T. Ramey (French), Laurel C. Schneider, Kathryn L. Schwarz, Mark L. Schoenfield (English), Tracy D. Sharpley-Whiting (African American and Diaspora Studies, French), John M. Sloop (Communication Studies), Hortense J. Spillers (English), Cecelia Tichi (English), Benigno L. Trigo (Spanish and Portuguese), Emilie Townes (Divinity), Arleen M. Tuchman (History), Holly A. Tucker (French and Italian), Edward N. Wright-Rios (History)
 ASSOCIATE PROFESSORS Vanessa B. Beasley (Communication Studies), Laura M. Carpenter, Beth A. Conklin (Anthropology), Nathalie A. Debrauwere-Miller (French and Italian), Idit Dobbs-Weinstein (Philosophy), Christin Essin (Theatre), Kathy L. Gaca (Classical and Mediterranean Studies), Teresa A. Goddu (English), Rolanda L. Johnson (Nursing), Scott Juengel (English), Christina Karageorgou-Bastea (Spanish and Portuguese), Shaul J. Kelner (Sociology, Jewish Studies), Claire S. King (Communication Studies), Melanie D. Lowe (Blair), Richard J. McGregor (Religious Studies), Adam S. Meyer (Jewish Studies), Tracy Miller (History of Art and Asian Studies), Catherine A. Molineux (History), Ifeoma C. Nwankwo (English), Emanuelle Oliveira-Monte (Spanish and Portuguese), Bridget E. Orr (English), Richard N. Pitt (Sociology), Nancy B. Reisman (English), Ruth Rogaski (History), Allison H. Schachter (Jewish Studies), C. Melissa Snarr (Ethics and Society), Meike G. Werner (German, Russian and East European Studies)
 ASSISTANT PROFESSORS Candice Amich (English), Gilbert Gonzales (Health Policy), Aimi Hamraie (Medicine, Health, and Society), Jessica Hock (English), Mireille M. Lee (History of Art), Luis Leyva (Math Education), Linda G. Manning (Psychiatry), N. Michelle Murray (Spanish and Portuguese), Monica Park (Classical and Mediterranean Studies), Kimberly Welch (History), Alexis Wells-Oghoghomeh (Religious Studies)
 ASSISTANT PROFESSOR OF THE PRACTICE Sophie Bjork-James (Anthropology),
 PRINCIPAL SENIOR LECTURER Julia Fesmire (English)
 SENIOR LECTURERS Alexandra Sargent Capps (Theatre), Amy Cooter (Sociology), Yollette T. Jones (History), Elizabeth S. Meadows (English), Courtney Muse Peterson (Medicine, Health, and Society), JuLeigh Petty (Medicine, Health, and Society)
 LECTURERS Melinda Brown (Librarian for Inclusion Initiatives), Alexsey Dubilet (English), Amanda M. Kinard (English), Cara Tuttle Bell (Project Safe)
 WRITER IN RESIDENCE Alice Randall (African American and Diaspora Studies)

THE Program in Women's and Gender Studies is an interdisciplinary program that examines gender as a social construct and as a historically variable component of culture that orders human behavior, perceptions, and values. The program teaches its students to reexamine traditional beliefs, to engage in new kinds of research, and to bring a critical perspective to the everyday practices that shape women's and men's lives in the United States and globally. Our courses and instructors pay particular attention to the consequences for women, men, and children of living in a world characterized by profound inequalities. The program also recognizes that race, class, ethnicity, age, sexuality, ability, and nationality are crucial aspects of identity and experience; these are understood to be intersecting and contested features of social life and are examined as such.

Because these aforementioned features of human experience cut across many disciplines, students in the women's and gender studies program achieve a deeper understanding of the complexity and wholeness of human life. In the classroom, as in faculty and student research, our goal is to transform traditional ways of knowing by reaching across epistemological and methodological divisions to foster comprehensive, interdisciplinary perspectives on gender, sexuality, identity, and power in social life. Women's and gender studies not only compels us to recognize the problems and possibilities of the changing times in which we live, but also empowers us to effect change.

The Program in Women's and Gender Studies offers a major and a minor which provide an excellent foundation for students who plan to enter professional schools in law, medicine, and business; for those who pursue advanced degrees in women's and gender studies, the humanities, and social sciences; as well as for those who move into careers in business, government, research, teaching, health and social administration, counseling, journalism, advocacy, and the media.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Program of Concentration in Women's and Gender Studies

The interdisciplinary major in women's and gender studies consists of 30–36 credit hours of course work, distributed at the *Introductory*, *Intermediate*, and *Advanced* levels, as follows:

Introductory-Level Courses (3 credit hours)

Students must take either 1150/1150W (Sex and Gender in Everyday Life) for 3 credit hours or 1160 (Sex and Society), also for 3 credit hours.

Intermediate-Level Courses (24 credit hours)

With the exception of WGS 4960, WGS 1272 and above are intermediate-level courses. WGS 1111 (First-Year Writing Seminar) also counts as an intermediate-level course. Of the required 24 intermediate-level credit hours, students must earn credit for at least one course in each of the following areas: international/global feminism; history/social movements; and sex/sexuality and society. Courses that meet these requirements are listed below. Students may earn up to 6 credit hours for internship training, independent research, and readings: WGS 3881, WGS 3882, or WGS 3883.

Advanced-Level Course (3 credit hours)

Students must earn credit for WGS 4960 (Senior Seminar), generally taken in the second semester of the student's final year.

Honors Program

The Honors Program in Women's and Gender Studies requires 36 credit hours of course work and is designed to afford exceptional students the opportunity to undertake independent research on a topic in feminist and/or gender scholarship in consultation with faculty members. The program is open to all women's and gender studies majors with junior standing who have completed at least 24 credit hours of the major and who have earned a 3.3 cumulative grade point average and a 3.3 grade point average in courses counting toward the women's and gender studies major. Students must be approved for acceptance into the Honors Program by the program director. To graduate with honors in women's and gender studies, students must:

- (a) Complete 36 credit hours of course work;
- (b) Complete the required courses for the major (described above);
- (c) Submit for approval a short description of the Honors project/thesis to the director of the Women's and Gender Studies program, no later than second semester of the junior year;
- (d) Complete 6 credit hours of independent research, 4998 and 4999 (Honors Research and Project), typically during the senior year under supervision of the project adviser. These 6 credit hours count as electives in the 36 credit hours of course work for Honors majors.
- (e) Complete an honors project by the second semester of the senior year; and
- (f) Pass an oral examination on the topic of the Honors project/thesis.

Candidates for honors in women's and gender studies may, with the written permission of the director of the program, substitute one 3000-level course in gender and/or feminist studies for one 2000-level course required for the major.

Information concerning the Honors Program is available from the director of the Women's and Gender Studies program. College regulations governing honors may be found in this catalog under Honors Programs.

Minor in Women's and Gender Studies

The minor in women's and gender studies consists of 15 credit hours of course work, distributed as follows:

Introductory-Level Courses (3 credit hours)

Students must take either 1150/1150W (Sex and Gender in Everyday Life) for 3 credit hours or 1160 (Sex and Society), also 3 credit hours.

Intermediate-Level Courses (9 credit hours)

Students must earn 9 credit hours by completing one course in each of the following areas: international/global feminism; history/social movements; and sex/sexuality and society. Courses that meet these requirements are listed below.

Advanced-Level Course (3 credit hours)

Students must earn credit for WGS 4960 (Senior Seminar), generally taken in the second semester of the student's final year.

Courses approved to fulfill the international/global feminism(s) requirement:

ASIA 2609W (Writing and Gender in Traditional China)
 ENGL 3658 (Latino-American Literature)
 ENGL 3670W (Colonial and Postcolonial Literature)
 ENGL 3742 (Feminist Theory)
 FREN 3223 (The *Querelles des femmes*) [in French]
 FREN 4320 (French Feminist Thought) [in French]
 ITA 3340 (*Famous Women* by Boccaccio)
 PHIL 3007 (French Feminism)
 PSCI 3264W (Global Feminisms)
 SOC 3711 (Women, Gender, and Globalization)
 SPAN 2990 (Images of the Feminine in Spanish Cinema)
 WGS 3201 (Women and Gender in Transnational Context)
 WGS 3281 (Globalization and Policy Making)
 WGS 3610 (Womanism in Global Context)

Courses approved to fulfill the history/social movements requirement:

AADS 2214 (History and Myth: Black Women in the U.S.)
 CMST 3110 (Women, Rhetoric, and Social Change)
 ENGL 3622 (Nineteenth-Century Women Writers)
 HIST 2835 (Sexuality and Gender to 1700)
 HIST 2840 (Sexuality and Gender since 1700)
 HIST 2855 (Women and Gender in the U.S. to 1865)
 HIST 2860 (Women and Gender in the U.S. since 1865)
 ITA 3740 (Gangsters, Lovers, Madonnas, and Mistresses)
 RLST 3930 (Women and Religion)
 RLST 3926 (Ancient Goddesses)
 SOC 3722 (Gender and Society)
 WGS 3246/W (Women's Rights, Women's Wrongs)
 WGS 3250/W (Contemporary Women's Movements)

Courses approved to fulfill the sex, sexuality, and society requirement:

AADS 2104 (Popular Culture and Black Sexual Politics)
 ANTH 3145 (Sexuality, Gender, and Culture)
 CLAS 3100 (Women, Sexuality, and the Family in Ancient Greece and Rome)
 CMST 3720 (Communicating Gender)
 FREN 4322 (Adultery and Transgressions in Literature) [in French]
 HART 3228W (Gender and Sexuality in Greek Art)
 HIST 2240 (Sex Law)
 HIST 2810 (Women, Health, and Sexuality)
 LAS 4550 (Gender, Sexuality and Family in Latin America)
 PHIL 3604 (Gender and Sexuality)
 RLST 1820 (Religion, Sexuality, Power)
 RLST 3225 (Sexuality in the Hebrew Bible and Ancient Near East)
 SOC 3723 (Gender, Sexuality, and the Body)
 WGS 2252 (Sex and Scandals in Literature)
 WGS 2256 (Literary Lesbians)
 WGS 2612 (LGBT Studies)
 WGS 2613 (Compulsory Couplehood)
 WGS 2615 (Transgender Lives in Literature and Film)

Additional courses approved for intermediate-level WGS credit from other departments:

AADS 1111*, AADS 1204, AADS 2214, AADS 4262, CLAS 1111*, CMST 1111*, CMST 2950, CMST 3100, CMST 3890, ENGL 1111*, ENGL 1111.19, ENGL 1230W*, ENGL1260W*, ENGL 3670/W*, ENGL 3674, ENGL 3890/W*, ENGL 3890.01, ENGL 3894/W*, ENGL 3898/W*, FREN 3230, GER 2444, GER 3344, GER 4535, GER 4537, HIST 1111*, HIST 3010, HIST 4960*, HART 2765, HART 3840*, HART 4960*, JS 1111*, MHS 1111*, MHS 3890*, PSCI 2209, PSCI 2236, PSCI 3271, PSCI 3893*, PSY 3705, RLST 1111*, RLST 2220, RLST 4554, RLST 4834, RLST 4938, SOC 3221, SOC 3304, SOC 3603, SOC 3604, SOC 3611, SOC 3616, SOC 3704, SOC 3724, SPAN 3893*, SPAN 4755, THTR 2781, THTR 3741

*With topic approval by the director of undergraduate studies

Course descriptions begin on page 232.

College of Arts and Science Courses

Explanation of Course Numbers and Symbols

1000-level courses are introductory courses primarily taken by freshmen and sophomores.

2000- and higher-level courses are intermediate- or advanced-level courses which typically require some prerequisite. They are primarily intended for sophomores, juniors, and seniors.

Hours are semester hours—e.g., a three-hour course carries credit of three semester hours.

Bracketed figures indicate semester hours credit, e.g., [3].

First-Year Writing Seminars are numbered 1111.

W symbols used in course numbers designate courses in the College of Arts and Science that will meet the AXLE writing requirement.

The AXLE designation in parentheses in each course description indicates which AXLE requirement pertains. For example, (HCA) indicates credit for Humanities and the Creative Arts in AXLE. The designation (No AXLE credit) indicates the course does not satisfy an AXLE degree requirement.

The university reserves the right to change the arrangement or content of courses, to change the texts and other materials used, or to cancel any course on the basis of insufficient enrollment or for any other reason.

It is the responsibility of each student to avoid duplication, in whole or in part, of the content of any courses offered toward the degree. Such duplication may result in withdrawal of credit.

African American and Diaspora Studies

AADS 1001. Commons iSeminar. [Formerly AADS 99] Topics vary. Open only to first-year students. General Elective credit only. [1] (No AXLE Credit)

AADS 1010. Introduction to African American and Diaspora Studies. [Formerly AADS 101] Foundations of African American culture from ancient African history and through contemporary issues in the African American experience and the larger diaspora. The characteristics, developments, and dynamics of diaspora culture in the Americas, with a particular focus on the United States. [3] (P)

AADS 1016. Race Matters. [Formerly AADS 110] Race and racism in the United States and their impact on democratic practices. General intellectual and cultural manifestations of the significance of race and how it influences democratic reform: racial preferences, the prison industrial complex, national security, HIV/AIDS, and elections. [3] (US)

AADS 1108. Making of the African Diaspora. [Formerly AADS 102] 1790 to the mid-twentieth century. Slave politics and abolition, the meaning of freedom after emancipation, and black workers' struggle for democracy and citizenship. Resistance to empire and colonialism. Migration, race and color ideology, religion, and culture. [3] (P)

AADS 1111. First-Year Writing Seminar. [Formerly AADS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

AADS 1204. Diaspora Feminisms. [Formerly AADS 120] Introduction to feminism in multiple diasporic places and communities. Comparison of black feminisms across time and space. [3] (INT)

AADS 1506. Reel to Real: Film Aesthetics and Representation. [Formerly AADS 150] Oppositional cinematic practices of black filmmakers. Hollywood representations of blacks. The theoretical language of film criticism, styles, genres, periods. [3] (P)

AADS 1706. Capoeira: Afro-Brazilian Race, Culture, and Expression. [Formerly AADS 170] Origins of an Afro-Brazilian martial art form. Influence on Brazilian and world culture in the areas of religion, dance, and music. Development as a social protest movement. Intersections of race, gender, class, power, and national identity. [3] (INT)

AADS 1716. The African City: Urban Landscapes on the Page, Screen, and Canvas. Study of African cities north and south of the Sahara through literature, visual and popular cultures, and history. Impact of colonial and postcolonial practices and policies on urban landscapes, urban relationships, and resources. Gendered experiences of the city in fiction, non-fiction, music, art, and film. [3] (INT)

AADS 2104. Popular Culture and Black Sexual Politics. [Formerly AADS 200] Constructed images of black masculinity, femininity, and sexuality in popular culture. Social political hierarchies in society at-large. [3] (HCA)

AADS 2106. African Diaspora: A Problem for Thought. Beginning with the slave trade in Europe to the formation of slave colonies in the Americas. Meaning of diaspora for African subjects in the 18th-19th centuries, and challenges to racism and colonialism in the African Diaspora in the 20th century. [3] (P)

AADS 2148. Blacks in Latin America and the Caribbean. [Formerly AADS 140] Distinctive cultural forms and patterns in the Caribbean basin and Latin America from the sixteenth century to the present. Diverse origins of culture. Slave society's impact on cultural production. [3] (INT)

AADS 2166. African American Influences on Country Music. African and African American aesthetics, instruments, and people. Southern rural folk music in the United States. [3] (US)

AADS 2168. Black Migrations in the African Diaspora. [Formerly AADS 160] The impact of migration in a post-civil rights and post-colonial world. Political tensions, identity politics, and solidarity. Comparative anthropological and sociological narratives on race, culture, and ethnicity. Countries and regions include Democratic Republic of Congo, France, Ghana, Liberia, Tanzania, parts of Asia, and the U.S. [3] (INT)

AADS 2178. Global Africa. [Formerly AADS 165] The globalization of Africa within the context of Arab and European expansion. Historical flash-points and contemporary events. The invention of Africa in literary and political discourses. The geopolitics of aid and development. Africa's relationship with the African diaspora, including modern migrations and debates on the racial and geographic divide between Arab regions north and south of the Sahara. [3] (INT)

AADS 2204. Black Women and the Politics of Blackness and Beauty. [Formerly AADS 207] Competing and contested meanings of beauty and race in the post-black society. The role of traditional and new media in self-expressions and self-understandings of color, body image, hair, and relationships. [3] (HCA)

AADS 2214. History and Myth: Black Women in the United States. [Formerly AADS 221] Complexities of being black and female in the history of the United States. Interrogation of racism, class, sexuality, and sexism. Black women's multifaceted, diverse community roles. [3] (HCA)

AADS 2294. Black Paris – Paris Noir: The African Diaspora and the City of Light. [Formerly AADS 209] The lived experiences, tensions, belonging, and representations of people of African descent who self-identify and are identified as Black or Noir in Paris, France, from the interwar years to the present. Diversity, intergroup relations, and race beyond the United States. Not open to students who have earned credit for AADS 1111 Section 05 without permission. Total credit for this course and AADS 1111

Section 05 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (INT)

AADS 2306. Race, Mixed Race, and "Passing." [Formerly AADS 230] Social, legal constructions and live experiences of race. Phenomenon of "passing" and category of "mixed race" in fiction, film, and landmark court cases. [3] (HCA)

AADS 2356. African Spirits in Exile: Diaspora Religions in the Americas. Use of anthropology, folklore, history, and literature to examine the history of Haitian Vodun, Cuban Santería, Brazilian Candomblé, New Orleans Voodoo, and Trinidadian Orisha worship. Comparisons with Black Christian traditions and supernatural beliefs beyond organized religion. [3] (P)

AADS 2514. Insider/Outsider: The Genealogy of Black LGBTQ Peoples. Interdisciplinary engagement with the history, culture and politics of Black lesbian, gay, bisexual, transgender, and queer (LGBTQ) communities during the 20th and 21st centuries. [3] (P)

AADS 2654. Memoirs and Biographies. [Formerly AADS 265] Biographies and autobiographies as lenses for the study of historical trends and events; development of gender, sexual, and racial identities in subjects. [3] (US)

AADS 2698. African Diaspora Ethnography. [Formerly AADS 269] Anthropology and the construction of race and blackness. Ethnography as method. Notions of roots and routes in the making of African diaspora culture. [3] (INT)

AADS 3016. GOAT: Life, Times, and Politics of Muhammad Ali. "The Greatest Of All Time" (GOAT)—Muhammad Ali—and his impact on U.S. sports history, U.S. political culture, global black freedom struggles, and engagement with the Nation of Islam. Offered on a graded basis only. [3] (US)

AADS 3104W. Soul Food as Text in Text: An Examination of African American Foodways. [Formerly AADS 208W] Distinctions between Southern food and soul food. Soul food as performance and projection of gender and racial identity. Cookbooks as literary artifacts. Soul food in American popular culture, and in African American, Southern, and women's writing. Soul food and community formation. [3] (HCA)

AADS 3178. Colonialism and After. [Formerly AADS 220] African and Caribbean cultures of colonialism. Forms of decolonization and the predicament of neocolonialism from the emergence of capitalism to the present. The historical and anthropological projects of empire and race-making. Causes and strategies of expansion. Forms of representation and knowledge production. Discourses around intimacy, illness and hygiene. Practices of coercion and violence. [3] (INT)

AADS 3204W. African American Children's Literature. [Formerly AADS 204W] From the seventeenth century to the present. Oral and written; fiction and non-fiction. Major works, writers, and genres. [3] (HCA)

AADS 3206. Mystery, Murder, and Mayhem in Black Detective Fiction. [Formerly AADS 202] Detective fiction in America, beginning with Edgar Allan Poe, the founder of the genre in the American literary tradition, and continuing on with such black writers as Chester Himes, Walter Mosley, Paula Wood, and Pamela Thomas-Graham. [3] (HCA)

AADS 3208W. Blacks in the Military. [Formerly AADS 203W] Black participation in American and other wars, from the Revolutionary and Civil wars to ongoing global conflicts. Issues of democracy and freedom. Thematic explorations through film. [3] (P)

AADS 3214. Black Masculinity: Social Imagery and Public Policy. [Formerly AADS 210] Historical and contemporary debates, perceptions, and attitudes. Public policy debates surrounding disparate incarceration rates and sentencing, policing, racial profiling. Social imagery, "down low" homosexuality, criminality, hypersexuality, and athleticism. [3] (SBS)

AADS 3248. Atlantic African Slave Trade. [Formerly AADS 145] Cultural, economic, and social aspects of the African slave trade into the Americas from the 16th to 19th centuries. Transformation of the slave trade as a result of abolition and suppression. [3] (SBS)

AADS 3258. Black Issues in Education. [Formerly AADS 215] Race, ethnicity, gender, class and their relationships to both the broader roles of schooling and education in American society. Historical foundation of edu-

cation for African Americans, educational and socioeconomic inequality, family structures, and social policy initiatives. [3] (SBS)

AADS 3278. Black Europe. [Formerly AADS 275] History and politics of the African Diaspora in Europe. Focus on Britain, France, Germany, the Netherlands, and Scandinavia. European Union debates about social exclusion; race in the European context. [3] (INT)

AADS 3306. Black Detroit. From 1800 to present. Theory and practice of the Black Metropolis focusing on Detroit, Michigan, as a location of African-American community, commerce, and creativity. [3] (HCA)

AADS 3850. Independent Study. [Formerly AADS 289] May be repeated for a total of 6 credits, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of AADS 3850] (No AXLE credit)

AADS 3880. Internship Training. [Formerly AADS 280B] Graded on a Pass/Fail basis only and must be taken concurrently with 3881. These hours may not be included in the minimum number of hours required for the African American and Diaspora studies major. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private institutions on issues relative to the black experience. A minimum of 3 hours of background reading and research will be completed in AADS 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in AADS, and prior approval by the director of Undergraduate Studies in African American and Diaspora Studies of the student's plan are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

AADS 3881. Internship Readings and Research. [Formerly AADS 280A] Readings conducted under the supervision of a member of the African American and Diaspora Studies program and a substantial research paper are required. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private institutions on issues relative to the black experience. A minimum of 3 hours of background reading and research will be completed in AADS 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in AADS, and prior approval by the director of Undergraduate Studies in African American and Diaspora Studies of the student's plan are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3880. [Variable credit: 3-6] (No AXLE credit)

AADS 3890. Special Topics. [Formerly AADS 294A] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

AADS 4104. Soul Food as Text in Text II: An Examination of African American Foodways II. Advanced treatment of African-American foodways. African-American environmental history. Effects of Seventh-Day Adventist and Black Muslim religious practices on African-American foodways. Creative writing of poet Kevin Young. Prerequisite: 3104W. [3] (HCA)

AADS 4126. The Black Classics. Key texts and writers of the African Diaspora, from medieval Africa to the present. Fiction and non-fiction across the disciplines of anthropology, education, history, law, literature, politics, religion, and sociology. [3] (HCA)

AADS 4198. Global Anti-Blackness and Black Power. [Formerly AADS 190] The relationship and relevance of Black Power to anti-blackness in the United States and globally. The systemic marginalization and exclusion of blacks in public life. Their resilience against and resistance to those efforts. [3] (INT)

AADS 4228W. Black Girlhood: History, Performance and Counter-Narratives. Historical and current social, political, and cultural constructions of black girlhood in the United States. Performances in which black girls engage to deconstruct and interrupt these constructions via scholarly works, poetry, film, photography, and novels. [3] (SBS)

AADS 4256. Haiti: Freedom and Democracy. [Formerly AADS 205] The Saint-Domingue Revolution from 1791 to 1803 and the development of

Haiti from 1804 to the present. Haiti in global context; the revolution as a key moment in the Age of Revolution and the formation of the Black International. Historical monographs, novels, poetry, visual culture, and music. [3] (INT)

AADS 4264. Black Diaspora Women Writers. [Formerly AADS 260] Comparative fiction by women from Francophone and Anglophone Africa, the Caribbean, and the United States. Novels of awakening (bildungsroman), themes of exile, home and alienation, identity as well as sexuality, class and color, slavery and colonialism. [3] (HCA)

AADS 4270. Research Methods. [Formerly AADS 270] Collection, management, analysis and interpretation of data for research. Introduction to qualitative computer software programs. [3] (SBS)

AADS 4506. Slavery and Public Memory. [Formerly AADS 240] Systems of African enslavement in the Americas as a subject of debate among popular and academic audiences. Memoirs, oral history, genealogy, literature, film, and other creative production. Public commemoration and tourist-related slavery observances around the diaspora. [3] (SBS)

AADS 4580. The Black Studies Movement. Black Studies and student movements of the 1960s and early 1970s. Intellectual traditions, precedents, and political ideologies of movements. Issues that sparked the call for Black Studies at different college campuses and public school systems. [3] (SBS)

AADS 4851. Special Topics in Humanities. Topics Vary. Literary, philosophical, and cultural texts. May be repeated for credit if there is no duplication in topic. [3] (HCA)

AADS 4852. Special Topics in Social Sciences. Topics Vary. Diverse range of social and political questions, issues, and problems. May be repeated for credit if there is no duplication in topic. [3] (SBS)

AADS 4979. Senior Thesis in African American and Diaspora Studies. [Formerly AADS 299] Senior Thesis in African American and Diaspora Studies. Supervised readings and independent research to produce an interdisciplinary research paper; topic to be selected in conjunction with a faculty member of African American and Diaspora Studies. Open only to seniors. [3] (No AXLE credit)

AADS 4999. Senior Honors Thesis. [Formerly AADS 298] Supervised readings and independent research for honors thesis under supervision of the adviser and another faculty member. Open only to seniors in the Honors Program. [3] (No AXLE credit)

American Studies

AMER 1001. Commons iSeminar. [Formerly AMER 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

AMER 1002. Introduction to American Studies. [Formerly AMER 100] An interdisciplinary approach to American culture, character, and life. Repeat credit for students who have completed 1002W. [3] (US)

AMER 1002W. Introduction to American Studies. [Formerly AMER 100W] An interdisciplinary approach to American culture, character, and life. Repeat credit for students who have completed 1002. [3] (US)

AMER 1111. First-Year Writing Seminar. [Formerly AMER 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

AMER 1200. Introduction to Southern Studies. [Formerly AMER 101] An interdisciplinary approach to southern American culture, character, and life approached from the interrelated perspectives of history and culture (literature, music, religion, images, rituals, material culture). [3] (US)

AMER 1700W. Writing for Social Change. Practice of narrative, non-fiction writing for social change. History of American investigative journalism and scholarship. Interviewing, research, narrative and revision skills. [3] (HCA)

AMER 2100. Sports, Culture, and Society. Multifaceted role of sports in culture and society, past and present. Cross-cultural perspectives on U.S. sports and related practices. [3] (SBS)

AMER 3100. Rhetoric of Social Movements. [Formerly CMST 224] The role of communication in the creation, development, and function of social movements. The analysis of specific rhetorical acts. The study of the arguments, patterns of persuasion, and communication strategies of selected social movements. [3] (US)

AMER 3200. Global Perspectives on the U.S. [Formerly AMER 202] Contemporary and historical views of the U.S. political and cultural presence in the world; comparative nationalisms; emphasis on points of view outside the U.S. [3] (US)

AMER 3830. Serving and Learning. [Formerly AMER 201] Meanings of and motives behind community service in the United States. The process of engagement in meaningful service. Challenges in integrating service with academic coursework. A service-learning course. [3] (P)

AMER 3851. Independent Readings and Research. [Formerly AMER 289A] Independent readings and/or research on approved topics relating to American society and culture. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of AMER 3851 and 3852] (No AXLE credit)

AMER 3852. Independent Readings and Research. [Formerly AMER 289B] Independent readings and/or research on approved topics relating to American society and culture. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of AMER 3851 and 3852] (No AXLE credit)

AMER 3880. Internship Training. [Formerly AMER 280B] Offered on a pass/fail basis only and must be taken concurrently with 3881. Under faculty supervision, students intern in public or private organizations, conduct background research and reading, and submit a research paper at the end of the semester during which the internship training is complete. Background reading and research will be completed in 3881 concurrently with the completion of internship training, 3880; a minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Corequisite: 3881. [Variable credit: 1-6] (No AXLE credit)

AMER 3881. Internship Readings and Research. [Formerly AMER 280A] Under faculty supervision, students intern in public or private organizations, conduct background research and reading, and submit a research paper at the end of the semester during which the internship training is completed. Background reading and research will be completed in 3881 concurrently with the completion of internship training, 3880; a minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Corequisite: 3880. [3-6]. (No AXLE credit)

AMER 3890. Topics in American Studies. [Formerly AMER 240] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (SBS)

AMER 4000. Research Methods Workshop. [Formerly AMER 294] Issues, methodologies, traditions, approaches, and problems in the discipline. Limited to juniors and seniors with preference given to majors and minors. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

AMER 4100. Undergraduate Seminar in American Studies. [Formerly AMER 295] Advanced reading, research, and writing in a particular area of American Studies. Limited to juniors and seniors with preference given to American Studies majors. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 6 credits total for all semesters of AMER 4100] (SBS)

AMER 4960. Senior Project. [Formerly AMER 297] A project conceived, developed, and completed under supervision of the American Studies faculty. Normally open only to senior American Studies majors. [3] (SBS)

AMER 4998. Senior Honors Research. [Formerly AMER 298] Acquisition, reading, and analysis of primary source research material. Open only to senior honors students. [3] (No AXLE credit)

AMER 4999. Senior Honors Thesis. [Formerly AMER 299] Writing an honors thesis under the supervision of the thesis adviser. [3] (No AXLE credit)

Anthropology

ANTH 1001. Commons iSeminar. [Formerly ANTH 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ANTH 1101. Introduction to Cultural Anthropology. [Formerly ANTH 101] The study of diverse cultures in the contemporary world. The ways in which cultures have developed and changed. Intended for students with a general interest in the field of anthropology. [3] (SBS)

ANTH 1111. First-Year Writing Seminar. [Formerly ANTH 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ANTH 1130W. America through the Lens of Disney. Concepts of gender, family, race, and class through a combination of texts and animated films produced by the Walt Disney Company. Impact on contemporary American cultural values. No credit for students who have earned credit for 1111 section 07. [3] (P)

ANTH 1201. Introduction to Archaeology. [Formerly ANTH 104] Archaeological interpretation of global human history from early settled villages through the rise of the first civilizations. Archaeological methods and analysis, interpretive controversies, and cultural heritage. Environment, technology, religion, and human diversity in past cultural transformations. Rise of early cities and states. Repeat credit for students who earned credit for 1201W. [3] (SBS)

ANTH 1201W. Introduction to Archaeology. Archaeological interpretation of global human history from early settled villages through the rise of the first civilizations. Archaeological methods and analysis, interpretive controversies, and cultural heritage. Environment, technology, religion, and human diversity in past cultural transformations. Rise of early cities and states. Repeat credit for students who earned credit for 1201. [3] (SBS)

ANTH 1301. Introduction to Biological Anthropology. [Formerly ANTH 103] Natural selection and evolution of primates and humans. Theories on early human lifeways and behavior. Bioarchaeological and bioanthropological studies of past and present human health and disease. Evaluation of fossil, skeletal, molecular, and artifactual evidence in reconstructing the past. [3] (MNS)

ANTH 1601. Introduction to Language and Culture. [Formerly ANTH 105] The interrelationship between language and culture. Language and thought, language ideologies, discourse, and linguistic and social identities. Culture and language change. [3] (SBS)

ANTH 2101. Theories of Culture. [Formerly ANTH 206, ANTH 3900] Survey of the views of anthropological thinkers, from the late nineteenth century to the present, about the basic attributes of humankind and human culture. Comparison of different ideas of how people create culture and in turn are molded by culture. Repeat credit for students who have earned credit for 3900. [3] (SBS)

ANTH 2102. Problems in Anthropological Theory. [Formerly ANTH 284, ANTH 3901] Seminar in anthropological theory: cultural evolution, cultural history, ethnic relations, cultural ecology, archaeological method and theory, social structure, political organizations, and religious institutions. Repeat credit for students who have earned credit for 3901. [3] (SBS)

ANTH 2105. Race in the Americas. [Formerly ANTH 205] Origins of the concept of race. Comparison of past and present racial ideologies and practices in the United States, Latin America, and the Caribbean. The inter-

section of race with gender, ethnicity, class, nationalism, and colonialism. [3] (P)

ANTH 2106. Culture and Power in Latin America. [Formerly ANTH 210] Survey of native cultures and Spanish and Portuguese heritage. Fundamental traditions, including marriage and the family, the relationship between men and women, racial and ethnic identity, social class, and religion. Peasant communities and contemporary urban life. [3] (INT)

ANTH 2108. Indigenous Peoples of Lowland South America. [Formerly ANTH 249] Native societies of Amazonia, the Orinoco basin, and other forest, savanna, and coastal regions of South America. Ecology, cosmology, social organization, and political relations in historical and contemporary populations. Government policies, human rights, environmentalism, sustainable development, and indigenous activism and advocacy. [3] (SBS)

ANTH 2109. Food Politics in America. [Formerly ANTH 208] The cultural, social, political, and economic contexts of the contemporary food system. Issues of health and nutrition. Land use, ecological relations, food chains, and links to climate change. Ethics of food production, distribution, and consumption. Agricultural policy, immigration, work conditions, animal welfare, and local economies. Roles of citizens and consumers. Rise of movements seeking sustainable alternatives. [3] (US)

ANTH 2110. Gender and Cultural Politics. [Formerly ANTH 266] Cross-cultural comparison of women's roles and status in western and non-Western societies. Role of myths, symbols, and rituals in the formation of gender identities and the politics of sexual cooperation, conflict, and inequality. Case studies from Africa, the Middle East, Europe, North and South America, Asia, and Melanesia. Serves as repeat credit for ANTH 3145. [3] (P)

ANTH 2113W. Food, Identity, and Culture. Food in Western and non-Western cultures. Food, power, and the making of social beings. Taboos, cultural preferences, and sensory perceptions. Role of eating in social categories, boundaries, and the creation of self and other. Food fashion, globalization, and food in the media. [3] (INT)

ANTH 2114. Above and Below the Surface: The Caribbean between Climate Change and Tourism. Caribbean islands, history, tourism, and ecology. Human-environment interactions. Under water and above water ecologies; Scuba diving and environmental research. Development of interdisciplinary critical thought. Applied research. [3] (INT)

ANTH 2120. Sports, Culture, and Society. Multifaceted role of sports in culture and society, past and present. Cross-cultural perspectives on U.S. sports and related practices. [3] (SBS)

ANTH 2130. Global Infrastructure and Everyday Life. Relations between infrastructure and society around the world, past and present. Analysis of large technical systems as sites of cultural meaning, political struggle, and everyday social interaction. Water, energy, communication, and transportation networks in Africa, Asia, and the Americas, with an emphasis on Latin America. Offered on a graded basis only. [3] (INT)

ANTH 2150. Urban Ecology. Environmental conditions and consequences of human and non-human life processes in cities through history. Transformations of landscapes, food systems, social inequality, and built environments. Origins of cities, gentrification, urban planning, green activism, and environmental justice. Long-term perspectives on climate change, political ecology, environmental history, green politics, and prospects for sustainability. [3] (SBS)

ANTH 2160. Creating Community. [Formerly ANTH 3160; 222] Creation, maintenance, and transformation of communities through time. Community as a village or settlement, and as an "imagined" or virtual aspect of social identity. Behaviorist, interactionist, discursive, and identity-oriented anthropological approaches to community. Community organization and the built environment. Ancient and modern case studies. [3]

ANTH 2160W. Creating Community. Creation, maintenance, and transformation of communities through time. Community as a village or settlement, and as an "imagined" or virtual aspect of social identity. Behaviorist, interactionist, discursive, and identity-oriented anthropological approaches to community. Community organization and the built environment. Ancient and modern case studies. Serves as repeat credit for either 2160 or 3160 Anthropologies and Archaeologies of Community. [3] (SBS)

ANTH 2211. Archaeology. [Formerly ANTH 211] An introduction to the methods used by archaeologists to study the nature and development of prehistoric societies. Approaches to survey, excavation, analysis, and interpretation are explored through lectures, case studies, and problem assignments. [3] (SBS)

ANTH 2214. Art and Architecture in the Ancient Americas. [Formerly ANTH 257] Visual arts and built environments in Mesoamerican and South American civilizations before European contact. Sacred, cultural, and historical influences on building traditions and iconography. [3] (INT)

ANTH 2220. Human Landscapes. [Formerly ANTH 282] Human-environment interactions in the formation of landscapes and settlement systems. Uses of archaeology, cultural anthropology, and cross-cultural comparison to understand social space, sacred landscapes, urban plans, and historical ecology. Methods of interpretation through quantitative, social, and symbolic analysis. Repeat credit for students who earned credit for 2220W. [3] (SBS)

ANTH 2220W. Human Landscapes. Human-environment interactions in the formation of landscapes and settlement systems. Uses of archaeology, cultural anthropology, and cross-cultural comparison to understand social space, sacred landscapes, urban plans, and historical ecology. Methods of interpretation through quantitative, social, and symbolic analysis. Repeat credit for students who earned credit for 2220. [3] (SBS)

ANTH 2221. Old World Archaeology. [Formerly ANTH 217] Ancient Cultures of the Old World. Archaeology of the Near East, Africa, Asia, and Oceania. The origins of the great civilizations of Egypt and Mesopotamia. The beginnings of cities, agriculture, trade, and empires in light of recent archaeological discoveries. [3] (INT)

ANTH 2222. North American Archaeology. [Formerly ANTH 229] The origins of native North American culture. Migration from Asia, early hunters and gatherers, and the extinction of ancient fauna. Evolution of social complexity, ecological adaptations, and prehistoric interaction as seen in the archaeological record of the continent. [3] (US)

ANTH 2223. Native North Americans. [Formerly ANTH 214] Indian societies of North America; their archaeological origins, development, and changing adaptation to white society. [3] (US)

ANTH 2225. Climate Change, Collapse, and Sustainability in History. The Holocene until 1600 AD. Archaeological perspectives on human society and relation to the environment over time. Historical ecology, anthropogenic climate change, domestication, colonial ecosystems, environmental justice. Case studies of cultures and peoples: Maya, Easter Island, Andes, Norse, American Southwest. Application of ancient innovations to address present concerns. [3] (P)

ANTH 2227. Food in the Ancient World. Development of agriculture from around 8,000 BCE to the contact between Old and New Worlds in 1492. Role of foodways in human societies and impact on historical and environmental change. Integration of foodways with social and cultural systems such as gender, identity, ideology, and trade. Elements of historical cuisines, including cooking techniques, meat, and alcohol. Excursions to local sites of agricultural, archaeological, and food-related relevance. [3] (SBS)

ANTH 2229. Religious Sites Across the Ancient World. Architecture and sacred spaces from the Paleolithic period to the medieval world in ancient Europe, Asia, Africa, the Americas, and Oceania. The role of religious sites in pre-modern societies. Diversity and commonalities in religious sites worldwide. Relationship to the natural environment. Cultural heritage and the politics of ancient religious sites in the present. [3] (SBS)

ANTH 2230. South American Archaeology. [Formerly ANTH 252] From 12,000 years ago to the present. Archaeology, ethnohistory, and ethnography. [3] (SBS)

ANTH 2231. Ancient Andean Civilizations. [Formerly ANTH 248] Introduction to the archaeology and peoples of ancient South America. Early hunters and gatherers, origins of agriculture and urbanism, and the rise and fall of the Huari and Inca empires. [3] (INT)

ANTH 2242. The Archaeology of Ancient Maya Civilization. [Formerly ANTH 213] Case study in cultural evolution. Archaeological evidence and social theory on the enigmatic origins, complex nature, and sudden col-

lapse of the ancient Maya civilization. Repeat credit for students who have earned credit for 2242W. [3] (INT)

ANTH 2242W. The Archaeology of Ancient Maya Civilization. Case study in cultural evolution. Archaeological evidence of and social theory on the enigmatic origins, complex nature, and sudden collapse of the ancient Maya civilization. Repeat credit for students who have earned credit for 2242. [3] (INT)

ANTH 2250. Contemporary Middle East and Kurdistan. From Ottoman and Safavid empires to Syria, Turkey, Iran, and Iraq. Kurds, Kurdish history, and the Middle East. Nationalism, Kurdish ethnicity, and uprisings; Kurdish politics across four nation-states. Kurdish community in Nashville. [3] (INT)

ANTH 2342. Biology of Inequality. [Formerly ANTH 242] Biological and health consequences of racial and social inequalities. Psychosocial stress and measurement of its health impact. Effects on disease and precursors to disease. Measures of molecular biology, such as epigenetics and gene expression. Biomarkers of inflammation, cardiometabolic health, and immune function. [3] (SBS)

ANTH 2370. Death and the Body. [Formerly ANTH 267] Cross-cultural study of death rituals. Mortuary archaeology and anthropology of death and the body. Biological and social perspectives on the corpse and living body, and their treatment in ritual and everyday life. The body as biological specimen and social artifact. Nature of beauty, body modification, and adornment. [3] (SBS)

ANTH 2371. Reading the Bones: Bioarchaeology and Forensic Studies in the Peruvian Andes. Maymester: Two weeks on campus followed by field and lab work in rural Peru. Analysis of archaeological mummies and skeletons. Bioarchaeology and forensics. Archaeological site visits and museum tours in Lima and Arequipa. [3] (INT)

ANTH 2375. Making Racism Visible: Media and Civil Rights from MLK to Black Lives Matter. African American, American Indian, and intersectional racial justice movements from 1950 to present. Role of mass media, documentary film, and social media in political struggles for racial justice in the United States. [3] (P)

ANTH 2400. Public Health, Language, Media, and Risk Management. Role of language in the politics and ethics of expert, government, and community stakeholder responses to epidemics, environmental pollution, and natural disasters. Theory and case studies of communication in U.S. and global crises. Uses of science, narrative, and metaphor in formation of health policy and health inequalities based in race, ethnicity, sexuality, and geographic marginalization. [3] (P)

ANTH 2601. Introduction to Linguistics. [Formerly ANTH 201] Systematic study and analysis of human language. Formation of language sounds, sound systems, the structure of words, the structure of sentences, meaning, language change. Data from diverse languages of the world. [3] (SBS)

ANTH 2602. Anthropological Linguistics. [Formerly ANTH 203] An introduction to the study of language in its anthropological context. Language and culture, the structure of symbolic systems, vocabulary as a guide to the ways societies classify their universe. Linguistic analysis as a tool for ethnographic investigation. [3] (SBS)

ANTH 2603. Comparative Writing Systems. [Formerly ANTH 219] The origins, development, and social uses of writing in the ancient Middle East, Mediterranean, and Mesoamerica. Decipherments of hieroglyphic systems. Literacy, historiography, and cross-cultural translation. [3] (HCA)

ANTH 3120. Sociocultural Field Methods. [Formerly ANTH 275] Research design and proposal writing, access to data, ethical issues, sampling techniques, interviewing questionnaire design and question writing, data analysis. [3] (SBS)

ANTH 3121. Global Wealth and Poverty. [Formerly ANTH 209] The production of inequality. How wealth is accumulated, lost, exchanged, and displayed; how poverty is created, endured, and overcome. Explanations in terms of luck, hard work, immorality, occult forces, and public policies. Case studies. [3] (P)

ANTH 3122. The Anthropology of Globalization. [Formerly ANTH 232] Perspectives on globalization based on ethnographic case studies. The impact of new technologies on native cultures; different cultural meanings of global commodities; creation of new diaspora cultures; effects of neoliberal reforms on local economies; ethnic movements and terror networks. [3] (INT)

ANTH 3125. Public Scholarship Practicum in Community Research. Theory and methods for publicizing research to policy makers, organizations, and the public. Uses of media. Communicating research in civil rights; environmentalism; and advocacy on gender, sexuality, health, and religion. Translating original scholarship into pieces for newspapers, blogs, websites, video resources, and public presentations. Prior research experience is expected. Consent of instructor is required. [3] (No AXLE credit)

ANTH 3130. Andean Culture and Society. [Formerly ANTH 246] Historical and archaeological background, languages, economy, environment, and cultural adaptation of Andean peoples. Spanish and native American heritage. Religion, family structure, political organization, contemporary social issues, and economic background. Urban and rural traditions, social movements, and change. [3] (SBS)

ANTH 3132. Social Movements. [Formerly ANTH 225] Collective action, past and present. Class- and identity-based movements, transnational activism, and networks. The early U.S. labor movement; 1960s gay, women's and civil rights movements. Global struggles for social justice. [3] (INT)

ANTH 3133. Political Anthropology: States and Their Secrets. [Formerly ANTH 224] Development, workings, and techniques of the ancient and modern state. Bureaucracy, state secrecy, diplomacy, organization of warfare, surveillance. Anthropological theories of power, state formation, nationalism, authority, influence, and coercion. Case studies of atrocities, disclosure of secrets, and whistleblowing. Ethics and responsibility in complex power structures. [3] (SBS)

ANTH 3134. Human Rights of Indigenous Peoples. [Formerly ANTH 227] Major concepts and legal frameworks for indigenous self-governance, cultural rights, and environmental stewardship. Local and transnational indigenous rights movements. [3] (P)

ANTH 3135. Development, Social Enterprise, Social Justice. Theories of economic and human development. Multidimensional approaches to poverty and well-being. Roles of inequality, discrimination, and social justice. Practical focus on social entrepreneurship in international context. [3] (P)

ANTH 3138. Global Food Politics. Ecological, political, economic, and cultural dynamics in the world food system. Historical and contemporary agricultural methods. Energy, land use, and climate change. Public health and nutrition. Hunger, food scarcity, and biotechnologies. Commodity chains and labor conditions. Movements for food security, food sovereignty, fair trade, and consumer information. [3] (INT)

ANTH 3140. Myth, Ritual, Belief: The Anthropology of Religion. [Formerly ANTH 226] Cross-cultural survey of religious and ritual beliefs in light of theories of religion. Topics include sacrifice, myth, witchcraft, divination, religious change, and millenarian movements. [3] (HCA)

ANTH 3141. Anthropology of Healing. [Formerly ANTH 250] Ritual, symbols, belief, and emotion in health, illness, and therapeutic processes. Practices and politics of healing in western and non-western societies, including shamanism, faith healing, ecstatic religious experience, alternative medicine, and biomedicine. Mind-body interactions, medical pluralism, relations between patients and healers, and implications for improving medical care. [3] (P)

ANTH 3143. Medical Anthropology. [Formerly ANTH 240] Biocultural aspects of human adaptations to health, disease, and nutrition. Non-Western medical and psychiatric systems. Effects of cultures on the interpretation, diagnosis, and treatment of illness. Case studies from Africa, Oceania, Latin America, and the contemporary United States. [3] (SBS)

ANTH 3144. Politics of Reproductive Health. Reproductive health politics, with focus on the United States. Role of broader social, economic, and cultural concerns in diverse positions and public debates. How sexuality,

race, class, gender, and disability shape experiences of conception, pregnancy, childbirth, kinship, and new medical technologies. [3] (P)

ANTH 3145. Sexuality, Gender, and Culture. Theories and case studies of sexuality and gender in Western and non-Western societies. Cross-cultural perspectives on how class, race, ethnicity, culture, and power influence sexual norms and gender roles. Performativity; masculinity and femininity; kinship; religion and sexuality. Serves as repeat credit for ANTH 2110. [3] (P)

ANTH 3150. Cognitive Anthropology. [Formerly ANTH 262] Methods and approaches in linguistics and cognitive sciences. Exploration of culture and thought, and how culture affects our ways of reasoning, thinking, and behavior. Repeat credit for students who completed 3150W. [3] (SBS)

ANTH 3150W. Cognitive Anthropology. Methods and approaches in linguistics and cognitive sciences. Exploration of culture and thought, and how culture affects our ways of reasoning, thinking, and behavior. Repeat credit for students who completed 3150. [3] (SBS)

ANTH 3161. Colonial Encounters in the Americas. [Formerly ANTH 231] Theoretical discussion of colonialism as a sociocultural process. Comparative colonialism in pre- and post-Hispanic contexts. Methodological consideration of archaeological and archival analyses and their complementary epistemological statuses. Pan-American case studies. [3] (SBS)

ANTH 3162. Material Culture of New World Slavery. Enslaved Africans' lives in the New World from an archaeological perspective. Housing, artifacts, health, religion, and resistance in North America, South America, and the Caribbean. Serves as repeat credit for students who earned credit for ANTH 3890-01 in Fall 2014. [3] (SBS)

ANTH 3200. Ancient Cities. [Formerly ANTH 216] Comparative examination of early cities in the Old World and pre-Columbian America. Analysis of social and economic processes supporting preindustrial urbanism. Role of geography, ideology, trade, and settlement systems in the rise of early urban societies. [3] (SBS)

ANTH 3202. The Collapse of Civilizations. [Formerly ANTH 215] Causes of the decline or collapse of complex societies. Old World and New World examples. Historical, anthropological, and paleoecological theories and controversies. [3] (P)

ANTH 3240. Ancient Mesoamerican Civilizations. [Formerly ANTH 212] Development of pre-Hispanic civilization in Mesoamerica from the beginnings of village life to the rise of the great states and empires: Olmec, Maya, Toltec, and Aztec civilizations. [3] (INT)

ANTH 3241. The Aztecs. [Formerly ANTH 247] Origins of the Aztec peoples of central Mexico and their culture; history and structure of the Aztec empire; pre-Columbian social, political, and economic organization; warfare and religion; the Spanish conquest; colonial society in central Mexico; ethno-graphic study of modern descendants of the Aztecs. [3] (INT)

ANTH 3243. Ancient Maya Gods and Rulers. [Formerly ANTH 281] Politics and religion in Classic Maya culture, 100-1000 C.E. Sources and symbols of power, ritual life, and metaphysical underpinnings of hierarchy and cosmology. Relationships among ideology, religion, and politics. Repeat credit for students who have earned credit for 3243W. [3] (SBS)

ANTH 3243W. Ancient Maya Gods and Rulers. Politics and religion in Classic Maya culture, 100-1000 C.E. Sources and symbols of power, ritual life, and metaphysical underpinnings of hierarchy and cosmology. Relationships among ideology, religion, and politics. Repeat credit for students who have earned credit for 3243. [3] (SBS)

ANTH 3250. The Inca Empire. [Formerly ANTH 254] The rise and fall of the Inca state in the Southern American Andes. Inca society, agriculture, economy, warfare, ancestor worship, mummies, and royal wealth. Imperial expansion, the role of the feasting in Inca politics, and place of ecology in Inca religion. Destruction of the empire during the Spanish conquest; persistence of pre-Columbian culture among Inca descendants in Peru and Bolivia. [3] (INT)

ANTH 3260. Crafting Pottery in the Ancient World. [Formerly ANTH 279] Pottery as craft or locally grounded knowledge of making. Practice-based versus formal textbook learning. Hands-on experience of making

and studying ceramic vessels. Diversity of pottery in ancient societies. Qualitative and quantitative analysis of ceramic forms, fabrics, and decorations. Serves as repeat credit for students who have earned credit for 3260W. [3] (HCA)

ANTH 3260W. Crafting Pottery in the Ancient World. Pottery as craft or locally grounded knowledge of making. Practice-based versus formal textbook learning. Hands-on experience of making and studying ceramic vessels. Diversity of pottery in ancient societies. Qualitative and quantitative analysis of ceramic forms, fabrics, and decorations. Serves as repeat credit for students who have earned credit for 3260. [3] (HCA)

ANTH 3261. Introduction to Geographic Information Systems and Remote Sensing. [Formerly ANTH 280] Computerized graphics and statistical procedures to recognize and analyze spatial patterning. Spatial data-collection, storage and retrieval; spatial analysis and graphic output of map features. Integration of satellite imagery with data from other sources through hands-on experience. Assumes basic knowledge of computer hardware and software. [3] (MNS)

ANTH 3262. Ethics in Anthropology, Archaeology, and Development. [Formerly ANTH 283] Ethical perspectives on contemporary problems of archaeological and anthropological research, interaction, and interpretation of past and present non-Western societies. [3] (P)

ANTH 3343. Biology and Culture of Race. [Formerly ANTH 241] Biological and cultural perspectives on race in the United States and internationally. Patterns of human genetic variation. Biomedical use of racial categories. Social and cultural construction of race. Racism and racial discrimination. Racial disparities in health. [3] (P)

ANTH 3344. Genetic Anthropology Lab Techniques. [Formerly ANTH 272] Applications of molecular anthropology techniques. DNA data analysis. Genetic methods and findings. DNA comparisons between world populations. Studies of ancient DNA. [3] (MNS)

ANTH 3345. Genetics in Society. Influence of modern genetic technologies in everyday life. Social meanings of scientific data. Genetics of identity. Personalized genetic medicine and consumer-driven genetic testing. Genetics of food production. Assisted reproductive technologies. Revolutionary societal impacts of science. Offered on a graded basis only. [3] (P)

ANTH 3346. Human Adaptation and Disease. Evolutionary perspectives on biological and cultural adaptations to physical and pathogen environments. Human variation, human evolutionary ecology, epidemiology, and evolution of disease. Specific focus on epidemiological transitions. Offered on a graded basis only. Serves as repeat credit for ANTH 3890-02 in Fall 2016. [3] (MNS)

ANTH 3347. Bioethics in Anthropology. Humans as study subjects in research. Human complexities and experimentation; eugenics; and ethical, legal, and social issues of research. [3] (SBS)

ANTH 3371. Social and Health Consequences of Pandemics. [Formerly ANTH 244] Origins, spread, mortality, and the biological and social consequences. The epidemic of bubonic plague in the 1300s, known as the European Black Death. The devastation of indigenous New World populations by European diseases after 1492. Social and medical responses. Implications for modern societies. [3] (SBS)

ANTH 3372. Human Osteology. [Formerly ANTH 270] Anatomy of the human skeleton. Determination of age, sex, stature, and biological affinity from bones and dentition. Analysis of archaeological skeletal remains for diagnosis of disease and identification of cultural practices. Use of human remains in criminal investigation. [3] (MNS)

ANTH 3620. Maya Language and Literature. [Formerly ANTH 221] Introduction to a contemporary Maya language. Linguistic analysis and cultural concepts. By permission of instructor. May be repeated for the study of different Maya languages for a total of 6 credits. Repeat credit for students who completed 3620W. [1-6; maximum of 6 credits total for all semesters of ANTH 221] (No AXLE credit)

ANTH 3622. Classic Maya Language and Hieroglyphs. [Formerly ANTH 261] Linguistic analysis of Classic Maya hieroglyphs, 100-1000 C.E. Methods of decipherment reading and interpreting an ancient script. Role

of socioeconomic status in literacy. Repeat credit for students who completed 3622W. [3] (SBS)

ANTH 3622W. Classic Maya Language and Hieroglyphs. Linguistic analysis of Classic Maya hieroglyphs, 100-1000 C.E. Methods of decipherment reading and interpreting an ancient script. Role of socioeconomic status in literacy. Repeat credit for students who completed 3622. [3] (SBS)

ANTH 3850. Independent Research. [Formerly ANTH 288A] Readings on selected topics (of the student's choice) and the preparation of reports. [1-3] (No AXLE credit)

ANTH 3851. Independent Research. [Formerly ANTH 288B] Readings on selected topics (of the student's choice) and the preparation of reports. [1-3] (No AXLE credit)

ANTH 3865. Field Research. [Formerly ANTH 289] Directed field research on topics of the student's choice. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [1-6] (No AXLE credit)

ANTH 3866. Archaeological Excavation. Excavation techniques and field recording methods through participation in an archaeological dig. Excavation unit layout, digging techniques, feature and artifact identification. Mapping and field instrumentation. Data registry, statistical analysis, artifact curation, and conservation. Stratigraphy, relative and absolute dating, sampling strategies and techniques, data management. Research design and archaeological ethics. [4] (MNS)

ANTH 3880. Internship Training. [Formerly ANTH 287B] Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 will not count toward the Anthropology major or minor. Students from any discipline can gain experience working with a local, national, or international organization in developing a project to broaden their understanding of anthropological issues. Hours for background readings and research will be completed in ANTH 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in ANTH, and prior approval of the student's plan by the director of undergraduate studies in Anthropology are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

ANTH 3881. Internship Readings and Research. [Formerly ANTH 287A] Readings and research conducted under the supervision of a member of the Anthropology department and a substantial research paper are required. Students from any discipline can gain experience working with a local, national, or international organization in developing a project to broaden their understanding of anthropological issues. Hours for background readings and research will be completed in ANTH 3881 concurrently with and regardless of the numbers of hours taken in internship training in 3880. Normally a 2.90 grade point average, 6 hours of prior work in ANTH, and prior approval of the student's plan by the director of undergraduate studies in Anthropology are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Corequisite: 3880. [Variable credit: 1-6] (No AXLE credit)

ANTH 3890. Special Topics. [Formerly ANTH 294] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

ANTH 4152. Activism and Social Change: Theory, Experience, and Practice. [Formerly ANTH 286] Introduction to theory and ethics of social activism and advocacy. Roles of academics and scholars. Theories of political organizing and mobilization. Application of anthropological research methods. Case studies in local, national, and global social issues, processes of civic mobilization, and social change. [3] (SBS)

ANTH 4153. Economic Anthropology. [Formerly ANTH 234] Modern and postmodern cultural organization of Western and non-Western economies. Crosscultural comparison of concepts of self-interest and rationality. Relation of the growth of post-industrial (service and information) economies to economic strategies of ethnic groups. Survey of indigenous alternatives to development. Theoretical issues grounded in case studies from our own and other cultures. [3] (SBS)

ANTH 4154. Environmental Anthropology. [Formerly ANTH 207] The relationship between human beings and the environments that sustain them. Global diversity of human ecological adaptations. Hunter-gatherers, pastoral nomads, slash-and-burn agriculturalists, and irrigation agriculturalists. Human impact on the environment. Theories of human ecological interaction. [3] (SBS)

ANTH 4155. Realities and Worldviews: Why Culture Matters. [Formerly ANTH 255] Worldviews and constructed realities that influence human behavior. Stereotyping and conflict as triggered by ontological misunderstandings. Western ontology, science, and understanding the Other. Interaction of worldviews and human behavior such as in resource management and public health. Offered on a graded basis only. [3] (SBS)

ANTH 4345. Human Evolutionary Genetics. [Formerly ANTH 273] Core issues in human evolution and population genetics. Molecular evidence for the origin of modern humans, reconstruction of human migrations, race, and detection of admixture between populations. Implications for human disease. Offered on a graded basis only. Prerequisite or corequisite: BSCI 1100, BSCI 1105, or BSCI 1510. [3] (MNS)

ANTH 4373. Health and Disease in Ancient Populations. [Formerly ANTH 274] Paleopathology of mummies and skeletons. Skeletal evidence for violence and warfare. Gender and social status differences in diet, disease, and activity patterns to reconstruct ancient social organization. Biological relationships among ancient and modern populations. Ethics and federal law in the study of human remains. Laboratory analysis of skeletons. [3] (MNS)

ANTH 4998. Honors Research. [Formerly ANTH 298] Research to be done in consultation with a member of the faculty in anthropology. Open only to those beginning honors work in anthropology. May be repeated for a total of 6 credits. [1-6; maximum of 6 credits total for all semesters of 4998] (No AXLE credit)

ANTH 4999. Honors Thesis. [Formerly ANTH 299] Open only to seniors in the departmental honors program. Students completing this course with distinction, including a thesis and final examination, will earn honors in anthropology. Prerequisite: 4998. May be repeated for a total of 6 credits if there is no duplication in topic. [1-6; maximum of 6 credits total for all semesters of 4999] (No AXLE credit)

Arabic

ARA 1101. Elementary Arabic. [Formerly ARA 210A] Development of reading, listening, speaking, and writing skills. No credit for students who have earned credit for a more advanced Arabic language course. [5] (No AXLE credit)

ARA 1102. Elementary Arabic. [Formerly ARA 210B] Continuation of 1101. Development of reading, listening, speaking, and writing skills. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 1101. [5] (INT)

ARA 2201. Intermediate Arabic. [Formerly ARA 220A] Practice and development of language skills at the intermediate-advanced level. Intensive work in spoken Arabic with emphasis on vocabulary acquisition, reading comprehension, and writing skills. Advanced grammar, modern Arabic word formation, verb aspect usage, and structure of complex sentences. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 1102. [3] (INT)

ARA 2202. Intermediate Arabic. [Formerly ARA 220B] Continuation of 2201. Practice and development of language skills at the intermediate-advanced level. Intensive work in spoken Arabic with emphasis on vocabulary acquisition, reading comprehension, and writing skills. Advanced grammar, modern Arabic word formation, verb aspect usage, and structure of complex sentences. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 2201. [3] (INT)

ARA 3101. Advanced Arabic. [Formerly ARA 230A] Further development of listening, reading, speaking, and writing skills in the Arabic language. Emphasis on grammar and literary techniques. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 2202. [3] (INT)

ARA 3102. Advanced Arabic. [Formerly ARA 230B] Continuation of 3101. Further development of listening, reading, speaking, and writing skills in the Arabic language. Emphasis on grammar and literary techniques. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Arabic language course. Prerequisite: 3101. [3] (INT)

ARA 3201. Media Arabic. [Formerly ARA 240] Listening to, discussing, simulating, and analyzing Arabic media materials. Coverage of current and historical events, such as TV broadcasts, headline news, documentaries, and public discussions on political, religious, and cultural issues. Offered on a graded basis only. Prerequisite: 3102. [3] (INT)

ARA 3301. Arabic of the Qur'an and Other Classical Texts. [Formerly ARA 250] Syntactical and morphological features of Classical Arabic. Differences and similarities with Modern Standard Arabic in vocabulary usage, semantic extensions, and context. Vocabulary borrowing. Texts drawn from the Qur'an, Hadith, and Sira (biographical) literature. [3] (INT)

Aramaic

ARAM 2400. Introduction to Classical Syriac. Script and basic grammar. Historical context of language as Aramaic dialect. Simple readings from Syriac translations of Christian and Jewish scripture. [3] (INT)

ARAM 2500. Egyptian Aramaic. Reading 5th century BCE texts from the Jewish community at Elephantine. Papyri and ostraca. Historical, linguistic, and cultural context. Relationship to Biblical tradition. [3] (INT)

Art Studio

ARTS 1001. Commons iSeminar. [Formerly ARTS 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

ARTS 1099. Maymester Contemporary Art Blitz. [Formerly ARTS 285] Intensive review of contemporary art through excursions to museums, galleries, and artists' studios. Insights from curators, dealers, and films. Cities vary each year. May be repeated for credit more than once if there is no duplication in topic. [3] (HCA)

ARTS 1101. Introduction to Studio Art. [Formerly ARTS 101] Processes, fundamental elements, and principles of art. Drawing, painting, print-making, sculpture, photography, installation, and time-based art. [3] (HCA)

ARTS 1102. Drawing and Composition I. [Formerly ARTS 102] Introduction to drawing: visual problems related to observation, idea formation, composition, media, and various forms of expression. Figure and landscape may be included. [3] (HCA)

ARTS 1103. Drawing From Life. Methods used to depict the form and structure of naturalistic subjects, including the human figure. Gesture, sighting & measuring, contour drawing, and value. Metaphorical and narrative use of life forms and the human figure in art. [3] (HCA)

ARTS 1111. First-Year Writing Seminar. [Formerly ARTS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ARTS 1200. Photography I. [Formerly ARTS 120] Black-and-white photography. The aesthetics and techniques of the black-and-white medium; 35mm camera use, film exposure, image quality, and darkroom practices. [3] (HCA)

ARTS 1201. Alternative Photography. [Formerly ARTS 121] Methods in image making. Photographic narratives, book making, pinhole cameras. [3] (HCA)

ARTS 1202. Digital Imaging I. [Formerly ARTS 122] Creation of still, photo-based images using digital cameras, scanners, and computer software for digital output. Issues in contemporary art. [3] (HCA)

ARTS 1300. Painting. [Formerly ARTS 130] Technical and conceptual aspects of painting. Individual instruction based on ability and experience. Prerequisite: 1102. [3] (HCA)

ARTS 1400. Ceramics. [Formerly ARTS 140] Introduction to ceramic design and preparation of clay objects. Hand-building, wheel-throwing, ceramic sculpture, surface enrichment, glazing, and kiln-firing. [3] (HCA)

ARTS 1401. Sculptural Ceramics. [Formerly ARTS 141] Expressive art forms in clay. Assembled components, surface enrichment, and firing techniques. [3] (HCA)

ARTS 1500. Sculpture. [Formerly ARTS 150] Changing concepts, materials, and processes in sculpture. Individual instruction based on ability and experience. [3] (HCA)

ARTS 1501. Assemblage. [Formerly ARTS 151] Additive processes in sculpture. Problems involving found objects, kinetic/time-based ideas, and site-specific installations. [3] (HCA)

ARTS 1502. Installation Art. [Formerly ARTS 152] Historical survey from 1900 to present; studio practice; formal and conceptual issues. [3] (HCA)

ARTS 1503. Text and Image. [Formerly ARTS 112] Intersection of art and writing. History, theory, and practice. Zines, posters, photography, new media, and artists' books. [3] (HCA)

ARTS 1600. Printmaking: Etching and Relief. [Formerly ARTS 110] Introduction to printmaking. Focus on relief printing and etching on copper. Traditional and experimental approaches. [3] (HCA)

ARTS 1601. Printmaking: Screen and Lithography. [Formerly ARTS 111] Introduction to printmaking media, focus on screen printing and lithography. Traditional and experimental approaches. [3] (HCA)

ARTS 1700. Video Art. [Formerly ARTS 171] Video as an art form. Group and individual productions. Viewing and discussion. Project analysis and critique. Relationship to such traditional media as photography and film. [3] (HCA)

ARTS 1701. Performance Art. [Formerly ARTS 172] History, theory, and practice of performance. Vocal studies and conceptual music, personal narrative, performance as a response to the cult-of-celebrity, body art, and performance with new technologies. Collaborative and solo performance projects. [3] (HCA)

ARTS 1702. Portable Media I. [Formerly ARTS 173] Creative potential of inexpensive, portable digital media devices. Establishment of a rapid rhythm of practice and experimentation to build an inventory of ideas, methods, and techniques. Historic and contemporary developments in narrative and non-narrative digital video production. [3] (HCA)

ARTS 1800. Sources of Contemporary Art. [Formerly ARTS 180] Contemporary studio art practice, issues, and theories. Visual and conceptual influences on living artists; idea formation. Students must participate in artist-in-residence projects. [3] (HCA)

ARTS 1900. Social Collective Art Practice. [Formerly ARTS 190] History and practice of making art within the social collective experience. Small group projects based on everyday living in The Commons. Not open to students who have earned credit for ARTS 1111-01. Total credit for this course and ARTS 1111-01 will not exceed 3 hours. Credit hours reduced from second course taken (or test or transfer credit) as appropriate. [3] (HCA)

ARTS 2100. Drawing and Composition II. [Formerly ARTS 202] Prerequisite: 1102. [3] (HCA)

ARTS 2101. Life Drawing I. [Formerly ARTS 205] Methods used to depict form and structures of the human figure. Gesture, sighting and measuring, contour drawing, and value. Planar and anatomical analysis. Metaphorical and narrative use of the human figure in art. Prerequisite: 1102. [3] (HCA)

ARTS 2102. Drawing: Color Media I. [Formerly ARTS 207] Drawing on paper with wet and dry color media. Traditional and experimental approaches. Prerequisite: 1102. [3] (HCA)

ARTS 2103. Experimental Drawing. Non-traditional approaches to drawing materials and methods. Drawings as installations, animations, and murals. Prerequisite: 1102. [3] (HCA)

ARTS 2104. Drawing from Life II. Methods used to depict form and structure of naturalistic subjects, including the human figure. Gesture, sighting and measuring, contour drawing, and value. Metaphorical and narrative use of life forms and the human figure in art. Prerequisite: 1103. [3] (HCA)

ARTS 2200. Photography II. [Formerly ARTS 220] Concepts and techniques of contemporary photographic practice; experimental projects and workshops using analog and digital media. Issues in contemporary art. Prerequisite: 1200, 1201, or 1202. [3] (HCA)

ARTS 2202. Digital Imaging II. [Formerly ARTS 222] Advanced exploration of digital software and its integration with traditional media. Personal projects and critiques. Issues in contemporary art. Prerequisite: 1202. [3] (HCA)

ARTS 2300. Painting II. [Formerly ARTS 230] Prerequisite: 1300. [3] (HCA)

ARTS 2400. Ceramics II. [Formerly ARTS 240] Development of ceramic design, both traditional and contemporary, functional and sculptural. Projects develop technical and aesthetic goals. Instruction includes demonstrations, slide presentations, field trips, guest artists, reports. Demonstrations include advanced throwing, complex constructions, glaze development with applications, and kiln-firing. Prerequisite: 1400. [3] (HCA)

ARTS 2401. Concept and Clay: Composite Forms. [Formerly ARTS 241] Technical ability in handling clay and conceptual and interpretive elements in functional and/or sculptural forms. Individual solutions in form and surface. Prerequisite: 1400 or 1401. [3] (HCA)

ARTS 2500. Sculpture II. [Formerly ARTS 250] Prerequisite: 1500, 1501, or 1502. [3] (HCA)

ARTS 2502. Advanced Installation Art. [Formerly ARTS 252] Techniques, processes, and placement. Conceptual and historical practices. Prerequisite: 1502. [3] (HCA)

ARTS 2600. Printmaking II. [Formerly ARTS 210] Advanced study in traditional and experimental printmaking processes. Prerequisite: 1600 or 1601. [3] (HCA)

ARTS 2700. Video Art II. [Formerly ARTS 271] Viewing, discussion, analysis and critiques. Relationship to photography, film, and performance. Group and individual productions. Prerequisite: 1700. [3] (HCA)

ARTS 2701. Performance Art II. [Formerly ARTS 272] History, theory, and practice. Vocal studies, conceptual music, personal narrative, performance as a response to the cult-of-celebrity, body art and performance with new technologies. Collaborative and individual performance projects. Prerequisite: 1701. [3] (HCA)

ARTS 2702. Portable Media II. [Formerly ARTS 273] Advanced exploration in use of portable digital media devices. Variety of methods for conceptualizing and making projects; enhanced art making skills. Prerequisite: 1700, 1701, or 1702. [3] (HCA)

ARTS 3100. Drawing and Composition III. [Formerly ARTS 203] Prerequisite: 1102 and 2100. [3] (HCA)

ARTS 3101. Life Drawing II. [Formerly ARTS 206] Prerequisite: 2101. [3] (HCA)

ARTS 3102. Drawing: Color Media II. [Formerly ARTS 208] Prerequisite: 2102. [3] (HCA)

ARTS 3200. Photography III. [Formerly ARTS 221] Personal projects and critiques. Interdisciplinary possibilities. Issues in contemporary art. Prerequisite: 2200 or 2202. [3] (HCA)

ARTS 3300. Painting III. [Formerly ARTS 231] Prerequisite: 2300. [3] (HCA)

ARTS 3600. Printmaking III. [Formerly ARTS 211] Advanced study in traditional and experimental printmaking processes. Prerequisite: 2600. [3] (HCA)

ARTS 3851. Independent Research. [Formerly ARTS 289] Supervised work beyond regular offerings in the curriculum. Students may only register with consent of instructor involved and with written approval of the director of undergraduate studies. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of ARTS 3851] (No AXLE credit)

ARTS 3891. Selected Topics. [Formerly ARTS 288] May be repeated for a total of 9 credits if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 9 credits total for all semesters of ARTS 3891] (HCA)

ARTS 3970. Directed Study: Senior Show and Contemporary Practices. [Formerly ARTS 290] Theoretical and practical concerns including professional practices for artists. Students visit exhibitions and discuss contemporary art with directed readings and lectures, participate in critiques, and exhibit their work. Seniors with a concentration in art only. [3] (HCA)

ARTS 3971. Independent Research: Senior Show. [Formerly ARTS 291] Research conducted under faculty supervision specifically in preparation for the Senior Show. Open only to senior majors in their final term. [3] (No AXLE credit)

ARTS 4998. Senior Honors Research. [Formerly ARTS 299A] Research conducted in consultation with a faculty member in Art. Offered on a graded basis only. Open only to honors majors. [3] (No AXLE credit)

ARTS 4999. Senior Honors Thesis. [Formerly ARTS 299B] Research conducted in consultation with a faculty member in Art. Offered on a graded basis only. Open only to senior honors majors. [3] (No AXLE credit)

Asian Studies

ASIA 1001. Commons iSeminar. [Formerly ASIA 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ASIA 1111. First-Year Writing Seminar. [Formerly ASIA 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ASIA 1201. Writing Southeast Asia. [Formerly ASIA 150] Literary representations, including novels and personal memoirs, of the history of Southeast Asia. Colonial and postcolonial periods. Representations of pluralistic cultures, diverse languages, religions, and indigenous and national identities. Indonesia, Myanmar, Philippines, Thailand, and Vietnam. All texts in English translation. [3] (HCA)

ASIA 1680. Inside China. [Formerly ASIA 236] First-hand experience of China's dynamic society and expanding economy. Guided exploration of famous historical sites and contemporary institutions such as hospitals, businesses, factories, and art galleries in Beijing and Shanghai. Interviews with individuals from many different walks of life, including physicians, entrepreneurs, migrant workers, and college students. No knowledge of Chinese is required. Offered on a graded basis only. [3] (INT)

ASIA 1682. Chinese Culture through Tai Chi and Qi Gong. Chinese culture through physical and spiritual practice of Tai Chi (Yang Style short form) and (Ba Duan Jin) Qi Gong. Concepts of traditional Chinese culture, such as the "unity of man and nature," and the complementary forces of yin and yang. [1] (No AXLE credit)

ASIA 1780. Health and Well-Being at the Margins of Indian Society. Maymester in India. Holistic medicine. Marginalized communities. Treatments and social services. NGO work. [3] (INT)

ASIA 1881W. The Body in Modern Japanese Culture. 1890s to present. Cultural and social meanings of the body in Japanese history. Fiction and film. Gender, sexuality, illness, the senses, war, and violence. [3] (INT)

ASIA 2100W. Fashioning the Self: Coming of Age and Asian Modernities. [Formerly ASIA 200W] The coming-of-age novel (Bildungsroman) as

a literary form in twentieth-century Asia. Travails of modernity and colonialism; the effects of crossing national, racial, and cultural boundaries; the experiences of traveling to urban centers, foreign countries, and ancestral lands. Texts from China, Indonesia, Japan, Philippines, and Vietnam. Taught in English. [3] (INT)

ASIA 2210W. Hollywood Hanoi. [Formerly ASIA 250W] Cultural narratives of the Vietnam War, including novels and films. War and representation. International, minority, and antiwar perspectives on the violence and aftermath. Muhammad Ali, Werner Herzog, Jean Genet, Graham Greene, and Dinh Linh. All texts in English translation. Not open to students who have earned credit for ASIA 1111 Section 04 without permission. Total credit for this course and ASIA 1111 Section 04 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (INT)

ASIA 2302. Popular Culture of South Asia. Film, sport, music, clothing, and other contemporary popular culture artifacts. [3] (INT)

ASIA 2411. Cultural History of Korea. Korean culture from antiquity to the present through diverse media. Origins of Korean traditions, popular beliefs, and systems of thought. Korea's transformation through encounters with the West, struggle under Japanese colonial rule, and the Korean War. Contemporary economic development, democracy movement, relations with North Korea and the United States, and sociocultural diversification in the age of globalization. [3] (INT)

ASIA 2412. Global Korean Cinema. From the colonial period to the Korean Wave in the new millennium. Film criticism, transnational and national contexts of film production, aesthetics of auteurs and genres, and local and global receptions of Korean cinema. [3] (INT)

ASIA 2413. History of Modern Korea. Early twentieth century to present. Critical approaches and debates. Colonial experience and national building. Wars and migration; crisis and everyday life on the Korean Peninsula. Neoliberal globalization and its critiques, and efforts for reconciliation and peace in the Asia-Pacific region. [3] (INT)

ASIA 2414. Food and Family in Korean Pop Culture. Food as embodiment of individual, family, and collective identities in Korea and the Korean diaspora. Class, gender, ethnicity, and body politics through literature, film, TV dramas, webtoons, and pop music. Not open to students who have earned credit for ASIA 3892-01 in Fall 2018 without permission. Total credit for this course and ASIA 3892-01 in Fall 2018 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (INT)

ASIA 2511. Popular Culture in Modern Japan. [Formerly ASIA 211] Popular culture in Japan from 1900 to the present. The rise of mass culture and media, song, sports, food, fashion, and popular film genres. [3] (INT)

ASIA 2512. Explorations of Japanese Animation. [Formerly ASIA 212] Introduction to the form and content of Japanese animation as globalized popular entertainment and as a speculative artistic medium that explores history and memory, nature and technology, human identity, carnivalesque comedy, and gender relations. [3] (INT)

ASIA 2513W. Media Monsters in Contemporary Japan. [Formerly ASIA 213W] The supernatural and the monstrous as represented in the context of mass media and consumerism in contemporary Japan. Live-action J-horror films, popular fiction, Manga, animated films, and television series. [3] (HCA)

ASIA 2560. Current Japan-U.S. Relations. [Formerly ASIA 240] Similarities and differences in theory and practice in the United States and Japan on public policy issues such as trade, defense, environment, education, medical care, and racial prejudice. [3] (INT)

ASIA 2605. Romancing the Nation in Modern Chinese Literature. From the fourteenth century to the present. Fiction, drama, and poetry. Family relations and nation-state in romantic writings. Knowledge of Chinese is not required. [3] (HCA)

ASIA 2606. Martial Tradition in Chinese Literature. From eleventh century BCE to modern period. War, banditry, revenge, cannibalism, female knight-errant. All genres of literature, supplemented by visual material, theater, and film. Knowledge of Chinese is not required. [3] (HCA)

ASIA 2607. Self and Society in Pre-modern Chinese Literature. From the seventeenth-century BCE to the seventeenth-century CE. Poetry, prose, fiction, and drama. Self, society, religion, gender, and print culture. Offered on a graded basis only. Serves as repeat credit for ASIA 3891 section 01 in Fall 2015. Knowledge of Chinese is not required. [3] (HCA)

ASIA 2608. Chinese Drama: 13th to 20th Centuries. Traditional and modern Chinese drama. Text, image, and performance. Gender, religious thinking, commerce, and censorship. Offered on a graded basis only. Knowledge of Chinese not required. [3] (HCA)

ASIA 2609W. Writing and Gender in Traditional China. Pre-modern China: 1st century CE to 20th century CE. Women writers, women in family and society, gender relations, cross-dressing, and foot-binding. Poetry, prose, drama, fiction, and visual materials. Offered on a graded basis only. [3] (HCA)

ASIA 2630. Chinese Medicine. [Formerly ASIA 230] Historical encounters and divergences between medicine in China and in the West. Chinese medical classics, including the Inner Canon of the Yellow Emperor and early herbal manuals. The creation of Traditional Chinese Medicine in the People's Republic of China and the emergence of Chinese medicine as alternative medicine in the U.S. [3] (P)

ASIA 3151. The Third World and Literature. [Formerly ASIA 251] The history of cultural and political concepts of the Third World from 1955 to the present. Contemporary literary and cultural debates regarding models of transnationalism and processes of globalization. National literatures and cultures foundational to the Third World model. The relationship between the genre of the novel and the formation of national communities. [3] (INT)

ASIA 3155. Blackness and the Asian Century. The solidarity movement between Africa and Asia from the turn of twentieth century into the current "Asian Century." Ongoing relevance of the color-line concept; racialized logics, processes of globalization, and the international division of labor. [3] (INT)

ASIA 3633. Self-Cultivation in Ancient China. [Formerly ASIA 233] 300 BCE to 500 CE. Methods, goals, and contexts of self-cultivation in antiquity. Breathing exercises, meditation, visualization, sexual arts, sacrifice, alchemy, and other practices in their religious, cultural, and social contexts. [3] (INT)

ASIA 3851. Independent Study. [Formerly ASIA 289A] Designed primarily for majors who want to study Asian topics not regularly offered in the curriculum. Must have consent of instructor. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

ASIA 3852. Independent Study. [Formerly ASIA 289B] Designed primarily for majors who want to study Asian topics not regularly offered in the curriculum. Must have consent of instructor. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

ASIA 3891. Special Topics. [Formerly ASIA 294A] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3] (No AXLE credit)

ASIA 3892. Special Topics. [Formerly ASIA 294B] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3] (No AXLE credit)

ASIA 3980. Junior Honors Readings. [Formerly ASIA 297] May be repeated for credit more than once. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

ASIA 4998. Honors Research. [Formerly ASIA 299A] Research conducted in consultation with a member of the faculty or affiliated faculty of the program. Open only to senior honors majors. [1-3] (No AXLE credit)

ASIA 4999. Honors Research. [Formerly ASIA 299B] Research conducted in consultation with a member of the faculty or affiliated faculty of the program. Open only to senior honors majors. Prerequisite: 4998. [1-3] (No AXLE credit)

Astronomy

ASTR 1001. Commons iSeminar. [Formerly ASTR 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ASTR 1010. Introductory Astronomy: Stars and Galaxies. [Formerly ASTR 102] Observed and physical properties of stars. Supernovae, neutron stars, and black holes. Our Milky Way galaxy and other galaxies. Cosmology, dark matter, dark energy, and the Big Bang. Not open to students who have earned credit for ASTR 1210 or 3000 without permission. Total credit for this course and ASTR 1210 will not exceed 4 credit hours. Total credit for this course and ASTR 3000 will not exceed 3 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [3] (MNS)

ASTR 1010L. Introductory Nighttime Astronomy Laboratory. [Formerly ASTR 103] Motion of the celestial sphere and apparent and real motions of celestial bodies as viewed from inside the Milky Way. Observations of meteor showers, comets, and artificial satellites. Telescopic observations of astronomical objects. Stellar spectra. Laboratory ordinarily accompanied by 1010 or 3000. Satisfies the AXLE lab course requirement when completed with 1010 or 3000. Serves as repeat credit for ASTR 1020L. Not open to students who have earned credit for ASTR 1210 without permission. Total credit for this course and ASTR 1210 will not exceed 4 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [1] (No AXLE credit)

ASTR 1020L. Introductory Daytime Astronomy Laboratory. [Formerly ASTR 104] Phases of the Moon, colors of stars, shapes and motions of galaxies, properties of exoplanets, and ages of star clusters. Telescopic observations of the Sun. Laboratory ordinarily accompanied by 1010 or 3000. Satisfies the AXLE lab course requirement when completed with 1010 or 3000. Serves as repeat credit for ASTR 1010L. Not open to students who have earned credit for ASTR 1210 without permission. Total credit for this course and ASTR 1210 will not exceed 4 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [1] (No AXLE credit)

ASTR 1111. First-Year Writing Seminar. [Formerly ASTR 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ASTR 1210. Introduction to Observational Astronomy. [Formerly ASTR 122] Telescopic and naked eye observations. Light, optics, telescopes, and CCD cameras. Motions of the sky. Kepler's laws. Phases and topography of the Moon. Distances, temperatures, and brightnesses of stars. Star clusters. Dark matter. Taught entirely at Dyer Observatory using 24-inch telescope. Satisfies the AXLE lab course requirement. Not open to students who have earned credit for ASTR 1010, 1010L, 1020L, or 3000 without permission. Total credit for this course and ASTR 1010, 1010L, 1020L, or 3000 will not exceed 4 hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [4] (MNS)

ASTR 2110. The Solar System. [Formerly ASTR 201] The sky, orbits, and gravity. Ancient astronomy. Seasons, the calendar, phases and motions of the moon, tides, and eclipses. Terrestrial planets, giant planets and their moons and rings, asteroids, comets, meteorites, and the sun. Habitable zones for planets and moons, extremophiles, and the possibility of life on other worlds. [3] (MNS)

ASTR 2130. The Trial of Galileo and its Background. [Formerly ASTR 203] The interdependence of cosmological theories and religious teachings from the eighth century BCE to the end of the seventeenth century. Examines scientific works and religious texts, including those of Aristotle, Thomas Aquinas, Copernicus, Luther, Galileo, and Newton. [3] (P)

ASTR 2150. Celestial Navigation and Celestial Dynamics. Sources of motion of Earth, including orbital motion, rotation, precession, and nutation. Planetary transits and eclipses. Apparent and real motions of stars. Celestial coordinate systems. Sextant observations and celestial navigation. Serves as repeat credit for ASTR 3890 in Summer 2017. [3] (MNS)

ASTR 3000. Principles of Astrophysics. [Formerly ASTR 205] Tools and methods of astrophysics, including light and telescopes. Cosmology, the Big Bang, and the origin and evolution of matter. Galaxies, star formation, and the physics of stars, including nucleosynthesis and stellar death. Techniques for discovering and measuring properties of exoplanets. Not open to students who have earned credit for ASTR 1010 or 1210 without permission. Total credit for this course and ASTR 1010 will not exceed 3 credit hours. Total credit for this course and ASTR 1210 will not exceed 4 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. Prerequisite: either PHYS 1501, 1601, or 1911; and either MATH 1200 or 1300. [3] (MNS)

ASTR 3600. Stellar Astrophysics. [Formerly ASTR 252] Physics of stellar structure and evolution, including nuclear energy generation, equations of state, and heat transfer by radiation and convection. Numerical stellar models. Observational aspects of stellar astrophysics. Prerequisite: either MATH 2400, 2420, or 2610; either PHYS 2255 or 3651; 3200; and either CS 1101 or 1103. [3] (MNS)

ASTR 3700. Galactic Astrophysics. [Formerly ASTR 253] Interstellar matter and gaseous nebulae, the structure and evolution of normal galaxies, active galactic nuclei and quasars, and observational cosmology. Serves as repeat for credit for ASTR 8040. Prerequisite: MATH 2400, 2420, or 2610; and either PHYS 2255 or 3651. Corequisite: CS 1101, 1103, or 1104. [3] (MNS)

ASTR 3800. Structure Formation in the Universe. [Formerly ASTR 254] Observational and theoretical aspects of extragalactic astronomy. Measurements of galaxies and of the large-scale structure of the universe from galaxy surveys. Expansion history of universe; roles of dark matter and energy. Growth of density fluctuations in universe due to gravity. Cosmological N-body simulations and formation of dark matter halos. Physics of galaxy formation. Experimental probes of dark matter and energy. Prerequisite: One of PHYS 1501, 1601, or 1911; and one of PHYS 1502, 1602, or 1902; and one of MATH 2400, 2420, or 2610; and one of CS 1101, 1103, or 1104. [3] (MNS)

ASTR 3850. Undergraduate Research. Research and scholarly investigation or directed readings in astronomy under close supervision of sponsoring faculty member. Enrollment by arrangement with sponsoring faculty member and approval of director of undergraduate studies. May be repeated for credit, for a total of no more than 10 total credit hours and for no more than 5 credit hours per semester. [1-5] (No AXLE credit)

ASTR 3890. Selected Topics. [1-3] (No AXLE Credit)

ASTR 3900. General Relativity and Cosmology. [Formerly ASTR 260] Introduction to Einstein's theory describing gravity as a curvature of spacetime. Tensor analysis, special relativity, differential geometry, spacetime curvature, the Einstein field equations, the Schwarzschild metric for stars and black holes, and the Friedmann-Robertson-Walker metric for cosmology. Prerequisite: PHYS 2270 and 2290. [3] (MNS)

ASTR 4998. Honors Research and Senior Thesis. [Formerly ASTR 296] Independent experimental or theoretical investigations of basic problems in astronomy and astrophysics under faculty supervision, culminating in a written thesis submitted to and an oral defense presented to a departmental faculty examination committee. Required for departmental honors in Astronomy. Enrollment by arrangement with sponsoring faculty member and approval of director of undergraduate studies. May be repeated for a total of 10 credits, but students may earn only up to 6 credits per semester of enrollment. Prerequisite: major in Physics, junior or senior standing. [1-6] (No AXLE credit)

Biochemistry and Chemical Biology

BCB 2101. Chemical Biology Focus. Roles of proteins, lipids, nucleic acids, and carbohydrates in human disease. Experimental techniques. Prerequisite: CHEM 2221 and BSCI 1510. [1] (No AXLE credit)

BCB 3101. Special Topics in Chemical Biology. May be repeated for credit more than once if there is no duplication in topic. Prerequisite: CHEM 3710. [3] (MNS)

BCB 3201. Independent Laboratory Research. Student research under the supervision of faculty associated with the Biochemistry and Chemical Biology major. Enrollment through course coordinator (after arrangement with faculty) before the end of the previous semester. Prerequisite: BSCI 1510 and CHEM 1602, consent of Biochemistry and Chemical Biology Director of Undergraduate Studies, 3.0 cumulative grade point average. May be repeated for credit more than once, but students may earn only up to 6 credits per semester of enrollment. [2-6] (No AXLE credit)

BCB 3880. Internship Training. Under faculty supervision, students from any discipline can gain scientific research experience in a broad range of public or private institutions or government laboratories. Credit hours are based upon actual work performed at the internship site. A minimum of 1 credit hour in background readings and research must be completed in BCB 3881 concurrently with, and regardless of, the number of hours earned in BCB 3880. A substantial research paper must be submitted at the end of the semester during which the internship is completed. These credit hours may NOT count toward the minimum credit hours required for the biochemistry & chemical biology major. Normally a 3.0 grade point average, 6 hours of prior coursework in BCB major, and prior approval of a specific plan of work by the director of undergraduate studies in Biochemistry & Chemical Biology are required. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Corequisite: 3881. Variable credit. [1-9] (No AXLE credit)

BCB 3881. Internship Readings and Research. Under faculty supervision, students from any discipline can gain scientific research experience in a broad range of public or private institutions or government laboratories. Credit hours are based upon readings or research supervised by BCB faculty to lend some intellectual foundation to the internship experience. A minimum of 1 credit hour in background readings and research must be completed in BCB 3881 concurrently with, and regardless of, the number of credit hours earned in BCB 3880. A substantial research paper must be submitted at the end of the semester during which the internship is completed. These credit hours may not count toward the minimum credit hours required for the Biochemistry & Chemical Biology major. Normally a 3.0 grade point average, 6 hours of prior coursework in BCB, and prior approval of a specific plan of work by the director of undergraduate studies in Biochemistry & Chemical Biology are required. Offered on a graded basis only and must be taken concurrently with 3880. Corequisite: 3880. Variable credit. [1-6] (No AXLE credit)

BCB 4320. Advanced Chemical Biology. (Also listed as CPBP 8320 Foundations in Chemical Biology) Overviews and in-depth case studies on the breadth of chemical biology. Importance of chemical biology in advancing biological sciences. Offered on a graded basis only. Prerequisite: CHEM 3710 [3] (MNS)

BCB 4965. Advanced Integrated Laboratory. Chemical and biomolecular analysis, separation, and spectroscopy. Chemical synthesis. Experimental design, computational methods. Offered on a graded basis only. Limited to BCB senior majors. Prerequisite or Co-requisite: BSCI 2520 and CHEM 3710. [3] (MNS)

BCB 4966. Advanced Integrated Laboratory. Continuation of 4965. Directed research. Offered on a graded basis only. Limited to senior BCB majors. Prerequisite: 4965. [3] (MNS)

BCB 4999. Honors Research. Original supervised research. Consent of DUS required. Only open to BCB majors. May be repeated for credit. Prerequisite: 3201. [3-6] (No AXLE credit)

Biological Sciences

BSCI 1001. Commons iSeminar. [Formerly BSCI 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

BSCI 1100. Biology Today. [Formerly BSCI 100] Broad coverage of the biological sciences presenting evolution as the unifying concept. Particular emphasis on basic biological processes in cells and the relationships/interactions between organisms and their environment. Topics include cell structure and function, genetics and inheritance, evolution and diversity, populations, communities and ecosystems, and topics related to biology

and society. Not open to students who have earned credit for BSCI 1510 or 1511 without permission. Total credit for this course and BSCI 1510 or 1511 will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Corequisite: 1100L. [3] (MNS)

BSCI 1100L. Biology Today Laboratory. [Formerly BSCI 101A] Laboratory investigations of the genetics, physiology, and ecology of plants and animals. One three-hour laboratory per week to accompany 1100. Not open to students who have earned credit for BSCI 1510L, 1511L, or 1512L without permission. Total credit for this course and BSCI 1510L or 1511L will not exceed 1 credit hours; total credit for this course and BSCI 1512L will not exceed 2 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Satisfies the AXLE lab course requirement when completed with 1100. [1] (No AXLE credit)

BSCI 1103. Green Earth: The Biodiversity and Evolution of Plants. [Formerly BSCI 118] Evolution of biodiversity from the Cambrian period through today. Theories and challenges of its conservation. Case studies drawn from Hawaii, Madagascar and Australia. Not intended for students planning to major in biological sciences. Not open to students who have earned credit for 1510 or 1511 without permission. Total credit for this course and 1510 or 1511 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (MNS)

BSCI 1103L. Green Earth Laboratory: The Biodiversity and Evolution of Land Plants. Not open to students who have earned credit for 1510L, 1511L, or 1512L without permission. Total credit for this course and 1510L or 1511L will not exceed 1 credit hour; total credit for this course and 1512L will not exceed 2 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Corequisite: 1103. Satisfies the AXLE lab course requirement when completed with 1103. [1]

BSCI 1105. Human Biology. [Formerly BSCI 105] Recent advances in genetics, reproduction, and biotechnology. Social, legal, and ethical implications. Three lectures and one laboratory period per week. Not intended for students majoring in Biological Sciences. Not open to students who have earned credit for BSCI 1510, 1510L, 1511, 1511L, or 1512L without permission. Total credit for this course and BSCI 1510, 1510L, 1511, or 1511L will not exceed 4 credit hours; total credit for this course and BSCI 1512L will not exceed 5 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [4] (MNS)

BSCI 1111. First-Year Writing Seminar. [Formerly BSCI 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

BSCI 1510. Introduction to Biological Sciences. [Formerly BSCI 110A] An integrative approach to the science of life for science and engineering students. Macromolecular structure and function. Cell structure, reproduction, metabolism, and energy production. Genomes, replication, gene structure, RNA, and protein synthesis. Not open to students who have earned credit for BSCI 1100, 1103, or 1105 without permission. Total credit for this course and BSCI 1100 or 1103 will not exceed 3 credit hours; total credit for this course and BSCI 1105 will not exceed 4 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: CHEM 1601. [3] (MNS)

BSCI 1510L. Biological Sciences Laboratory. [Formerly BSCI 111A] Laboratory to accompany 1510. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1510. Not open to students who have earned credit for BSCI 1100L, 1103L, or 1105 without permission. Total credit for this course and BSCI 1100L or 1103L will not exceed 1 credit hour; total credit for this course and BSCI 1105 will not exceed 4 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: 1510. [1] (No AXLE credit)

BSCI 1511. Introduction to Biological Sciences. [Formerly BSCI 110B] Continuation of 1510. Cell communication. Physiology, organ function and development. Mendelian and population genetics. Evolution, ecology, and speciation. Populations, ecosystems, and conservation biology. Not open to students who have earned credit for BSCI 1100, 1103, or 1105 without permission. Total credit for this course and BSCI 1100 or 1103 will not exceed 3 credit hours; total credit for this course and BSCI 1105 will not exceed 4 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1510. [3] (MNS)

BSCI 1511L. Biological Sciences Laboratory. [Formerly BSCI 111B] Laboratory to accompany 1511. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1511. Not open to students who have earned credit for BSCI 1100L, 1103L, 1105, or 1512L without permission. Total credit for this course and BSCI 1100L or 1103L will not exceed 1 hour; total credit for this course and BSCI 1105 will not exceed 4 hours; total credit for this course and BSCI 1512L will not exceed 2 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: 1511. [1] (No AXLE credit)

BSCI 1512L. Biological Sciences Laboratory. [Formerly BSCI 111C] Alternative to 1511L. Directed research projects with emphasis on experimental design and analysis. Satisfies the AXLE lab course requirement when completed with 1511. Offered on a graded basis only. Not open to students who have earned credit for BSCI 1100L, 1105, or 1511L without permission. Total credit for this course and BSCI 1100L or 1511L will not exceed 2 hours; total credit for this course and BSCI 1105 will not exceed 5 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: 1511. Prerequisite: 1510L. [2] (No AXLE credit)

BSCI 2056. Non-Equivalent Credit (BSCI Introductory Lab). [Formerly 71CT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Introductory Lab requirement of the BSCI major or minor.

BSCI 2060. Non-Equivalent Credit (BSCI/EEOB Intermediate Lab). [Formerly BSCI 72FT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Intermediate Lab requirement of the BSCI/EEOB major or minor.

BSCI 2201. Introduction to Cell Biology. [Formerly BSCI 201] Structure and function of cells, subcellular organelles, and macromolecules. Fundamentals of organelle function, membrane transport, energy production and utilization, cell motility, cell division, intracellular transport and mechanisms of signal transduction. Prerequisite: 1510. [3] (MNS)

BSCI 2201L. Cell Biology Laboratory. [Formerly BSCI 202] One three-hour laboratory and discussion period per week. Satisfies the AXLE lab course requirement when completed with 2201. Prerequisite or corequisite: 2201. [1] (No AXLE credit)

BSCI 2205. Evolution. [Formerly BSCI 205] Evolutionary theory, with emphasis on evolutionary mechanisms. Microevolutionary processes of adaptation and speciation and macro-evolutionary patterns. Evidence from genetics, ecology, molecular biology, and paleontology in the historical context of the neo-Darwinian synthesis. No credit for graduate students in Biological Sciences. Prerequisite: 1511. [3] (MNS)

BSCI 2210. Principles of Genetics. [Formerly BSCI 210] Basic principles and mechanisms of inheritance discussed and related to other biological phenomena and problems. Prerequisite: 1511. [3] (MNS)

BSCI 2210L. Genetics Laboratory. [Formerly BSCI 211] One three-hour laboratory and discussion period per week. Satisfies the AXLE lab course requirement when completed with 2210. Prerequisite or corequisite: 2210. [1] (No AXLE credit)

BSCI 2218. Introduction to Plant Biology. [Formerly BSCI 218] Diversity of plants within the framework of their evolution and environmental adaptations. Biomes from the tropical rain forest to the Vanderbilt arboretum. Three lectures and one laboratory per week. Prerequisite: 1511. [4] (MNS)

BSCI 2219. Introduction to Zoology. [Formerly BSCI 219] A structural and functional study of the major animal groups. The problems presented to animals by their environments, and the anatomical and physiological

mechanisms by which they adapt. Three lectures and one laboratory period per week. Prerequisite: 1511. [4] (MNS)

BSCI 2238. Ecology. [Formerly BSCI 238] Population biology, evolutionary ecology, community structure, with emphasis on species interactions, including competition, predation, and symbiosis. Prerequisite: 1511. [3] (MNS)

BSCI 2238L. Ecology Lab. [Formerly BSCI 237] One three-hour laboratory and discussion period or field trip per week. Satisfies the AXLE lab course requirement when completed with 2238. Prerequisite or corequisite: 2238. [1] (No AXLE credit)

BSCI 2520. Biochemistry. Structures and mechanisms of action of biological molecules, proteins, nucleic acids, lipids, and polysaccharides. Enzymology. Carbohydrate metabolism. Prerequisite: Either 1510 or CHBE 2150; and either CHEM 2211 or 2221. [3] (MNS)

BSCI 3226. Immunology. [Formerly BSCI 226] The molecular and cellular basis of immunity. Emphasis on molecular structure, the genetic origin of diversity in B-cell and T-cell receptors, antigen presentation, and the cellular interactions leading to the immune response. Tolerance, tumor and transplantation immunity, autoimmune and immunodeficiency diseases, and allergy. Prerequisite: 2201 or 2210. [3] (MNS)

BSCI 3228. Biodiversity: Great Barrier Reef and Rainforests of Australia. May session; two weeks on campus followed by two weeks in Australia. Origins. Threats to, and conservation of, populations and species. Serves as repeat credit for BSCI 3890 Section 01 Summer 2016. [3] (MNS)

BSCI 3230. Biological Clocks. [Formerly BSCI 230] Study of innate mechanisms for measurement of time in living organisms. Emphasis on the functional significance and physiological basis of biological clocks in animals and humans. Topics include circadian rhythms, time-compensated celestial navigation, photoperiodism, and the role of biological clocks in human behavior. Prerequisite: 1511. [3] (MNS)

BSCI 3232. Biodiversity, Climate Change and Our Health. Impacts of climate change on biological and ecological systems from the Paleozoic era to today. Inter-play of earth's systems, climate, and biological innovations. Effects on our natural resources, and consequences for our health. Prerequisite: 1511. [3] (MNS)

BSCI 3233. Conservation Biology. [Formerly BSCI 233] Ecological, evolutionary, social, and economic aspects of biodiversity loss and ecosystem disruption due to human activities. Climate change, habitat fragmentation, species overexploitation, and invasive species. Sustainable development, habitat restoration, and species reintroduction. Prerequisite: 1511. [3] (MNS)

BSCI 3234. Microbial Ecology and Evolution. [Formerly BSCI 234] Microorganisms, including bacteria, viruses, and mobile genetic elements. The origins and universality of microbial life, modes of genome evolution, symbioses between microbes and animals, biotechnology, and human microbiome. Prerequisite: 1511. [3] (MNS)

BSCI 3236. Parasitology. [Formerly BSCI 236] Biology and epidemiology of eukaryotic parasites of medical and veterinary significance. Diagnosis, treatment, and control of parasitic protists, platyhelminthes, nematodes, and arthropods. Impact on global health. Prerequisite: 1511. [3] (MNS)

BSCI 3239. Evolution of Behavior. [Formerly BSCI 239] Theoretical and empirical research on the evolution of behavior. Evolutionary approaches to the study of animal behavior, including the role of behavior in foraging, competition, predator-prey interactions, and sociality. Behavioral adaptations and their roles in sexual selection, mating systems, and animal communication. Prerequisite: 1511 and 2205. [3] (MNS)

BSCI 3243. Principles of Human Disease. [Formerly BSCI 243] Current understanding of diseases. Genetic, molecular, and cellular biological basis of disease. Connection between basic sciences and disease insights. Focus on obesity, aging, cancer, neurodegeneration, infections, and biomedical technology. [3] (MNS)

BSCI 3245. Biology of Cancer. [Formerly BSCI 245] Application of cell biology, molecular biology, and genetics to the study of cancer. Tumorigenesis; cellular oncogenes; growth factor signaling; tumor suppressor genes; apoptosis; metastasis and invasion. Prerequisite: 1511. [3] (MNS)

BSCI 3247. Molecular Evolution. [Formerly BSCI 247] The theory of evolution at the molecular level. The evolution of DNA and RNA sequences, proteins, and genome structures will be studied using models from population genetics and comparative approaches. Molecular clocks, the evolution of gene regulation and globin genes, molecular phylogeny, and human evolution. Prerequisite: 2210 and 2205. [3] (MNS)

BSCI 3252. Cellular Neurobiology. [Formerly BSCI 252] Structure and function of nerve cells. Emphasis on electrical excitability, synaptic transmission, and sensory transduction. Cellular mechanisms underlying simple behaviors, sensory information processing, and learning and memory. Prerequisite: 1511. [3] (MNS)

BSCI 3254. Neurobiology of Behavior. [Formerly BSCI 254] Nerve cell interactions in neuronal networks of the central nervous system of animals and their impact for regulating behavior. Sensory systems, sensory-motor integration, central processing of information, neuronal-hormonal interactions; and brain anatomy and organization in invertebrates and vertebrates. Prerequisite: BSCI 1511 or NSC 2201. [3] (MNS)

BSCI 3256. Molecules of the Brain. [Formerly BSCI 256] Molecules of neural wiring, involving cell identity, pathfinding, synaptogenesis. Molecules of nerve cell communication, with relationship to drugs of addiction and abuse. Molecules of nervous system plasticity, and the mechanistic bases of learning and memory. Relation of these mechanisms to causes of human neurological diseases. Prerequisite: 1511. [3] (MNS)

BSCI 3258. Vertebrate Physiology. [Formerly BSCI 258] Fundamental mechanisms of the major vertebrate physiological systems with an emphasis on humans. Special physiological adaptations of vertebrates to their environment (respiration of aquatic animals, birds, and deep diving mammals; salt balance in fresh and saltwater environments; altitude adaptation). Prerequisite: 2201 or 2520. [3] (MNS)

BSCI 3260. Vertebrate Biology. Comprehensive overview of the vertebrates. Morphology, physiology and behaviors; adaptations to specific environments, and the ecology, distribution and conservation of select groups. Key transformations leading to vertebrate diversity. Evolutionary history and relationships. No credit for students who earned credit for BSCI 3890 section 1 offered spring 2016 or spring 2017. Prerequisite: BSCI 1511. [3] (MNS)

BSCI 3270. Statistical Methods in Biology. [Formerly BSCI 270] An introduction to statistical methods used in the analysis of biological experiments, including the application of computer software packages. Emphasis on testing of hypotheses and experimental design. Topics include descriptive statistics, analysis of variance, regression, correlation, contingency analysis, and the testing of methods for sampling natural populations. Prerequisite: 1511. [3] (MNS)

BSCI 3272. Genome Science. [Formerly BSCI 272] Aims and importance of the science. Retrieval of genome data from public databases; experimental and computational methods used in analysis of genome data and their annotation. Functional aspects of genomics, transcriptomics, and proteomics; use of phylogenetics and population genomics to infer evolutionary relationships and mechanisms of genome evolution. Prerequisites: 1511. [3] (MNS)

BSCI 3850. Independent Reading. [Formerly BSCI 282] Reading and discussion of research papers with a member of the faculty. Prerequisite: consent of Biological Sciences 3850 coordinator before the end of the previous semester. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1; maximum of 2 credits total for all semesters of BSCI 3850] (No AXLE credit)

BSCI 3860. Introduction to Research. [Formerly BSCI 280] Work in the laboratory of a member of the Biological Sciences faculty. Term paper required. Consent of course coordinator and enrollment by arrangement before the end of the previous semester is required. Prerequisite: 1510. Prerequisite or corequisite: 1511. [1] (No AXLE credit)

BSCI 3861. Directed Laboratory Research. [Formerly BSCI 283] Directed student research on a project conceived by a member of the Biological Sciences faculty. Enrollment by arrangement before the end of the previous semester. May be taken only once, and participants ordinarily expected to

have overall grade point average of B or better. Offered on a graded basis only. Prerequisite: 1511, one intermediate BSCI course appropriate to the major or 3860, and consent of Biological Sciences 3861 coordinator. [2-4] (No AXLE credit)

BSCI 3890. Special Topics in Biological Sciences. [Formerly BSCI 290] Topics vary. May be repeated for credit more than once by permission of the director of undergraduate studies. Students may enroll in more than one section of this course each semester. Prerequisite: 1511. [3] (MNS)

BSCI 3961. Independent Laboratory Research. [Formerly BSCI 286] Original student research on a defined problem in Biological Sciences and under the supervision of Biological Sciences faculty. Some independence in the design and execution of the problem. Enrollment by arrangement before the end of the previous semester. Prerequisite: 3861, consent of Biological Sciences 3961 coordinator, cumulative grade point average of B. May be repeated for credit more than once, but students may earn only up to 6 credits per semester of enrollment. [2-6] (No AXLE credit)

BSCI 3965. Undergraduate Seminar. [Formerly BSCI 275] Discussions and papers based on readings in research journals. Topics vary. Prerequisite: fulfillment of the intermediate course requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but only two hours may count toward the major. Students may enroll in more than one section of this course each semester. [2] (No AXLE credit)

BSCI 4265. Biochemistry II. [Formerly BSCI 265] Mechanisms and interactions of biological molecules involved in maintenance of genetic information and cellular homeostasis. Prerequisite: 2520. [3] (MNS)

BSCI 4266. Advanced Molecular Genetics. [Formerly BSCI 266] Principles of classical and molecular genetic analysis: mutation and recombination, mapping, and the application of genetic methodology to the study of complex systems. Special emphasis on modern genomic approaches. Prerequisite: 2210. [3] (MNS)

BSCI 4274. Proteins. [Formerly BSCI 274] Molecular structures and biological functions of proteins. Underlying chemical and physical properties. Structural motifs and topology; folding and dynamics; enzyme catalysis; protein-DNA interactions. Structure-based drug design; protein symmetry; supramolecular protein machines. Chemical and spectroscopic methods to probe protein structure and behavior in solution. Prerequisite: 2520. [3] (MNS)

BSCI 4999. Honors Research. [Formerly BSCI 296] Open only to majors in the Honors Program. May be repeated for credit more than once, but students may earn only up to 6 credits per semester of enrollment. [4-6] (No AXLE credit)

Catalan

CTLN 1103. Intensive Elementary Catalan. [Formerly CTLN 102] Romance tongue of northeastern Spain, Andorra, and southwestern France. Emphasis on oral communication, grammar, reading, and culture. Prior study of another Romance language through the intermediate level is expected. No credit for students who have earned credit for a higher level Catalan language course. [3] (INT)

Chemistry

CHEM 1001. Commons iSeminar. [Formerly CHEM 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

CHEM 1010. Introductory Chemistry. [Formerly CHEM 101A] General principles for non-science majors or those not planning on taking additional chemistry courses. The periodic table, chemical reactions, properties of solutions, and atmospheric chemistry with connections to global environmental issues. No prior chemistry experience required. Not a prerequisite for advanced courses in chemistry. Not open to students who have earned credit for CHEM 1601, 2211, or 2221 without permission. Total credit for this course and 1601, 2211, or 2221 will not exceed 3 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [3] (MNS)

CHEM 1010L. Introductory Chemistry Laboratory. [Formerly CHEM 100A] Laboratory to accompany 1010. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1010. Not open to students who have earned credit for CHEM 1601L or 2221L without permission. Total credit for this course and 1601L or 2221L will not exceed 1 credit hour. Credit reduced from second course taken (or test or transfer credit) as appropriate. Corequisite: 1010. [1] (No AXLE credit)

CHEM 1020. Introductory Chemistry. [Formerly CHEM 101B] General principles for non-science majors or those not planning on taking additional chemistry courses. Chemistry of water, basic nuclear chemistry, organic and biochemistry, with discussion of the chemistry of common medicines and nutritional chemistry. No prior chemistry experience required. Not a prerequisite for advanced courses in chemistry. Not open to students who have earned credit for CHEM 1602, 2212, or 2222 without permission. Total credit for this course and 1602, 2212, or 2222 will not exceed 3 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [3] (MNS)

CHEM 1020L. Introductory Chemistry Laboratory. [Formerly CHEM 100B] Laboratory to accompany 1020. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1020. Not open to students who have earned credit for CHEM 1602L or 2222L without permission. Total credit for this course and 1602L or 2222L will not exceed 1 credit hour. Credit reduced from second course taken (or test or transfer credit) as appropriate. Corequisite: 1020. [1] (No AXLE credit)

CHEM 1111. First-Year Writing Seminar. [Formerly CHEM 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

CHEM 1601. General Chemistry. [Formerly CHEM 102A] General principles of chemistry for science and engineering students. Composition and structure of matter, chemical reactions, bonding, solution chemistry, and kinetics. Thermodynamics, equilibrium, acids and bases, electrochemistry, and coordination compounds. Three lectures per week and a recitation period. Not open to students who have earned credit for CHEM 1010 without permission. Serves as repeat credit for 1010. Corequisite: 1601L. [3] (MNS)

CHEM 1601L. General Chemistry Laboratory. [Formerly CHEM 104A] Laboratory to accompany 1601. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1601. Not open to students who have earned credit for CHEM 1010L without permission. Serves as repeat credit for CHEM 1010L. Prerequisite or corequisite: 1601. [1] (No AXLE credit)

CHEM 1602. General Chemistry. [Formerly CHEM 102B] Continuation of 1601. General principles of chemistry for science and engineering students. Composition and structure of matter, chemical reactions, bonding, solution chemistry, and kinetics. Thermodynamics, equilibrium, acids and bases, electrochemistry, and coordination compounds. Three lectures per week and a recitation period. Not open to students who have earned credit for CHEM 1020 without permission. Serves as repeat credit for 1020. Prerequisite: 1601. Corequisite: 1602L. [3] (MNS)

CHEM 1602L. General Chemistry Laboratory. [Formerly CHEM 104B] Laboratory to accompany 1602. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1602. Not open to students who have earned credit for CHEM 1020L without permission. Serves as repeat credit for CHEM 1020L. Prerequisite: 1601L. Corequisite: 1602. [1] (No AXLE credit)

CHEM 2100. Introduction to Analytical Chemistry. [Formerly CHEM 210] Fundamental quantitative analytical chemistry with emphasis on principles of analysis, separations, equilibria, stoichiometry and spectrophotometry. Corequisite: 2100L. [3] (MNS)

CHEM 2100L. Analytical Chemistry Laboratory. [Formerly CHEM 212A] Laboratory to accompany Chemistry 2100. One four-hour labora-

tory per week. Satisfies the AXLE lab course requirement when completed with 2100. Prerequisite or corequisite: 2100. [1] (No AXLE credit)

CHEM 2211. Organic Chemistry for Advanced Placement Students. [Formerly CHEM 218A] Fundamental types of organic compounds; their nomenclature, classification, preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Not open to students who have earned credit for CHEM 2221. Total credit for this course and CHEM 2221 will not exceed 3 credit hours. Prerequisite: enrollment limited to first-year students with advanced placement chemistry scores of 5, or the approval of the director of undergraduate studies. Corequisite: 2221L. [3] (MNS)

CHEM 2212. Organic Chemistry for Advanced Placement Students. [Formerly CHEM 218B] Continuation of 2211. Fundamental types of organic compounds; their nomenclature, classification, preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Not open to students who have earned credit for CHEM 2222. Total credit for this course and CHEM 2222 will not exceed 3 hours. Prerequisite: enrollment limited to first-year students with advanced placement chemistry scores of 5, or 2211, or the approval of the director of undergraduate studies. Corequisite: 2222L. [3] (MNS)

CHEM 2221. Organic Chemistry. [Formerly CHEM 220A] Fundamental types of organic compounds. Nomenclature and classification. Preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Serves as repeat credit for CHEM 2211. No credit for graduate students in chemistry. Prerequisite: 1602. Corequisite: 2221L. [3] (MNS)

CHEM 2221L. Organic Chemistry Laboratory. [Formerly CHEM 219A] Laboratory to accompany 2211 or 2221. One four-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 2211 or 2221. Prerequisite or corequisite: 2211 or 2221. [1] (No AXLE credit)

CHEM 2222. Organic Chemistry. [Formerly CHEM 220B] Continuation of 2221. Fundamental types of organic compounds. Nomenclature and classification. Preparations, reactions, and general application. Three hours of lecture and one hour of recitation each week. Serves as repeat credit for CHEM 2212. Prerequisite: 2211 or 2221. Corequisite: 2222L. [3] (MNS)

CHEM 2222L. Organic Chemistry Laboratory. [Formerly CHEM 219B] Laboratory to accompany 2212 or 2222. One four-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 2212 or 2222. Prerequisite or corequisite: 2212 or 2222. [1] (No AXLE credit)

CHEM 2610. Introduction to Nanochemistry. [Formerly CHEM 240] Synthesis, characterization, and assembly of nanoscale materials. No credit for graduate students in chemistry. Prerequisite: 1602. [3] (MNS)

CHEM 3010. Inorganic Chemistry. [Formerly CHEM 203] A survey of modern inorganic chemistry including coordination compounds and the compounds of the main-group elements. Representative reactions and current theories are treated. Prerequisite or corequisite: 3300 or 3310. [3] (MNS)

CHEM 3020. Introduction to Bioinorganic Chemistry. [Formerly CHEM 202] Functions of inorganic elements in living cells. The manner in which coordination can modify the properties of metallic ions in living systems. Prerequisite: 2212 or 2222. [3] (MNS)

CHEM 3120. Instrumental Analytical Chemistry. [Formerly CHEM 211] Chemical and physical principles of modern analytical chemistry instrumentation. Prerequisite: 2100 and either 2212 or 2222. [3] (MNS)

CHEM 3135W. Forensic Analytical Chemistry. [Formerly CHEM 227W] Techniques, methodologies, data collection, and interpretation. Laboratory experience with drug analysis, toxicology, trace, and arson analysis. Two hours of lecture and one four-hour laboratory per week. Prerequisite: 2100 and 2100L. [3] (MNS)

CHEM 3220. Spectroscopic Identification of Organic Compounds. [Formerly CHEM 225] Theoretical and practical aspects of spectroscopic methods, with an emphasis on NMR spectroscopy, for structural characterization of organic compounds. Prerequisite: 2212 or 2222. [3] (MNS)

CHEM 3300. Physical Chemistry: Quantum Mechanics, Spectroscopy, and Kinetics. [Formerly CHEM 230] Chemical kinetics and principles of quantum chemistry applied to molecular structure, bonding, and spectroscopy. Prior study of multivariable calculus is expected. No credit for graduate students in chemistry. Prerequisite or corequisite: PHYS 1501, 1601, or 1901. Prerequisite: MATH 1201 or 1301. [3] (MNS)

CHEM 3310. Biophysical Chemistry: Thermodynamics in Chemical and Biological Systems. [Formerly CHEM 231] Chemical thermodynamics and equilibrium, their statistical foundation, and applications to chemical and biological phenomena in biomedical research. Prerequisite or corequisite: PHYS 1501, 1601, or 1901. Prerequisite: MATH 1201 or 1301. [3] (MNS)

CHEM 3315. Physical Chemistry Laboratory. [Formerly CHEM 236] Experiments in chemical thermodynamics and kinetics. Data analysis and presentation. No credit for graduate students in chemistry. One three-hour laboratory or one lecture per week. Calculus through Math 2300 recommended. Prerequisite: 2222L and either MATH 1201 or 1301. [1] (No AXLE credit)

CHEM 3600. Chemical Literature. [Formerly CHEM 250] Assigned readings and problems in the nature and use of the chemical literature. Prerequisite: 2212 or 2222. [1] (No AXLE credit)

CHEM 3630. Macromolecular Chemistry: Polymers, Dendrimers, and Surface Modifications. [Formerly CHEM 235] Synthesis and characterization of macromolecular materials including linear, branched, dendritic, and star polymers. Mechanical and physicochemical properties of polymeric types. Kinetics of living polymerization. Applications to nanostructures, templates, and advanced devices. Prerequisite: 1602. [3] (MNS)

CHEM 3710. Bioorganic Chemistry. [Formerly CHEM 224] Essential metabolites including vitamins, steroids, peptides, and nucleotides. Consideration of phosphate esters and the synthesis of oligodeoxynucleotides. Three lectures per week. Prerequisite: 2212 or 2222. [3] (MNS)

CHEM 3715. Chemistry of the Coral Reef. Application of quantitative analytical chemistry techniques and spectroscopic methods to characterize molecules with potential materials chemistry or medicinal chemistry applications. In-depth chemistry research experience; mandatory participation in all scheduled field research and laboratory sessions. Prerequisite: 2100, 2100L, 2222, 2222L [3] (MNS)

CHEM 3841. Readings for Honors. [Formerly CHEM 291A] Open only to students in the departmental honors program. General reading supervised by research adviser. [2] (No AXLE credit)

CHEM 3842. Readings for Honors. [Formerly CHEM 291B] Open only to students in the departmental honors program. Continuation of 3841, with emphasis on research planned. [2] (No AXLE credit)

CHEM 3860. Undergraduate Research. [Formerly CHEM 282] Open to students who have earned at least 8 hours of credit and a minimum GPA of 2.7 in chemistry, with consent of the director of undergraduate studies and the sponsoring faculty member. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

CHEM 3980. Honors Research. [Formerly CHEM 292A] Open only to students in the departmental honors program. Original research supervised by research adviser, to be reported in thesis form with oral examination thereon. [2-4]

CHEM 4050. Introduction to Organometallic Chemistry. A general description of the preparation, reaction chemistry, molecular structure, bonding, and spectroscopic identification of organometallic compounds of the transition metals. Prerequisite: 3010 or 3020. [3] (MNS)

CHEM 4210. Organic Chemistry Structure and Mechanism. [Formerly CHEM 220C] Stereochemistry and conformational analysis; mechanisms of organic reactions; linear free-energy relationships; reactive intermediates. Three lectures and one recitation hour per week. Serves as repeat credit for CHEM 5210. Not open to students who have earned credit for 5209 without permission. Total credit for this course and CHEM 5209 will not exceed 4 hours. Credit reduced from most recent course taken (or from

test or transfer credit) as appropriate. Prerequisite: either 2212 or 2222 and either 3300 or 3311. [4] (MNS)

CHEM 4230. Physical Organic Chemistry. Structure and bonding in organic molecules. Reactive intermediates and organic reaction mechanisms. Prerequisite: 3300 or 3310. [3] (MNS)

CHEM 4240. Advanced Organic Reactions. [Formerly CHEM 223] A comprehensive study of organic reactions and their application to the preparation of small molecules. Prerequisite: 4210. Three lectures per week. [3] (MNS)

CHEM 4350. Statistical Thermodynamics. Statistical mechanics and chemical equilibrium. Distribution laws, partition functions, and thermodynamic properties of atoms and molecules. Applications to gases, liquids, and solids. Prerequisite: either 3300 or 3310, and Math 2300. [3] (MNS)

CHEM 4720. Drug Design and Development. [Formerly CHEM 226] Concepts of drug design; physical chemistry of drug interactions with receptors, enzymes, and DNA; drug absorption and distribution. Organic chemistry of drug metabolism; mechanism of action for selected therapeutic classes. Prerequisite: 3710 or BSCI 2520. [3] (MNS)

CHEM 4965. Advanced Integrated Laboratory. [Formerly CHEM 295A] Multidisciplinary laboratory projects. Experimental design, synthetic techniques, chemical analysis, spectroscopy, and computational methods. Offered on a graded basis only. Limited to senior majors. Prerequisite: 2100, 2100L. [3] (No AXLE credit)

CHEM 4966. Advanced Integrated Laboratory. [Formerly CHEM 295B] Continuation of 4965. Offered on a graded basis only. Limited to senior majors. Prerequisite: 4965. [3] (No AXLE credit)

CHEM 4980. Honors Research. Open only to students in the departmental honors program. Original research supervised by research adviser, to be reported in thesis form with oral examination thereon. [2-4] (No AXLE credit)

CHEM 4999. Honors Research. [Formerly CHEM 292C] Open only to students in the departmental honors program. Original research supervised by research adviser, to be reported in thesis form with oral examination thereon. [2] (No AXLE credit)

Chinese

CHIN 1011. Basic Chinese. [Formerly CHIN 200A] Designed exclusively for students with no previous exposure to the language. The basic pronunciation, grammar, and writing system of Mandarin Chinese. Simple conversation, the pinyin Romanization system, basic Chinese characters, and cultural elements embedded in the language. No credit for students who have earned credit for 1101 or a more advanced Chinese language course. [3] (No AXLE credit)

CHIN 1012. Basic Chinese. [Formerly CHIN 200B] Continuation of 1011. No credit for students who have earned credit for 1101 or a more advanced Chinese language course. Prerequisite: 1011. [3] (No AXLE credit)

CHIN 1101. Elementary Chinese I. [Formerly CHIN 201] Introduction to Modern Chinese pronunciation, grammar, conversation, reading, and writing. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for 1012 or a more advanced Chinese language course. [5] (No AXLE credit)

CHIN 1102. Elementary Chinese II. [Formerly CHIN 202] Continuation of 1101. Introduction to Modern Chinese pronunciation, grammar, conversation, reading, and writing. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 1012 or 1101. [5] (INT)

CHIN 1231. Calligraphy. [Formerly CHIN 231] Basic skills of writing standard script kaishu. Basic aesthetic of Chinese calligraphy. No Chinese language background necessary. [1] (No AXLE credit)

CHIN 2201. Intermediate Chinese I. [Formerly CHIN 211] Oral and written language training. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 1102. [5] (INT)

CHIN 2202. Intermediate Chinese II. [Formerly CHIN 212] Continuation of 2201. Language training in oral and written Chinese. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 2201. [5] (INT)

CHIN 2211. Chinese for Heritage Learners I. [Formerly CHIN 225] Intended for students who have some informal training in listening and speaking Mandarin Chinese. Basic literacy and other aspects of language proficiency. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Chinese language course. [3] (INT)

CHIN 2212. Chinese for Heritage Learners II. [Formerly CHIN 226] Continuation of 2211. Intended for students who have some informal training in listening and speaking Mandarin Chinese. Basic literacy and other aspects of language proficiency. Offered on a graded basis only. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 2211. [3] (INT)

CHIN 3301. Advanced Chinese I. [Formerly CHIN 241] Readings in Chinese culture to enhance proficiency in oral and written Chinese. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 2202. [3] (INT)

CHIN 3302. Advanced Chinese II. [Formerly CHIN 242] Continuation of 3301. Readings in Chinese culture to enhance proficiency in oral and written Chinese. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 3301. [3] (INT)

CHIN 3302W. Advanced Chinese II. [Formerly CHIN 242W] Reading and writing essays about modern Chinese culture and society. Repeat credit for 3302. No credit for students who have earned credit for a more advanced Chinese language course. Graded basis only. Prerequisite: 3301. [3] (INT)

CHIN 3851. Independent Study. [Formerly CHIN 289A] Designed primarily for majors who want to study Chinese not regularly offered in the curriculum. Must have consent of instructor. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum 12 credits total for all semesters of CHIN 3851 and 3852] (No AXLE credit)

CHIN 3852. Independent Study. [Formerly CHIN 289B] Designed primarily for majors who want to study Chinese not regularly offered in the curriculum. Must have consent of instructor. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum 12 credits total for all semesters of CHIN 3851 and 3852] (No AXLE credit)

CHIN 4401. Business Chinese I. [Formerly CHIN 255] Language skills for listening, speaking, reading, and writing in business environments. Modern China from economic and business perspectives. No credit for students who have earned credit for a more advanced Chinese language course. Prerequisite: 3302 or 3302W. [3] (INT)

CHIN 4402. Business Chinese II. [Formerly CHIN 256] Continuation of 4401. Language skills for listening, speaking, reading, and writing in business environments. Modern China from economic and business perspectives. Prerequisite: 4401. [3] (INT)

CHIN 4403. Readings in Modern Chinese Media. [Formerly CHIN 251] Books, newspapers, Internet, and television documents and productions pertaining to political, social, and economic issues in China, including foreign trade-related issues. Prerequisite: 3302 or 3302W. [3] (INT)

CHIN 4404. Readings in Modern Chinese Media. [Formerly CHIN 252] Continuation of 4403. Books, newspapers, and Internet sources pertaining to political, social, and cultural issues. Prerequisite: 3302 or 3302W. [3] (INT)

CHIN 4405. Classical Chinese Literature and Philosophy. [Formerly CHIN 253] Classical writings by Confucius, Sunzi, and Zhuangzi. Poems by Li Bai and Du Fu. Excerpts from *The Dream of the Red Chamber*. Linguistic comparisons between classical and modern Chinese. Prerequisite: 3302 or 3302W. [3] (INT)

CHIN 4406. Readings in Modern Literary Chinese. [Formerly CHIN 254] 1910 to the present. Chinese literature and poetry. Linguistic transformations that produced modern literary Chinese. Prerequisite: 3302 or 3302W. [3] (INT)

Cinema and Media Arts

CMA 1001. Commons iSeminar. [Formerly CMA 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

CMA 1002W. Moving Images and Analytical Thinking. Moving images and new media from various genres, periods, and national contexts. May be repeated for credit once if there is no duplication in topic. Offered on a graded basis only. [3] (HCA)

CMA 1111. First-Year Writing Seminar. [Formerly CMA 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

CMA 1500. Fundamentals of Film and Video Production. [Formerly CMA 105] Technologies and techniques of filmmaking. Digital video cameras, staging and lighting, sound recording, post-production sound, and image editing. Offered on a graded basis only. [3] (HCA)

CMA 1600. Introduction to Film and Media Studies. [Formerly CMA 125] Stylistic tendencies and narrative strategies, genres, and theoretical approaches. Live-action cinema, animation, experimental cinema, television, and computer-generated moving images. [3] (HCA)

CMA 2250. 16mm Filmmaking. Camera operation, lighting, non-sync sound design, and film pre-production for 16 mm and celluloid film. Offered on a graded basis only. Prerequisite 1500. [3] (No AXLE credit)

CMA 2260. Digital Production Workshop. Digital cinematography, sound design, and editing. Individual and group projects. Offered on a graded basis only. Prerequisite 1500. [3] (No AXLE credit)

CMA 2300. Film and Media Theory. [Formerly CMA 201] Historical overview of the major analytical and critical approaches to the study of film as an aesthetic and cultural form. Contemporary perspectives on cinema, video, and new media. Prerequisite: 1600. [3] (P)

CMA 2400. History of World Cinema. [Formerly CMA 211] Survey of world film history from 1895 to the present. Key films and filmmakers. Historical, aesthetic, national, and political contexts of films and film movements. Prerequisite: 1600. [3] (HCA)

CMA 2500W. Screenwriting. [Formerly CMA 227W] Techniques of screenwriting. [3] (HCA)

CMA 2600W. Advanced Screenwriting. [Formerly FILM 275W] Story structure, character development, and dialogue. Prerequisite: 2500W. [3] (HCA)

CMA 3770. Russian Cinema. Masterpieces of Russian and Soviet cinema from the silent period to the present. Montage theory, propaganda film, politics of the art house, and rise of the Russian blockbuster. Films by master directors Eisenstein, Vertov, Tarkovsky, Sokurov, and Zvyagintsev. Soviet musicals and contemporary popular cinema. Knowledge of Russian not required. [3] (INT)

CMA 3771. Global Korean Cinema. From the colonial period to the Korean Wave in the new millennium. Film criticism, transnational and national contexts of film production, aesthetics of auteurs and genres, and local and global receptions of Korean cinema. [3] (INT)

CMA 3772. French and Francophone Cinema. The themes and art of film in France and the French-speaking world. Offered in French at Vanderbilt in France and in English at Nashville. When offered in English, this course does not count toward the minor, and writing must be done in French to count toward the major. [3] (INT)

CMA 3850. Independent Study. [Formerly CMA 289A] Projects are arranged with individual professors and must be confirmed by the director

of Cinema and Media Arts within two weeks of the beginning of classes; otherwise the student will be dropped from the rolls. [Variable credit: 1-3 each semester. Limit of 6 hours for 3850 and 3851 combined for majors.] (No AXLE credit)

CMA 3851. Independent Study. [Formerly FILM 289B] Projects are arranged with individual professors and must be confirmed by the director of Cinema and Media Arts within two weeks of the beginning of classes; otherwise the student will be dropped from the rolls. [Variable credit: 1-3 each semester. Limit of 6 hours for 3850 and 3851 combined for majors.] (No AXLE credit)

CMA 3880. Internship Training. [Formerly CMA 280B] Under faculty supervision, students from any discipline can gain experience working on projects related to film and media in public or private organizations. Responsibilities include conducting background research and developing skills in film and media study and production. Hours for background readings and research will be completed in CMA 3881 concurrently with 3880. Normally a 2.90 grade point average, 6 hours of prior work in Cinema and Media Arts, and approval of the student's plan by the director of undergraduate studies are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 will not count toward the Film Studies Major or minor. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

CMA 3881. Internship Readings and Research. [Formerly CMA 280A] Under faculty supervision, students from any discipline can gain experience working on projects related to film and media in public or private organizations. Responsibilities include conducting background research and developing skills in film and media study and production. Hours for background readings and research will be completed in CMA 3881 concurrently with CMA 3880. Normally a 2.90 grade point average, 6 hours of prior work in Cinema and Media Arts, and approval of the student's plan by the director of undergraduate studies are required. A research paper and report must be submitted at the end of the semester during which the internship training is completed. Readings and research conducted under the supervision of a member of the Cinema and Media Arts program and a substantial research paper or written project (such as a screenplay, treatment, or production plan related to the Training component) is required. Corequisite: 3880. [Variable credit: 1-6] (No AXLE credit)

CMA 3891. Special Topics in Film and Video Production. [Formerly CMA 288A] Topics vary. May be repeated more than once if there is no duplication of topic. Prerequisite: 1500. [3] (No AXLE credit)

CMA 3892. Special Topics in the Study of Film. [Formerly CMA 288B] Topics vary. May be repeated more than once if there is no duplication of topic. [3] (HCA)

CMA 3893. Special Topics in National Cinema and Movements. Major directors, genres, styles of film-making in a specific national context. May be repeated for credit more than once if there is no duplication in topic. [3] (HCA)

CMA 4961. Senior Seminar on Criticism, Theory, and History. [Formerly CMA 290A] Advanced reading and research in film. Offered on a graded basis only. Prerequisite: 1600 and senior standing. [3] (No AXLE credit)

CMA 4962. Senior Seminar on Film Practice. [Formerly CMA 290B] Advanced independent filmmaking, portfolio assembly, and professionalism. Offered on a graded basis only. Prerequisite: 1500 and senior standing. [3] (No AXLE credit)

CMA 4998. Senior Honors Research. [Formerly CMA 299A] Acquisition, reading, and analysis of primary source research material. Open only to senior honor students. [3] (No AXLE credit)

CMA 4999. Senior Honors Thesis. [Formerly CMA 299B] Writing a thesis under the supervision of the thesis advisor. Open only to senior honor students. Prerequisite: 4998. [3] (No AXLE credit)

Classical Hebrew

CHEB 1101. Beginning Classical Hebrew I. Alphabet, basic grammar, and vocabulary. Short readings from the Bible. No credit for students who have earned credit for a more advanced Classical Hebrew language course. Offered on a graded basis only. [3] (No AXLE credit)

CHEB 1102. Beginning Classical Hebrew II. Transition to extensive reading of the Bible. No credit for students who have earned credit for a more advanced Classical Hebrew language course. Offered on a graded basis only. Prerequisite: 1101. [3] (INT)

CHEB 2200. Intermediate Classical Hebrew. Review of grammar and expanding vocabulary. Selected readings in prose and poetry from the Bible. No credit for students who have earned credit for a more advanced Classical Hebrew language course. Prerequisite: 1102. [3] (INT)

CHEB 2300. Ugaritic. Orthography, phonology, morphology, and syntax. Introduction to approaches of comparative Semitics and historical Hebrew grammar. Selected readings from various genres illustrating language and literature of ancient Canaan. Prerequisite: 1102. [3] (INT)

CHEB 3010. Historical Hebrew Grammar. Linguistic origins and development within Northwest Semitic subgroup. Phonology, morphology, and lexicon. Theory and method in historical linguistics and comparative Semitics. Selected readings in literary, documentary, and epigraphic texts. Prerequisite: 2200. [3] (HCA)

CHEB 3020. Classical Hebrew Poetry. History and genres of ancient verse. Selected readings from the Bible, including Job and Psalms. Prerequisite: 2200. [3] (HCA)

CHEB 3030. West Semitic Inscriptions. Orthography, phonology, morphology, and syntax. Studying Hebrew, Aramaic, Phoenician, and Moabite epigraphic texts. Theory and method in historical linguistics and comparative Semitics. Prerequisite: 2200. [3] (HCA)

Classics

CLAS 1001. Commons iSeminar. [Formerly CLAS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

CLAS 1010. Introduction to Mediterranean Studies. History and geography of southern Europe, north Africa, and Near East from Iron Age through Middle Ages (ca. 1000 BCE-1500 CE). Greeks, Romans, and related peoples. Abrahamic religions. Case studies in complexity and change, community and identity, innovation and prosperity, power and conflict, and environment and cosmos. Cultural transmission and reception. [3] (INT)

CLAS 1020. Introduction to Mediterranean Archaeology. Iron Age through Middle Ages (ca. 1000 BCE-1500 CE). Remains of Greeks, Romans, and related peoples of southern Europe, north Africa, and the Near East. Society, economy, religion, urbanism. Human settlement and natural environment. Classical and Renaissance paradigms. Modern theory of material and visual culture. Techniques of data collection, analysis, and curation [3] (SBS)

CLAS 1111. First-Year Writing Seminar. [Formerly CLAS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

CLAS 1120. Greek Civilization. [Formerly CLAS 130] A survey of the history and achievements of Greece from its Mycenaean origins to the Roman domination. Topics include literature, art, athletics, Periclean Athens, the conquest of Alexander, and the Hellenistic age. [3] (INT)

CLAS 1130. The Greek Myths. [Formerly CLAS 150] A study of the nature of the Greek myths, with consideration of the related Near Eastern myths and the early history of myths in Greece. Both the divine and the heroic myths, with some attention to the development of these myths in Italy and to their influence upon art and literature. [3] (HCA)

CLAS 1150. Roman Civilization. [Formerly CLAS 146] Ancient Roman civilization from mythical foundations to the fall of the empire. A historical survey of topics including art and architecture, city life, agriculture, religion, law, slavery, public entertainment, and literature. [3] (INT)

CLAS 1200W. Classics and Contemporary Culture. Reception and appropriation of Greco-Roman culture by the Western world and its relationship to contemporary critical issues. Sociopolitical concerns, including racism, colonialism, and political extremism. Offered on a graded basis only. [3] (P)

CLAS 2100. History of the Ancient Near East. [Formerly CLAS 207] From the neolithic period to the conquests of Alexander the Great, in the geographical area from Persia to Troy and Egypt. Special attention to the history of Israel. [3] (INT)

CLAS 2110. History of Greece to Alexander the Great. [Formerly CLAS 208] The Greek world from the beginning of the Mycenaean Age (1650 B.C.) to the end of the Classical period. Special attention to the relationship between political history and the development of Hellenism. [3] (INT)

CLAS 2120. The Greek World from Alexander the Great to the Roman Empire. The eastern Mediterranean from the rise of Macedon and Alexander the Great to the High Roman Empire. Social, cultural, political, and religious changes. Issues of imperialism and colonialism, and questions of identity in a geographically expansive Greek world. [3] (INT)

CLAS 2150. History of the Roman Republic. [Formerly CLAS 212] The growth and evolution of the Roman world, from the foundation of the city in the seventh century B.C. to the reign of Caesar Augustus. The Romans' unification of Italy, conquest of the Mediterranean and western Europe, adoption of Hellenism, and overthrow of the Republic. [3] (INT)

CLAS 2160. History of the Roman Empire. [Formerly CLAS 213] The Roman world from Augustus to the collapse of the western empire in the fifth century. Political, military, social, and religious history. Special attention given to problems arising from use of the primary sources as well as to controversies in modern scholarship. [3] (INT)

CLAS 2180. The Mediterranean World from Late Antiquity to the Middle Ages. [Formerly CLAS 223] Eastern Roman Empire from Constantine to Arab conquests. Political, social, cultural, and religious history, including monasticism, barbarian invasions, changing roles of Emperor and Church, and birth of Islam. Developments in urban life and landscape. [3] (INT)

CLAS 2200. Archaic and Classical Greek Art and Architecture, 1000 to 400 B.C.E. [Formerly CLAS 204] Sculpture, vase painting, architecture, and the minor arts. Formal and stylistic developments in relation to changing cultural background. [3] (HCA)

CLAS 2210. Late Classical Greek and Hellenistic Art and Architecture. [Formerly CLAS 205] Sculpture, vase painting, architecture, and the minor arts from after the Parthenon to the Roman Empire. Media that developed significantly in this period, such as wall painting and mosaic. [3] (HCA)

CLAS 2250. Roman Art and Architecture. [Formerly CLAS 206] Sculpture, architecture, and painting from the tenth century B.C.E. to the early fourth century C.E. Daily life of the Romans as seen in excavations of the towns of Pompeii and Herculaneum. [3] (HCA)

CLAS 3000. Classical Tradition in America. [Formerly CLAS 222] Influences of classical Greece and Rome on the literature, politics, architecture, and values of the United States from the colonial period to the present. [3] (US)

CLAS 3010. The Ancient Origins of Religious Conflict in the Middle East. [Formerly CLAS 224] Religious oppositions in the eastern Mediterranean world from the Maccabean revolt to the Muslim conquests of the seventh century; beginnings of religious militancy; challenges of monotheism to Greco-Roman civilization; conversion, persecution, and concepts of heresy and holy war in Christianity, Judaism, and Islam. [3] (P)

CLAS 3030. Death, Disease, and Health in the Ancient World. From the Bronze Age to early Christianity and Late Antiquity. Biological history of the Greeks, Romans, and other Mediterranean peoples. Changing concepts of death and afterlife; interpretations of disease; medical thought and

practice. Healing, epidemics, natural catastrophe, and dietary variation. Evidence from classical literature, archaeology, bones and teeth. [3] (SBS)

CLAS 3100. Women, Sexuality, and the Family in Ancient Greece and Rome. [Formerly CLAS 220] The status and role of women, law and the regulation of the private sphere, sexuality and gender roles, demography and family structure, marriage, children, religion, domestic architecture and the household economy, ancient critiques of the family, and the impact of Christianity. [3] (SBS)

CLAS 3110. Warfare in the Ancient Mediterranean. [Formerly CLAS 226] Continuity and change in ancient Greek and Roman warfare 800 B.C. to A.D. 120. Social, political, and religious aspects of war. Effects of war, imperialism, and militarism on internal and external populations. [3] (INT)

CLAS 3120. Humor, Ancient to Modern. [Formerly CLAS 225] Ancient comic forms juxtaposed with modern theories of humor. Aristophanic Old Comedy, New Comedy, and Satire. Modern parallels. [3] (HCA)

CLAS 3150. Roman Law. [Formerly CLAS 260] The relationship between law and society as illustrated by cases drawn from Roman legal and literary sources. The development of legal reasoning and the rise of an autonomous legal profession at Rome. [3] (SBS)

CLAS 3160. Roman Law and Social History. Relationship of law and society as illustrated by legal, literary, epigraphic, and papyrological evidence. Views and methodologies of leading modern scholars. Focus on methodology. Marriage, family, personal status, the economy, and judicial system. Basic familiarity with Roman history or law is expected. Serves as repeat credit for HIST 2238. [3] (SBS)

CLAS 3190. Augustan Rome. Social, administrative, religious, and military reforms. Common themes in art, architecture, and literature; changes in national identity in the transition from Republic to Empire. Serves as repeat credit for students who have earned credit for 3190W. Prerequisite: 1150, 2150, or 2160. [3] (HCA)

CLAS 3190W. Augustan Rome. [Formerly CLAS 296W] Social, administrative, religious, and military reforms. Common themes in art, architecture, and literature; changes in national identity in the transition from Republic to Empire. Prerequisite: 1150, 2150, or 2160. [3] (HCA)

CLAS 3200. The Greek City. [Formerly CLAS 211] The example of ancient Athens. The stoa, the theatre, the house, and fortifications. Institutions such as the courts, the public assembly, and the family. Literary, historical, archaeological, and philosophical sources. [3] (SBS)

CLAS 3210. Religions of the Ancient Mediterranean. [Formerly CLAS 245] Ancient religious practices and beliefs through the evidence of archaeological sites, material remains, and written texts. Cross-cultural comparisons of sanctuaries, rituals, priesthoods, and sacred texts and objects. Consideration of mystery cults, magic, and alternative groups. [3] (INT)

CLAS 3220. The Trojan War in History, Art, and Literature. [Formerly CLAS 240] Representations in Classical Greek art, literature, and archaeological evidence. The composition of the Homeric epics; the meaning of the Trojan War to later audiences. [3] (HCA)

CLAS 3230. Alexander the Great. [Formerly CLAS 243] Alexander's rise to power and conquests in Europe, Asia, and Africa; the legacy of his introduction of Greek culture to the East; his significance to later audiences. Offered on a graded basis only. [3] (HCA)

CLAS 3240. Greek Culture in the Roman World. Literature, culture, and politics from the 1st to 4th centuries AD. Developments in rhetoric, elite and popular entertainment, scholarship, and medicine. Relationship of literature to imperial rule. Administration through the prisms of cultural identity, cosmopolitanism, citizenship, religion, and the development of ruling classes. [3] (INT)

CLAS 3300. Akkadian. [Formerly CLAS 231] Introduction to the cuneiform script and to the grammar of Akkadian, the language of ancient Mesopotamia. Selected readings in Old Babylonian (CODEX Hammurabi, Mari letters) and Neo-Assyrian texts (Creation Poem, Gilgamesh Epic). [3] (INT)

CLAS 3301. Akkadian. [Formerly CLAS 232] Continuation of 3300. Introduction to the cuneiform script and to the grammar of Akkadian, the language of ancient Mesopotamia. Selected readings in Old Babylonian

(CODEX Hammurabi, Mari letters) and Neo-Assyrian texts (Creation Poem, Gilgamesh Epic). [3] (INT)

CLAS 3310. Culture of the Ancient Near East. [Formerly CLAS 236] A survey of highly sophisticated Near East cultures of the last three millennia before the common era (B.C.). Discussion of political histories, and the social, religious, and intellectual heritage of Mesopotamia, Egypt, and Anatolia through excavated artifacts and written documents. [3] (INT)

CLAS 3320. The Amarna Age. [Formerly CLAS 238] The Amarna period from the sixteenth through the twelfth centuries B.C.E., as illumined by excavations of palaces and temples in Egypt, Anatolia, Canaan, and Mesopotamia as well as the vast historical, legal, and literary documents of the period. Focus on the internationalism and theological speculation of the period as seen through the powerful personalities and accomplishments of leaders such as Thutmose III, Suppiluliumas, Ramses II, and the spiritually influential Akehnaten. [3] (INT)

CLAS 3350. History of Early and Medieval Christianity. Expansion from second through fifteenth centuries across the Mediterranean into Asia, Africa, and Europe. Believers' practice and doctrine, relationship with Roman Empire, development of the Church, and social and cultural history of believers from after New Testament into late Middle Ages. Global perspective. Roots of Catholicism, Protestantism, and Eastern Christianity. [3] (INT)

CLAS 3360. Early Christian Poetry. Composition and reception of verse from Late Antiquity to the Early Middle Ages. Historical, cultural, and geographic contexts of religious poetry and hymnody from the New Testament through the 9th century. Greek and Roman models, Christian literary innovations, and influence on modern writers. Readings in translation from Syriac, Greek, Latin, and Old English. [3] (INT)

CLAS 3370. History of Syriac Christianity. Christians who spoke the Aramaic dialect during Late Antiquity to modern times from the Near East to the Persian Gulf, India, and China. Culture and literature under the Byzantine Empire and the Islamic States in the Middle East. History and theology of religious communities. Historiographical debates about Syriac origins and development. [3] (INT)

CLAS 3380. Desert Spirituality in Early Christianity. Rise of asceticism in Late Antiquity. History and geography of asceticism in Syria and Egypt. Diversification and spread across the Mediterranean region. Selected readings in translation of sayings, hagiography, theology, and verse. Legacy in modern belief. [3] (INT)

CLAS 3600. Seminar in the Digital Humanities. Theory, method, and applications in history, classics, and religious studies. Focus on historical data and research tools in the study of the Mediterranean world. Integration and manipulation of textual and spatial data. Scholarly interfacing and public access. New media. Developing research plans. [3] (SBS)

CLAS 3700. Uncovering Greek Religion: Cults, Festivals, and Sanctuaries in the Ancient World. [Formerly CLAS 241] Paganism to Judaism and early Christianity. Material culture, including architecture, sculpture, votive dedications, and topography of sanctuaries. Relationship between religion and culture. Politics, warfare, and athletics. Impact of ancient cults on modern Greece. Taught in Greece. Offered on a graded basis only. No credit for students who have earned credit for 3210. [3] (INT)

CLAS 3710. Archaeology, History, and Culture in Greece: Kenchreai Field School. [Formerly CLAS 242] Archaeological field school at the site of Kenchreai with seminars and excursions in southern Greece. Basic techniques in excavation, survey, and the analysis of architecture, artifacts, and bones. Explorations of churches, temples, houses, and tombs. Focus on Greece during the Roman Empire and late antiquity. Landscape settlement, cult practice, cultural and social diversity, and funerary ritual. Offered on a graded basis only. [3] (INT)

CLAS 3720. History and Art of Ancient Rome. [Formerly CLAS 244] The mid-second century BCE to the mid-second century CE. Investigating significant sites, monuments, and museum collections in Rome and locations throughout southern Italy. Monumental and domestic architecture, wall paintings, sculpture, coins, and ancient sources. [3] (INT)

CLAS 3730. The Roman to Medieval Near East: Caesarea Excavations, Israel. From Herod the Great to the Mamluk conquest. Excavation of

the site of Caesarea on the Mediterranean coast. Social, cultural, economic, and religious history. Maritime commerce; Roman rule; and the Christian, Jewish, and Muslim communities. Archaeological methods, geospatial analysis, and processing artifacts. Monumental architecture, urban topography, and littoral environment. Daily field and laboratory work with additional seminars and excursions. [3] (INT)

CLAS 3850. Independent Study. [Formerly CLAS 289] Completion of a substantial research paper in either classics or the classical tradition under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits for all semesters of CLAS 3850] (No AXLE credit)

CLAS 3880. Internship Training. Under faculty supervision, students can gain experience in a range of Classics-related programs at public or private institutions including museums and/or federal agencies. Skills can be developed in the areas of public speaking and engagement, digital humanities and cultural heritage management. Credit hours earned are based upon actual work performed at the internship site. A minimum of 3 credit hours in background readings and research must be completed in CLAS 3881 concurrently with, and regardless of, the number of hours earned in 3880. A substantial research paper or report must be submitted at the end of the semester during which the internship is completed. These credit hours may NOT count in the minimum required for the CLAS major or minor. Normally, a 3.0 grade point average, 6 hours of prior work and prior approval of a specific plan of work by the director of undergraduate studies in Classical and Mediterranean Studies are required. Offered on a Pass/Fail basis only and must be taken concurrently with CLAS 3881. Corequisite: 3881. Variable credit. [1-9] (No AXLE credit)

CLAS 3881. Internship Readings and Research. Under faculty supervision, students can gain experience in a range of Classics-related programs, at public or private institutions, including museums and/or federal agencies. Skills can be developed in the areas of public speaking and engagement, digital humanities and cultural heritage management. Credit hours earned are based upon readings or research supervised by CLAS faculty to lend some intellectual foundation to the internship experience. A minimum of 3 credit hours in background readings and research must be completed in 3881 concurrently with, and regardless of, the number of hours earned in 3880. A substantial research paper or report must be submitted at the end of the semester during which the internship training is completed. These credit hours may count in the minimum required for the CLAS major or minor. Normally, a 3.0 grade point average, 6 hours of prior work and prior approval of a specific plan of work by the director of undergraduate studies in Classical and Mediterranean Studies are required. Offered on a graded basis only and must be taken concurrently with CLAS 3880. Corequisite: CLAS 3880. Variable credit: 3-6 (No AXLE credit)

CLAS 4998. Senior Honors Thesis. [Formerly CLAS 299A] Open only to seniors in the departmental honors program. [3] (No AXLE credit)

CLAS 4999. Senior Honors Thesis. [Formerly CLAS 299B] Open only to seniors in the departmental honors program. [3] (No AXLE credit)

Communication of Science and Technology

CSET 1001. Commons iSeminar. Topics vary. General Elective credit only. [1] (No AXLE credit)

CSET 2100. Science Communication Tools and Techniques. [Formerly CSET 201] Translating technical research for a general readership. Benefits and limitations of different formats, texts, and media for telling stories about science. [3] (HCA)

CSET 2410. The London Art-Science Scene: Visual Science Communication for the 21st Century. Maymester. Study and analysis of visual styles for scientific communication in world-leading London museums. Linking the exhibition experience to online media. Student development of visual scientific communication. [3] (INT)

CSET 2420. Art and Science: A Shared Past. Art and science as ways of knowing the world. Renaissance to the present with focus on histories of

observation and experiment. Alchemy, anatomy, museums, photography, and taxidermy. Organization of knowledge, labor, and creativity. [3] (P)

CSET 2430. The Craft of Computation. Origins of computers in craft technologies. Weaving, engineering, and programming from 1800 to 1980. Issues of labor, gender, and expertise. Exploration of relationship between making and knowing through hands-on investigation. Readings combined with experimental weaving lab using programmable looms. [3] (P)

CSET 3100. Science Policy Bootcamp, from Concept to Conclusion. Interdisciplinary service learning. Trends that shape science and innovation policy. Active policy-making. Prerequisite: Major or minor in Communication of Science and Technology or Public Policy Studies. Open to other students with permission of instructor. [3] (SBS)

CSET 3200W. Technical Writing. Introduction to technical and professional composition for careers in science, business, and industry. Prerequisite: major or minor in Communication of Science and Technology. Open to other students with permission of instructor. [3] (HCA)

CSET 3840. Directed Study. [Formerly CSET 289] Individual research and scholarly investigation in science, engineering, or medicine. Usually conducted in a laboratory setting. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

CSET 3841. Project in Science Writing and Communicating. [Formerly CSET 290] Presentation of scientific, engineering, or medical research, including biographical and historical background where appropriate, in one or more presentation styles (written, visual, web), under faculty supervision. May be repeated for credit more than once, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 3840 and approval of the program director. [1-3] (No AXLE credit)

CSET 3880. Internship Training. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs in projects related to the effective communication of scientific or technical knowledge or information. Corequisite: 3881. [1-9] (No AXLE credit)

CSET 3881. Internship Readings and Research. Under faculty supervision, students from any discipline can gain experience with agencies, institutions, and programs in projects related to the effective communication of scientific or technical knowledge or information. [1-6] (No AXLE credit)

CSET 3890. Special Topics. [Formerly CSET 150] Topics as announced. May be repeated for credit more than once if there is no duplication in topic, but students may earn only 3 credits per semester of enrollment. [3] (No AXLE credit)

CSET 4998. Honors Thesis. [Formerly CSET 296] Limited to students admitted to the Communication of Science and Technology Honors program. May be repeated for credit once, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 3840 and 3841. [1-3] (No AXLE credit)

Communication Studies

CMST 1001. Commons iSeminar. [Formerly CMST 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

CMST 1002. Introduction to Communication Studies. Theoretical foundations and practice of human communication. Argument and advocacy; public address; and critical analysis of media and culture. [3] (HCA)

CMST 1111. First-Year Writing Seminar. [Formerly CMST 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

CMST 1500. Fundamentals of Public Speaking. [Formerly CMST 100] Theory and practice in speaking before an audience. Problems of preparation, content, organization, language, and delivery are treated. [3] (HCA)

CMST 1501. Public Communication of Science. Theory and practice of speaking before an audience. Designed around the communication of science to non-specialists. Issues of adaptation, organization, evidence, delivery, and style. [3] (HCA)

CMST 1850. Interpersonal Communication. [Formerly CMST 101] A study of both the theory and application of verbal and nonverbal communication as they occur in relatively unstructured person-to-person and small group settings. [3] (SBS)

CMST 2075. Non-Equivalent Credit (CMST Category 1: Foundations). This course has no Vanderbilt equivalent. Credit is eligible to count toward the CMST major in the Foundations category.

CMST 2100. Argumentation and Debate. [Formerly CMST 200] A course in the practice of debate examining argumentation theory. Emphasis on forms of reasoning and use of evidence in debate. Prerequisite: 1500. [3] (HCA)

CMST 2110. Persuasion. [Formerly CMST 201] The theory and practice of persuasion with particular emphasis on speech composition, the use of language and its relationship to oral style, structure, and the relationship of structure to the process of speech preparation. Prerequisite: 1500. [3] (HCA)

CMST 2120. Business Communication. Theory and practice of communication in relation to businesses and organizations with application to leadership, values and ethics, strategic communication theory, and organizational conflict. Prerequisite: 1500. [3] (HCA)

CMST 2400. History of World Cinema. Survey of world film history from 1895 to the present. Key films and filmmakers. Historical, aesthetic, national, and political contexts of films and film movements. Prerequisite: CMA 1600. [3] (HCA)

CMST 2800. Rhetoric and Civic Life. [Formerly CMST 210] Public discourse and the duties and prerogatives of citizenship. Theory, models, and criticism of rhetoric and oratory in their deliberative, forensic, and epideictic settings. [3] (HCA)

CMST 2900. Values in Modern Communication. [Formerly CMST 223] An examination of values, explicit and implicit, in communication situations in modern American society. The course begins with the discovery and analysis of values and applies this process to technological innovation and rhetorical choice, interpersonal communication, advertising and consumerism, and mass-media persuasion. [3] (P)

CMST 2950. Rhetoric of Mass Media. [Formerly CMST 241] A study of the nature, effects, reasons for the effects, ethics, regulation, and criticism of contemporary mass media communication. Political causes, news reporting, commercial advertising, and similar sources of rhetoric are included. [3] (HCA)

CMST 3000. Rhetoric of the American Experience, 1640-1865. [Formerly CMST 220] A critical and historical examination of the methods and effects of public debate and other attempts to influence the attitudes, affective response, and behavior of the American people. Attention to the rhetorical features of selected issues and speakers from colonial times through the Civil War. [3] (US)

CMST 3001. Rhetoric of the American Experience, 1865 to 1945. [Formerly CMST 221] Critical and historical examination of the methods and effects of public debate and other attempts to influence the attitudes, affective response, and behavior of the American people. Attention to the rhetorical features of selected issues and speakers from 1865 to 1945. [3] (US)

CMST 3002. Rhetoric of the American Experience, 1945-Present. [Formerly CMST 225] Critical and historical examination of the methods and effects of public debate and other attempts to influence the attitudes, affective response, and behavior of the American people. Attention to the rhetorical features of selected issues and speakers from 1945 to the present. [3] (US)

CMST 3100. Rhetoric of Social Movements. [Formerly CMST 224] The role of communication in the creation, development, and function of social movements. The analysis of specific rhetorical acts. The study of the arguments, patterns of persuasion, and communication strategies of selected social movements. [3] (US)

CMST 3110. Women, Rhetoric, and Social Change. [Formerly CMST 226] Historical influences on women's social activism and engagement with public culture; rhetorical issues facing women advocates. Rhetorical strategies used by them in the U.S. and around the globe. [3] (US)

CMST 3120. Rhetoric of U.S. Religion. [Formerly CMST 229] American religious discourse in historical and contemporary contexts. Religious traditions and influential rhetorical texts. Significant religious controversies. [3] (US)

CMST 3140. Communication and the First Amendment. Principles, interpretations, and controversies related to the First Amendment of the United States' Constitution. Emphasis on freedom of religion, freedom of speech, and freedom of the press. [3] (US)

CMST 3150. Law, Media, and Society. Historical and contemporary studies of legal controversies and their mediation through print, television, film, and emergent media. Practices and politics of advocates involved in legislation and legal reform. Serves as repeat credit for CMST 3890, Section 01 in Fall 2016. [3] (HCA)

CMST 3200. Social Media and Everyday Life. Social media as assemblage of forms and communicative practices that create sociality in everyday life. Global and ethnographic perspectives. Not open to students who earned credit for 3890 section 1 in spring 2019. [3] (P)

CMST 3600. The Rhetorical Tradition. [Formerly CMST 222] Development of rhetorical concepts from classical Greece to the present. Significant rhetoricians and texts. The impact of context on rhetoric. [3] (HCA)

CMST 3620. Rhetoric, Culture, and Critique. [Formerly CMST 254] Rhetorical criticism of cultural texts and artifacts, including oratory, mass media, and other forms of public discourse. Fundamentals of effective rhetorical analysis and writing. Repeat credit for students who have completed 3620W. [3] (HCA)

CMST 3620W. Rhetoric, Culture, and Critique. [Formerly CMST 254W] Rhetorical criticism of cultural texts and artifacts, including oratory and mass media. Fundamentals of rhetorical analysis and writing. Repeat credit for students who have completed 3620. [3] (HCA)

CMST 3700. Politics and Mass Media. [Formerly CMST 244] Impact of mass-mediated communication on U.S. electoral politics. Pragmatic and ethical influences on the dissemination of information to voters during campaigns. [3] (HCA)

CMST 3710. Cultural Rhetorics of Film. [Formerly CMST 243] Film as rhetorical response to historical and cultural change. Filmic treatment of historical trauma; related genres, such as horror and melodrama. [3] (HCA)

CMST 3720. Communicating Gender. [Formerly CMST 235] Dominant modes of communicating gender ideology. Effects on policy, politics, and popular culture. Includes theories of rhetoric, gender, sexuality, race, and social class. [3] (P)

CMST 3730. Communication, Culture, and Consciousness. [Formerly CMST 242] The relationship between the primary means of communication in a culture and its influence on knowledge and subjectivity. Orality, literacy, and print, electronic, and digital communication. [3] (P)

CMST 3730W. Communication, Culture, and Consciousness. Relationship between the primary means of communication in a culture and its influence on knowledge and subjectivity. Orality and literacy. Print, electronic, and digital communication. Repeat credit for students who have earned credit for 3730. [3] (P)

CMST 3740. Rhetoric of Medicine and Health. Cultural construction of medicine and health through narratives, metaphors, and bodily practices. Case studies in art, ethics, activism, and public controversy. Serves as repeat credit for CMST 3890, Section 01 in Spring 2016. [3] (P)

CMST 3750. Rhetoric of the Body. Cultural construction of the body from a rhetorical perspective. Case studies include the history of disability, theories of pollution and pain, and bodily ethics. Serves as repeat credit for CMST 3890, Section 01 in Fall 2017. [3] (P)

CMST 3800. Communication and Media Studio. Theory and practice of media making. Core concepts in communication studies. Student-designed projects aimed at influencing public discourse. Prerequisite: 1500. [3] (HCA)

CMST 3840. Directed Readings. [Formerly CMST 290] Supervised reading and writing in a selected field of the discipline under the guidance of a faculty supervisor. Consent of both the faculty supervisor and the director of undergraduate studies required. Normally open only to majors in communication studies. May be repeated for a total of 6 credits in 3850 and 3840 combined, but students may earn only up to 3 credits per semester of enrollment. [3; maximum of 6 credits total for all semesters of CMST 3850 and 3840] (No AXLE credit)

CMST 3850. Independent Study. [Formerly CMST 289] A research project in rhetorical criticism to be arranged with the individual instructor. Designed for students who have taken either 3000 or 3001. May be repeated for a total of 6 credits in 3850 and 3840 combined, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of CMST 3850 and 3840] (No AXLE credit)

CMST 3890. Selected Topics in Communication Studies. [Formerly CMST 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

CMST 4940. Seminars in Selected Topics. [Formerly CMST 295] Topics of special interest. May be repeated for a total of 6 credits in 4940 and 4941 combined if there is no duplication in topic. Students may enroll in more than one section of this course per semester of enrollment. Prerequisite: 15 hours of Communication Studies. [3; maximum of 6 credits total for all semesters of CMST 4940 and 4941] (No AXLE credit)

CMST 4941. Seminars in Selected Topics. [Formerly CMST 296] Topics of special interest. May be repeated for a total of 6 credits in 4940 and 4941 combined if there is no duplication in topic. Students may enroll in more than one section of this course per semester of enrollment. Prerequisite: 15 hours of Communication Studies. [3; maximum of 6 credits total for all semesters of CMST 4940 and 4941] (No AXLE credit)

Creole

CREO 1101. Elementary Creole I (Duke). Haitian Creole or Kreyòl language. Vocabulary and idioms. Haitian culture. Understanding, speaking, reading, and writing in contexts of health care, Haitian women's rights, and unpaid child servants (restavèk). Offered on a graded basis only. [3] (No AXLE credit)

CREO 1102. Elementary Creole II (Duke). Essential elements of Creole language and aspects of Haitian culture. Speaking, listening, reading, and writing. Exposure to Haitian culture through films, storytelling, games, music, and proverbs. Prerequisite: 1101 or a comparable level of previous Creole language experience, such as familial background in Creole. Offered on a graded basis only. [3] (INT)

CREO 2201. Intermediate Creole I (Duke). Understanding, speaking, reading, and writing in cultural context; issues of rural life in Haiti, religion, Frenchified Creole vs popular Creole. Texts, poems, novel excerpts. Focus on contemporary events and debates in Haitian culture. Offered on a graded basis only. Prerequisite: 1102. [3] (INT)

CREO 2202. Intermediate Creole II (Duke). Second semester of Intermediate Creole. Offered on a graded basis only. Prerequisite: 2201 or equivalent. [3] (INT)

Earth and Environmental Sciences

EES 1001. Commons iSeminar. [Formerly EES 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

EES 1030. Oceanography. [Formerly EES 103] An introduction to the geology, biology, chemistry, and physics of the marine environment. [3] (MNS)

EES 1030L. Oceanography Laboratory. [Formerly EES 113] Laboratory to accompany 1030. Corequisite: 1030. One three-hour laboratory

per week. Satisfies the AXLE lab course requirement when completed with 1030. [1] (No AXLE credit)

EES 1070. Volcanoes: Impacts on Earth and Society. [Formerly EES 107] How magmas form and volcanoes erupt; eruption processes and their hazards to society. Volcanic influence on human history and the evolution of the Earth. Not open to students who have earned credit for EES 1111-03 without permission. Total credit for this course and EES 1111-03 will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (MNS)

EES 1080. Earth and Atmosphere. [Formerly EES 108] The science of the atmosphere: principles of weather and climate; the atmosphere as part of the Earth system; weather forecasting; hurricanes, tornadoes, and severe storms; human impacts, such as air pollution and climate change. [3] (P)

EES 1111. First-Year Writing Seminar. [Formerly EES 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

EES 1140. Ecology, Evolution, and Climates through Time. [Formerly EES 114] Biological responses to global climate and environmental change through geologic time. Causes of climate change and its impact on biodiversity, including extinction implications. Interactions between climate, environments, and the evolution of organisms, emphasizing vertebrates during the past 65 million years. [3] (MNS)

EES 1400. Iceland's Geology. [Formerly EES 140] Processes that shape Icelandic landscapes. Volcanoes, glaciers, rivers, ocean, climate. History of interaction between the environment and Icelanders. Introduction at Vanderbilt, two weeks Icelandic field experience; laboratory includes both classroom and field work. Prerequisite: 1510, 1070, or 1111. [4] (MNS)

EES 1510. The Dynamic Earth: Introduction to Geological Sciences. [Formerly EES 101] Processes that have changed the earth. Relation between these processes and their products (e.g., earthquakes, minerals and rocks, mountains, oceanic features); interactions between processes affecting the solid, liquid, and gaseous components of earth; impact on humans. [3] (MNS)

EES 1510L. Dynamic Earth Laboratory. [Formerly EES 111] Laboratory to accompany 1510. Corequisite: 1510. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1510. [1] (No AXLE credit)

EES 2110. Global Climate Change. [Formerly EES 201] Science and policy of global climate change: history and causes of climate change in Earth's past, with emphasis on the last 2 million years; evidence of human impacts on climate since 1850; future climate change and its economic, social, and ecological consequences; economic, technological, and public policy responses. Not open to students who have earned credit for EES 3310 without permission. Serves as repeat credit for 3310. Prerequisite: 1510 or 1080. [3] (MNS)

EES 2114. Above and Below the Surface: The Caribbean between Climate Change and Tourism. Caribbean islands, history, tourism, and ecology. Human-environment interactions. Under water and above water ecologies; Scuba diving and environmental research. Development of interdisciplinary critical thought. Applied research. [3] (INT)

EES 2150. Science, Risk, and Policy. [Formerly EES 205] Assessment and management of deadly risks: comparison of markets, regulatory agencies, and courts for managing risks; cultural and scientific construction of risk; psychology of risk perception; case studies such as Hurricane Katrina, mad cow disease, and air pollution. [3] (P)

EES 2510. Earth Systems through Time. [Formerly EES 202] Effects of feedbacks between the geologic cycles on the lithosphere, hydrosphere, biosphere, and atmosphere at diverse intervals in the Earth's history. Present and future implications. Interpretations of evidence recorded in Earth materials. Three hours of lecture and one laboratory per week. Repeat credit for students who have completed 1020. Prerequisite: 1510 and 1510L, or 1030 and 1030L. [4] (MNS)

EES 2550. Earth Materials. [Formerly EES 225, EES 3250] Solid materials that make up the earth: rock, soil, and sediment, with emphasis on the minerals that are their major constituents. Hand specimen, optical, and X-ray methods of description and identification. Physical and chemical processes that form and modify earth materials and the use of these materials in interpreting earth processes of the past and present. Field trips. Three lectures and one laboratory per week. Prerequisite: 1030 and 1030L, or 1510 and 1510L. [4] (MNS)

EES 2580. Earth System Dynamics. Transport and motion in Earth's systems. Conservation of mass, energy, and momentum over space and time. Earth's processes that lead to and regulate the transport of these quantities. Quantifying Earth's dynamical behavior and describing it with models. Prerequisite: 1030/1030L, 1080, or 1510/1510L. [3] (MNS)

EES 3220. Life Through Time. [Formerly EES 220] Ecology, classification, and evolution of important groups of fossils, emphasizing invertebrates. Change in marine ecosystems through geologic time. Causes and effects of rapid evolution events and mass extinctions. Three hours of lecture and one laboratory period per week. Prerequisite 2510, 2550, 2580, BSCI 1100, or BSCI 1511. [4] (MNS)

EES 3260. Petrology. [Formerly EES 226] Nature, distribution, and theories of origin of igneous, metamorphic, and sedimentary rocks. Mineralogy as a function of rock-forming conditions. Laboratory emphasis on description and interpretation of rocks, using hand sample and microscope techniques. Field trips. Three lectures and one laboratory period per week. Prerequisite: 2550. [4] (MNS)

EES 3280. Environmental Geochemistry. Chemistry of Earth's surface including the interaction of solids, liquids, and gases. Earth's biogeochemical cycles. Natural and anthropogenic transformations in the Critical Zone. Collection and analysis of environmental samples in the field. Prerequisite 2150, 2550, or 2580. [4] (MNS)

EES 3310. Global Climate Change. Scientific principles and policy applications. Earth's past; evidence of human impact; future climate change; and economic, social, and ecological consequences. Economic, technological, and public policy responses. Serves as repeat credit for EES 2110. Prerequisite: one of 1030, 1080, 1510, BSCI 1510, CHEM 1601, ECON 1010, ES 1401 or PHYS 1501, 1601, 1901. [4] (MNS)

EES 3330. Sedimentology. [Formerly EES 230] The origin and composition of sedimentary particles, their transportation to the site of deposition, actual deposition, and the processes involved in lithifying sediments into solid rock. Emphasis on interpretation of ancient source areas and depositional environments. Terrigenous, carbonate, and other rock types will be studied. Field trips. Three lectures and one laboratory period. Prerequisite 2510, 2550, or 2580. [4] (MNS)

EES 3340. Structural Geology and Rock Mechanics. [Formerly EES 240] Principles of rock deformation from microscopic to mountain range scales. Stress and strain; mechanisms of deformation; geometries of faulting and folding. Interpreting geologic maps and constructing cross sections. Applications to tectonics, natural resources, and earthquakes. Prerequisite: 2510, 2550, or 2580. [4] (MNS)

EES 3480. Mass Extinctions. Synthesizing causes, consequences, and dynamics of past mass extinction events. Using fossil records to interpret current and future trends in biodiversity loss. No credit for students who have earned credit for 3891-02 offered spring 2017 or spring 2018. [3] (MNS)

EES 3841. Directed Study. [Formerly EES 289A] Readings in related fields and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students or by consent of the department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 2 credits per semester of enrollment. [1-2] (No AXLE credit)

EES 3842. Directed Study. [Formerly EES 289B] Readings in related fields and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students or by consent of the department chair. Does not count toward minimum requirements for the major. May be repeated for

credit more than once if there is no duplication in topic, but students may earn only up to 2 credits per semester of enrollment. [1-2] (No AXLE credit)

EES 3851. Independent Study. [Formerly EES 291A] Readings with related field and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students. Other students must have consent of department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

EES 3852. Independent Study. [Formerly EES 291B] Readings with related field and/or laboratory research in pursuit of a scholarly project conceived and executed under the supervision of a faculty member. Open to senior majors and graduate students. Other students must have consent of department chair. Does not count toward minimum requirements for the major. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

EES 3865. Field Investigations. [Formerly EES 210] Content varies according to location and disciplinary focus. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (MNS)

EES 3891. Special Topics. [Formerly EES 290] Topics vary. May be repeated for credit more than once by permission of the director of undergraduate studies. Students may enroll in more than one section of this course each semester. Prerequisite: 1030 or 1510. [3] (No AXLE credit)

EES 4233. Conservation Biology. Ecological, evolutionary, social, and economic aspects of biodiversity loss and ecosystem disruption due to human activities. Climate change, habitat fragmentation, species overexploitation, and invasive species. Sustainable development, habitat restoration, and species reintroduction. Prerequisite: 1511. [3] (MNS)

EES 4238. Ecology. Population biology, evolutionary ecology, community structure, with emphasis on species interactions, including competition, predation, and symbiosis. Prerequisite: BSCI 1511. [3] (MNS)

EES 4420. Geomorphology. [Formerly EES 261] Analysis of the Earth's landforms, their morphology, history, and the processes that form them. The building of relief and its subsequent transformation by geologic processes on hillslopes, rivers, coasts, wetlands, and glaciers. The natural history and human impacts on land forms. Field trips. Familiarity with basic physics (mechanics) is expected. Prerequisite: 1030 or 1510. [3] (MNS)

EES 4550. Transport Processes in Earth and Environmental Systems. [Formerly EES 255] Principles of conservation and constitutive transport laws; classic and emerging styles of modeling natural systems. Prior study of basic calculus (functions, derivatives, integrals) and physics (mechanics) is expected. Prerequisite: senior or graduate standing with a major in Earth and Environmental Sciences, Biological Sciences, Chemistry, Mathematics, Physics, or the School of Engineering. [3] (MNS)

EES 4600. Geochemistry. [Formerly EES 260] Application of chemistry to study the distribution and cycling of elements in the crust of the earth. Includes chemical bonding and crystallization, phase rules and phase diagrams, chemical equilibria, theories on the origin of elements, earth, ocean, atmosphere, and crust. Prerequisite: 2550 and CHEM 1602. [3] (MNS)

EES 4650. Physics of the Climate System. Physical processes affecting the climate system. Global energy balance of Earth and planets. Surface temperature and how it is regulated. Electromagnetic radiation and its interaction with atmospheric gases, clouds, and aerosols. Ocean heat storage, cloud and precipitation processes, and the impact of sea and inland ice on temperature. Processes that govern the water and carbon cycle. [3] (MNS)

EES 4680. Paleoclimates. [Formerly EES 268] Fluctuations in Earth's climate with an emphasis on the past 700 million years. Forcings and feedback that influence climate and drive change. Techniques used to reconstruct past climate change using marine and terrestrial geologic deposits and geochronologic methods. Prerequisite: 1510 and 2510. [3] (MNS)

EES 4750. Sustainability: An Environmental Science Perspective. [Formerly EES 275] Principles, problems, and solutions of environmental

sustainability, with a focus on the links among the environment, society, and economy. Prerequisite: junior standing. [3] (MNS)

EES 4760. Agent- and Individual-Based Computational Modeling.

Applications in natural, social, and behavioral sciences and engineering. Designing, programming, and documenting models. Using models for experiments. Examples from environmental science, ecology, economics, urban planning, and medicine. Familiarity with basic statistics and proficiency in algebra are expected. [3] (MNS)

EES 4820. Paleoecological Methods. [Formerly EES 282] Tools used to interpret past environments and climates, including plant microfossils, pollen and phytoliths, vertebrate morphology, and dental microwear and mesowear. Geochemical tools such as stable isotopes and rare earth elements. Integrating methods for paleontological and anthropological studies, including the use of databases and meta-analyses. Readings from primary sources. Prerequisite: 1030 or 1510. [3] (MNS)

EES 4830. Volcanic Processes. [Formerly EES 285] Nature, behavior, and origin of volcanoes. Magmatic processes that lead to eruptions. Eruptive processes and volcano construction. Impacts of volcanism on Earth's surface environment. Prerequisite: 3260. [3] (MNS)

EES 4961. Senior Seminar. [Formerly EES 299] Integrating concepts and information from diverse fields. Offered on a graded basis only. Limited to seniors in the final semester of the major. [1] (No AXLE credit)

EES 4996. Senior Honors Seminar I. Research methods and scientific writing and communication, including work towards senior honors project, thesis, and oral presentation. Open only to senior departmental honors candidates. Does not count toward minimum requirements for major. Corequisite: 4998 [1] (No Axle Credit)

EES 4997. Senior Honors Seminar II. Research methods and scientific writing and communication, including work towards senior honors project, thesis, and oral presentation. Open only to senior departmental honors candidates. Does not count toward minimum requirements for major. Prerequisite: 4996, Corequisite: 4999 [1] (No AXLE Credit)

EES 4998. Senior Honors Research. [Formerly EES 292A] Independent research under faculty supervision that culminates in an oral presentation and written thesis submitted to the faculty. Open only to departmental honors candidates. Does not count toward minimum requirements for the major. [2] (No AXLE credit)

EES 4999. Senior Honors Research. [Formerly EES 292B] Independent research under faculty supervision that culminates in an oral presentation and written thesis submitted to the faculty. Open only to departmental honors candidates. Does not count toward minimum requirements for the major. [2] (No AXLE credit)

Economics

ECON 1001. Commons iSeminar. [Formerly ECON 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ECON 1010. Principles of Macroeconomics. [Formerly ECON 100] The role of scarcity and prices in allocating resources. National income, fluctuations in unemployment and price level, monetary and fiscal policy. [3] (SBS)

ECON 1020. Principles of Microeconomics. [Formerly ECON 101] The behavior of households and business in markets. Competition, monopoly, and rivalry in product and factor markets. Equilibrium. Income distribution. International trade. Prerequisite: 1010. [3] (SBS)

ECON 1111. First-Year Writing Seminar. [Formerly ECON 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ECON 1500. Economic Statistics. [Formerly ECON 150] The use of quantitative data in understanding economic phenomena. Probability, sampling, inference, and regression analysis. Not open to students who have earned credit for 1510. Total credit for this course and 1510 will not

exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: Math 1100, 1200, or 1300. [3] (SBS)

ECON 1510. Intensive Economic Statistics. [Formerly ECON 155] Quantitative techniques in economic analysis. Probability sampling, inference, and multiple regression. Not open to students who have earned credit for 1500. Total credit for this course and 1500 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: MATH 1100, 1200 or 1300. [3] (SBS)

ECON 2100. Labor Economics. [Formerly ECON 212] Introduction to labor markets in the United States. Foundations and applications of labor supply and demand, immigration and immigration policies, investment in human capital, wage policies of employers, minimum wage legislation, labor market discrimination and remedial programs, effects of labor unions, and unemployment. Prerequisite: 1010 and 1020. [3] (SBS)

ECON 2150. Economic History of the United States. [Formerly ECON 226] Economic development of the United States from the Colonial period to the present. Interrelated changes in economic performance, technology, institutions, and governmental policy. Prerequisite: 1010 and 1020. [3] (US)

ECON 2160. Strategic Analysis. [Formerly ECON 235] Introduction to sequential and simultaneous games. Backward induction, equilibrium, pure and mixed strategies. Cooperation and conflict, the prisoner's dilemma, threats, promises, and credibility. Brinkmanship, uncertainty, the role of information, auction design, bidding strategies, and bargaining. Voting and agenda control. Prerequisite: 1010 and 1020. [3] (SBS)

ECON 2170. Environmental Economics. [Formerly ECON 228] Public policies to address market failures. Energy policy, climate change, biodiversity, globalization, and population growth. Sustainable economic activity, recycling, valuing environmental amenities, addressing ethical dilemmas, and resolving disputes. Offered on a graded basis only. Prerequisite: 1010 and 1020. [3] (SBS)

ECON 2180. Sports Economics. [Formerly ECON 242] Intercollegiate and professional sports leagues. Competitive balance, player labor markets, and owner capital markets. Theories of league expansion, rival leagues, franchise relocation, and sports venue finance. Comparisons of international sports leagues. Offered on a graded basis only. Prerequisite: 1010 and 1020. [3] (SBS)

ECON 2220. Latin American Development. [Formerly ECON 222] Economic growth and structural change. Historical legacies, import-substitution, debt crisis, inflation, and macroeconomic stabilization. Regional and national economic integration, migration, and conflict. Poverty, inequality, and policies. No credit for graduate students in economics. Prerequisite: 1010. [3] (SBS)

ECON 2260. International Economics. Causes, consequences, and conduct of economic interactions among sovereign nations. Trade in goods and services; international monetary and financial interactions; winners and losers; exchange rates and the balance of payments; economic organizations. Offered on a graded basis only. Prerequisite: 1010 and 1020. [3] (SBS).

ECON 2300. Money and Banking. [Formerly ECON 209] A study of commercial banks and other intermediaries between savers and investors in the United States, including the government's role as money creator, lender, and regulator of private credit, and the effects of financial institutions on aggregate economic activity. Prerequisite: 1010 and 1020. [3] (SBS)

ECON 2340. Plunder and Pillage: The Economics of Warfare and Conflict. [Formerly ECON 230] International and domestic economic conflict. Offensive and defensive strategies. Fortifications, strategic bombing, and conscription. Corporate takeovers, bargaining failures, and labor strikes. Prerequisites: 1010 and 1020. [3] (SBS)

ECON 2350. Health Care Policy. [Formerly ECON 221] Health care markets in the United States. Supply and demand, social insurance policies, pharmaceuticals, malpractice, and health care reform. Prerequisite: 1010 and 1020. [3] (SBS)

ECON 2890. Special Topics. [Formerly ECON 249] Topics of special interest. May be repeated for credit more than once if there is no duplication

in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 1010 and 1020. [3] (No AXLE credit)

ECON 3010. Intermediate Microeconomic Theory. [Formerly ECON 231] Development of the techniques of analysis for problems of resource allocation. Theories of choice and production for individual economic agents in competitive and monopolistic environments. Behavior of markets. Determination of prices, wages, interest, rent, and profit. Income distribution. Not open to students who have earned credit for 3012. Total credit for this course and 3012 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1010, 1020, and either MATH 1100, 1200, or 1300. [3] (SBS)

ECON 3012. Microeconomics. Consumer choice and firm behavior from the fundamentals of preference and production theory. Calculus-based optimization. Price-determination, analysis of market equilibrium, perfect competition and the effect of market power in monopolies and oligopolies. Efficiency, welfare, and market failures. Not open to students who have earned credit for 3010. Total credit for this course and 3010 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1010, 1020, and either MATH 1201 or 1301. [3] (SBS)

ECON 3020. Intermediate Macroeconomic Theory. [Formerly ECON 232] National income accounting and analysis. Classical, Keynesian, and contemporary models determining national income, employment, liquidity, price level, and economic growth. Not open to students who have earned credit for 3022. Total credit for this course and 3022 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1010, 1020, and either MATH 1100, 1200, or 1300. [3] (SBS)

ECON 3022. Macroeconomics. Contemporary models of national income, employment, interest rates, price level, and economic growth. Decisions underlying consumption and investment behavior, as well as the effect of government policies. Not open to students who have earned credit for 3020. Total credit for this course and 3020 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1010, 1020, and either MATH 1201 or 1301. [3] (SBS)

ECON 3032. Applied Econometrics. Quantitative economic analysis with emphasis on multivariate regression. Measurement, specification, estimation, inference, prediction, and interpretation of econometric models. Experience with data and computer applications. Not open to students who have earned credit for 3035 or 3050. Total credit for this course and 3035 will not exceed 3 credit hours. Total credit for this course and 3050 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1020; either 1500, 1510, or both MATH 2820L and either MATH 2810 or 2820; and either Math 1201 or 1301. [3] (SBS)

ECON 3035. Econometric Methods. Properties and problems in estimating economic relationships with multiple regression. Statistical and econometric theory to address empirical questions. Hands-on experience with economic data analysis with programming in statistical software. Not open to students who have earned credit for 3032 or 3050. Total credit for this course and 3032 will not exceed 3 credit hours. Total credit for this course and 3050 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1020, either 1500, 1510, or both MATH 2820L and either MATH 2810 or 2820; and either Math 1201 or 1301. [3] (SBS)

ECON 3050. Introduction to Econometrics. [Formerly ECON 253] Quantitative methods of economic analysis. Measurement, specification, estimation, and interpretation of economic models. Econometric computation using microcomputers. Not open to students who have earned credit for 3032 or 3035. Total credit for this course and 3032 will not exceed 3 credit hours. Total credit for this course and 3035 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Not offered after AY 2019-20. Prerequisite: 3010 or 3012 and either 1500 or 1510; or MATH 2820L with either MATH 2810 or MATH 2820. [3] (SBS)

ECON 3100. Wages, Employment, and Labor Markets. [Formerly ECON 251] Theories and empirical evidence of the determinants of wages and employment. Compensating differentials, education and human capital, migration and labor mobility, discrimination, incentive pay, wage inequality. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3110. Poverty and Discrimination. [Formerly ECON 267] Theories and empirical evidence concerning inequality, poverty, and discrimination, and their relationship to economic growth. Evaluation of anti-poverty and anti-discrimination policies. Prerequisite: 3010 or 3012; and one of 1500, 1510, 3032, 3035, 3050. [3] (SBS)

ECON 3150. Topics in the Economic History of the U.S. [Formerly ECON 266] Analysis of major issues and debates in American economic history. Prerequisite: 3010 or 3012. [3] (US)

ECON 3160. Economic History of Europe. [Formerly ECON 271] Sources of Western European economic progress. Organization of overseas merchant empires, origins of the Industrial Revolution, the role of property rights, demographic patterns, and changing living standards. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3200. Public Finance. [Formerly ECON 254] Theories of the state and collective decisions, fiscal federalism, public goods and externalities. Tax theory: equity, efficiency, and growth. Taxation of goods, factors, and corporations. Cost-benefit analysis. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3230. Urban Economics. [Formerly ECON 279] Urban growth, development of suburbs, location of firms, housing markets, transportation, property taxes, and local government services. Offered on a graded basis only. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3250. Industrial Organization. [Formerly ECON 274] Models of market structure and behavior from monopoly and oligopoly to perfect competition. Strategic interaction between a firm and its customers and between a firm and its competitors. Firm practices and government policies that promote or hinder the efficient operation of markets. Offered on a graded basis only. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3270. Economics of Information and Communications Technology. The Internet, cloud computing, social networks, e-commerce, and Internet telephony as influencers of commerce and consumer welfare. Streaming content, big data, informatics, and open source software in economic perspective. Property rights, competition, and regulation in cyberspace. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3300. Financial Instruments and Markets. [Formerly ECON 259] Theoretical and empirical approaches to the analysis of monetary and other financial instruments. Portfolio analysis, interest rate risk, and financial futures and options markets. Prerequisite: Either 3010 or 3012; and either 3020 or 3022. [3] (SBS)

ECON 3330. Economics of Risk. Decision making under risk and uncertainty. Expected utility, risk aversion, and the value of information. Investments, insurance, and lotteries. Moral hazard and adverse selection. Prospect theory. Serves as repeat credit for ECON 3893-01 in Fall 2016. Prerequisite: 3010 (or 3012) with either 1500 or 1510; or Math 2820L with either Math 2810 or Math 2820. [3] (SBS)

ECON 3350. Economics of Health. [Formerly ECON 268] Demand for health and health care. Value of health, life, and medical innovation. Health insurance. Supply and organization of health care services. U.S. health care reforms. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3600. International Trade. [Formerly ECON 263] International trade in goods and services. Patterns of trade; gains and losses from trade, tariffs, and other commercial policies; economic integration; and international factor movements. Offered on a graded basis only. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 3610. International Finance. [Formerly ECON 264] Economics of international monetary, financial, and macroeconomic relationships. Effects of monetary and fiscal politics in open economies, balance of payments, exchange rate determination, and international monetary institutions. Prerequisite: 3020 or 3022. [3] (SBS)

ECON 3650. Development Economics. [Formerly ECON 288] Determinants of national economic growth for pre-industrial and newly industrial countries. Inequality and poverty. Imperfect credit markets and microfinance. Political constraints and corruption. Policy issues relevant to developing economics. Prerequisite: 3010 or 3012, and either 1500, 1510, 3032, 3035, or 3050. [3] (INT)

ECON 3698. Junior Honors Research. Honors thesis proposal under the supervision of a thesis adviser and the Director of Honors. Open only to junior majors with the approval of the Director of Honors. Prerequisite: 3010 or 3012. [1] (No AXLE credit)

ECON 3700. Economic Growth. [Formerly ECON 281] Determinants of macroeconomic growth. Mathematical theories of exogenous and endogenous growth. Comparison of growth rates across countries and time. The effect of growth rates on economic well-being. The effect of tax rates. Prerequisite: 3010 or 3012, and 3020 or 3022. [3] (SBS)

ECON 3750. Econometrics for Big Data. Econometric methods for analyzing large datasets. Model selection, regularization, classification, resampling, tree-based methods, and support vector machines. Forecasting stock prices, prediction of housing prices, and determination of wages. Prerequisite: 3010 or 3012; either 3032, 3035, 3050; or MATH 2820L with MATH 2810 or 2820. [3] (SBS)

ECON 3851. Independent Study in Economics. [Formerly ECON 291A] A program of independent reading in economics, arranged in consultation with an adviser. Limited to students having written permission from an instructor and the director of undergraduate studies. Prerequisite: 3010 or 3012. [Variable credit: 1-3 each semester, or 1-6 for departmental honors candidates; maximum of 12 hours in 3851 and 3852 combined for departmental honors students; maximum of 6 hours in 3851 and 3852 combined for other students] (No AXLE credit)

ECON 3852. Independent Study in Economics. [Formerly ECON 291B] A program of independent reading in economics, arranged in consultation with an adviser. Limited to students having written permission from an instructor and the director of undergraduate studies. Prerequisite: 3010 or 3012. [Variable credit: 1-3 each semester, or 1-6 for departmental honors candidates; maximum of 12 hours in 3851 and 3852 combined for departmental honors students; maximum of 6 hours in 3851 and 3852 combined for other students] (No AXLE credit)

ECON 3893. Selected Microeconomic Topics. [Formerly ECON 293] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3010 or 3012. [3] (No AXLE credit)

ECON 3894. Selected Macroeconomic Topics. [Formerly ECON 294] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3020 or 3022. [3] (No AXLE credit)

ECON 4050. Topics in Econometrics. [Formerly ECON 284] Emphasis on applications. May include generalized method of moments, empirical likelihood, resampling methods, and nonparametric techniques. Prerequisite: 3032, 3035, or 3050. [3] (SBS)

ECON 4110. Macroeconomic Models for Policy Analysis. [Formerly ECON 265] Mathematical models of overlapping generations, rational expectations, and open economies with price rigidities applied to social security, government debt, exchange rates, monetary policy, and time inconsistent optimal policy. Prerequisite: 3020 or 3022. [3] (SBS)

ECON 4210. Law and Economics. [Formerly ECON 285] The influence of legal rules and institutions on the behavior of individuals and on economic efficiency and equity. Applications from civil procedure as well as property, contract, tort, and criminal law. Offered on a graded basis only. Prerequisite: 3010 or 3012 and either 1500, 1510, 3032, 3035, or 3050. [3] (SBS)

ECON 4220. Social Choice Theory. [Formerly ECON 255] Strategic and non-strategic social choice theory. Preference aggregation, formal models of voting, and matching. Prerequisite: 3010 or 3012 or PHIL 3003 or any Mathematics course numbered 2500 or above. [3] (SBS)

ECON 4260. Game Theory with Economic Applications. [Formerly ECON 273] Rational decision-making in non-cooperative, multi-person games. Single play and repeated games with complete and incomplete information. Economic applications of games, such as auctions, labor-management bargaining, pricing and output decisions in oligopoly, and common property resources. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 4510. Seminar in Macroeconomic Policy. [Formerly ECON 256] Intensive study of three or four current problems in economic policy. Studies in topics such as macroeconomic policy for the year ahead, financial market issues, international economic policy issues. Repeat credit for students who have completed 4510W. Limited to majors in economics and public policy. Prerequisite: 3010 or 3012; and 3020 or 3022. [3] (SBS)

ECON 4510W. Seminar in Macroeconomic Policy. [Formerly ECON 256W] Intensive study of three or four current problems in economic policy. Studies in topics such as macroeconomic policy for the year ahead, financial market issues, international economic policy issues. Repeat credit for students who have completed 4510. Limited to majors in economics and public policy. Prerequisite: 3010 or 3012; and 3020 or 3022. [3] (SBS)

ECON 4520W. Seminar on Globalization. [Formerly ECON 260W] Causes of global economic integration. Winners and losers. World Trade Organization, international environmental treaties, labor and capital markets. U.S. leadership. Offered on a graded basis only. Prerequisite: 3010 or 3012; and either 1500, 1510, 3032, 3035, or 3050. [3] (SBS)

ECON 4530. Seminar in Microeconomic Policy. [Formerly ECON 257] Intensive study of three or four current problems in microeconomic policy. Repeat credit for students who have completed 4530W. Limited to majors in economics and public policy. Prerequisite: 3010 or 3102. [3] (SBS)

ECON 4530W. Seminar in Microeconomic Policy. [Formerly ECON 257W] Intensive study of three or four current problems in microeconomic policy. Repeat credit for students who have completed 4530. Limited to majors in economics and public policy. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 4540W. Economics of Conflict. [Formerly ECON 277W] Economic relationships that appropriate value from other parties. War, crime, litigation, family quarrels, and rent-seeking. The visible hand, principal-agent problems, and negative sum games. Prerequisite: 3010 or 3012. [3] (SBS)

ECON 4550. Seminar in Sports Economics. [Formerly ECON 280] Issues and debates. Offered on a graded basis only. Prerequisite: 2180, and 3010 or 3012. [3] (SBS)

ECON 4981. Honors Seminar. [Formerly ECON 295A] Discussion of selected topics and senior thesis research. Open only to seniors in the departmental honors program. Prerequisite: 3010 or 3012. [1] (No AXLE credit)

ECON 4982. Honors Seminar. [Formerly ECON 295B] Discussion of selected topics and senior thesis research. Open only to seniors in the departmental honors program. Prerequisite: 3010 or 3012. [1] (No AXLE credit)

ECON 4998. Senior Thesis. [Formerly ECON 292A] Limited to and required of all candidates for departmental honors. Prerequisite: 3010 or 3012. [1-3] (No AXLE credit)

ECON 4999. Senior Thesis. [Formerly ECON 292B] Limited to and required of all candidates for departmental honors. Prerequisite: 3010 or 3012. [1-3] (No AXLE credit)

English

ENGL 1001. Commons iSeminar. [Formerly ENGL 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ENGL 1100. Composition. [Formerly ENGL 100] For students who need to improve their writing. Emphasis on writing skills, with some analysis of modern nonfiction writing. [3] (No AXLE credit)

ENGL 1111. First-Year Writing Seminar. [Formerly ENGL 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion,

oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ENGL 1210W. Prose Fiction: Forms and Techniques. [Formerly ENGL 104W] Close study of short stories and novels and written explication of these forms. [3] (HCA)

ENGL 1220W. Drama: Forms and Techniques. [Formerly ENGL 105W] Close study of representative plays of the major periods and of the main formal categories (tragedy, comedy) and written explication of these forms. [3] (HCA)

ENGL 1230W. Literature and Analytical Thinking. [Formerly ENGL 102W] Close reading and writing in a variety of genres drawn from several periods. Productive dialogue, persuasive argument, and effective prose style. Offered on a graded basis only. [3] (HCA)

ENGL 1240. Beginning Nonfiction Workshop. Writing various forms of prose nonfiction. [3] (HCA)

ENGL 1250W. Introduction to Poetry. [Formerly ENGL 116W] Close study and criticism of poems. The nature of poetry, and the process of literary explication. [3] (HCA)

ENGL 1260W. Introduction to Literary and Cultural Analysis. [Formerly ENGL 118W] Analysis of a range of texts in social, political, and aesthetic contexts. Interdisciplinary study of cultural forms as diverse as poetry, advertisement, and film. [3] (HCA)

ENGL 1270W. Introduction to Literary Criticism. [Formerly ENGL 117W] Selected critical approaches to literature. [3] (HCA)

ENGL 1280. Beginning Fiction Workshop. [Formerly ENGL 122] Introduction to the art of writing prose fiction. [3] (HCA)

ENGL 1290. Beginning Poetry Workshop. [Formerly ENGL 123] Introduction to the art of writing poetry. [3] (HCA)

ENGL 1300W. Intermediate Composition. [Formerly ENGL 120W] A writing course including the analysis of essays from a variety of disciplines. [3] (HCA)

ENGL 2200. Foundations of Literary Study. [Formerly ENGL 199] Fundamentals of literary study: close reading; analytic writing; historical context; abstract reasoning in theory; creative expression. [3] (HCA)

ENGL 2310. Representative British Writers. [Formerly ENGL 208A] Selections from British literature with attention to contexts and literary periods. From the beginnings to 1660. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. [3] (HCA)

ENGL 2311. Representative British Writers. [Formerly ENGL 208B] Selections from British literature with attention to contexts and literary periods. From 1660 to the present. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. [3] (HCA)

ENGL 2316. Representative American Writers. [Formerly ENGL 211] Selections from the entire body of American literature with attention to contexts and literary periods. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. Repeat credit for students who have completed 2316W. [3] (US)

ENGL 2316W. Representative American Writers. [Formerly ENGL 211W] Selections from the entire body of American literature with attention to contexts and literary periods. Provides a broad background for more specialized courses and is especially useful for students considering advanced studies in literature. Repeat credit for students who have completed 2316. [3] (US)

ENGL 2318. World Literature, Classical. [Formerly ENGL 236] Great Books from the points of view of literary expression and changing ideologies: Classical Greece through the Renaissance. Repeat credit for students who have completed 2318W. [3] (HCA)

ENGL 2318W. World Literature, Classical. [Formerly ENGL 236W] Great Books from the points of view of literary expression and changing ideologies: Classical Greece through the Renaissance. Repeat credit for students who have completed 2318. [3] (HCA)

ENGL 2319. World Literature, Modern. [Formerly ENGL 237] Great Books from the points of view of literary expression and changing ideologies: The 17th century to the contemporary period. Repeat credit for students who have completed 2319W. [3] (HCA)

ENGL 2319W. World Literature, Modern. [Formerly ENGL 237W] Great Books from the points of view of literary expression and changing ideologies: The 17th century to the contemporary period. Repeat credit for students who have completed 2319. [3] (HCA)

ENGL 2320. Southern Literature. [Formerly ENGL 212] The works of Southern writers from Captain Smith to the present. Topics such as the Plantation Myth, slavery and civil war, Agrarianism, and "post-southernism." Authors may include Poe, Twain, Cable, Faulkner, Welty, Percy, Wright. [3] (HCA)

ENGL 3210. Intermediate Nonfiction Writing. [Formerly ENGL 200] Instruction in the forms and techniques of nonfiction writing. Admission by consent of instructor. May be repeated once for credit. [3] (HCA)

ENGL 3215. The Art of Blogging. Conventions of the rapidly evolving literary form of blogging. Creation and maintenance of a personal blog. Critique of online journalism across many genres, including activism, politics, science, and arts and culture. Interaction with professional bloggers. [3] (HCA)

ENGL 3220. Advanced Nonfiction Writing. [Formerly ENGL 201] Further instruction in the form and techniques of nonfiction writing. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3220] (HCA)

ENGL 3230. Intermediate Fiction Workshop. [Formerly ENGL 204] Instruction in fiction writing. Supplementary readings that illustrate traditional aspects of prose fiction. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3230] (HCA)

ENGL 3240. Advanced Fiction Workshop. [Formerly ENGL 205] Continuing instruction in fiction writing. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3240] (HCA)

ENGL 3250. Intermediate Poetry Workshop. [Formerly ENGL 206] Instruction in poetry writing. Supplementary readings illustrating traditional aspects of poetry. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3250] (HCA)

ENGL 3260. Advanced Poetry Workshop. [Formerly ENGL 207] Continuing instruction in poetry writing. Admission by consent of instructor. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3260] (HCA)

ENGL 3280. Literature and the Craft of Writing. [Formerly ENGL 202] The forms and techniques of creative writing. Contemporary practices in fiction and poetry in historical context. [3] (HCA)

ENGL 3310. Anglo-Saxon Language and Literature. [Formerly ENGL 219] The study of the Old English language. Selected historical and literary prose. Short heroic poems. [3] (HCA)

ENGL 3314. Chaucer. [Formerly ENGL 220] Study of *The Canterbury Tales* and Chaucer's world. [3] (HCA)

ENGL 3316. Medieval Literature. [Formerly ENGL 221] The drama, lyrics, romance, allegory, and satire of the fourteenth and fifteenth centuries,

studied in the context of the period's intellectual climate and social change. [3] (HCA)

ENGL 3318. The History of the English Language. [Formerly ENGL 240] The development of English syntax. History of the English vocabulary: word formation, borrowing, semantic change, and meter. [3] (HCA)

ENGL 3330. Sixteenth Century. [Formerly ENGL 248] Prose and poetry of the sixteenth century. Emphasis on Spenser and his contemporaries. [3] (HCA)

ENGL 3332. English Renaissance: The Drama. [Formerly ENGL 250] English drama, exclusive of Shakespeare, from 1550-1642: Marlowe, Jonson, Webster, and others. [3] (HCA)

ENGL 3335. English Renaissance Poetry. Development of the English poetic tradition from 1500-1700. Repeat credit for students who have earned credit for 3335W. [3] (HCA)

ENGL 3335W. English Renaissance Poetry. Development of the English poetic tradition from 1500-1700. Repeat credit for students who have earned credit for 3335. [3] (HCA)

ENGL 3336. Shakespeare. [Formerly ENGL 209A] About twenty of the major plays considered in chronological order over two terms, with emphasis on Shakespeare's development as a dramatic artist. Primarily comedies and histories. [3] (HCA)

ENGL 3337. Shakespeare. [Formerly ENGL 209B] About twenty of the major plays considered in chronological order over two terms, with emphasis on Shakespeare's development as a dramatic artist. Primarily tragedies and romances. [3] (HCA)

ENGL 3340. Shakespeare: Representative Selections. [Formerly ENGL 210] A representative selection of plays, including histories, tragedies, comedies, and romances, designed to give the student a sense of the full range of Shakespeare's work in one semester. Repeat credit for students who have completed 3340W. [3] (HCA)

ENGL 3340W. Shakespeare: Representative Selections. [Formerly ENGL 210W] A representative selection of plays, including histories, tragedies, comedies, and romances, designed to give the student a sense of the full range of Shakespeare's work in one semester. Repeat credit for students who have completed 3340. [3] (HCA)

ENGL 3346. Seventeenth-Century Literature. [Formerly ENGL 249] Poetry and prose from 1600 to the English Civil War, such as Metaphysical and Cavalier poetry, essays, romances, and satires. Authors may include Bacon, Cavendish, Donne, Herbert, Jonson, Lanier, Marvell, and Wroth. [3] (HCA)

ENGL 3348. Milton. [Formerly ENGL 251] The early English poems; *Paradise Lost*, *Paradise Regained*, and *Samson Agonistes*; the major prose. [3] (HCA)

ENGL 3360. Restoration and the Eighteenth Century. [Formerly ENGL 252A] Explorations of the aesthetic and social world of letters from the English Civil War to the French Revolution. Drama, poetry, and prose, including Restoration plays, political poetry, satire, travel narratives, and tales. Authors may include Behn, Dryden, Congreve, Addison, Swift, Finch, Pope, Fielding, Burney, Johnson, and Inchbald. Earlier writers. [3] (HCA)

ENGL 3361. Restoration and the Eighteenth Century. [Formerly ENGL 252B] Explorations of the aesthetic and social world of letters from the English Civil War to the French Revolution. Drama, poetry, and prose, including Restoration plays, political poetry, satire, travel narratives, and tales. Authors may include Behn, Dryden, Congreve, Addison, Swift, Finch, Pope, Fielding, Burney, Johnson, and Inchbald. Later writers. [3] (HCA)

ENGL 3364. The Eighteenth-Century English Novel. [Formerly ENGL 230] The English novel from its beginning through Jane Austen. Development of the novel as a literary form, and study of selected works of Defoe, Richardson, Fielding, Sterne, and other novelists of the period. [3] (HCA)

ENGL 3370. The Bible in Literature. [Formerly ENGL 282] An examination of ways in which the Bible and biblical imagery have functioned in literature and fine arts, in both "high culture" and popular culture, from Old English poems to modern poetry, drama, fiction, cartoons, and political

rhetoric. Readings include influential biblical texts and a broad selection of literary texts drawn from all genres and periods of English literature. [3] (HCA)

ENGL 3610. The Romantic Period. [Formerly ENGL 254A] Prose and poetry of the Wordsworths, the Shelleys, Byron, Keats, and others. [3] (HCA)

ENGL 3611. The Romantic Period. [Formerly ENGL 254B] Continuation of 3610. Prose and poetry of the Wordsworths, the Shelleys, Byron, Keats, and others. [3] (HCA)

ENGL 3614. The Victorian Period. [Formerly ENGL 255] Works of Tennyson, Browning, Arnold, Hardy, and others. [3] (HCA)

ENGL 3618. The Nineteenth-Century English Novel. [Formerly ENGL 231] The study of selected novels of Dickens, Thackeray, Emily Brontë, George Eliot, George Meredith, Thomas Hardy, and other major novelists of the period. [3] (HCA)

ENGL 3620. Nineteenth-Century American Literature. [Formerly ENGL 266] Explorations of themes, forms, and social and cultural issues shaping the works of American writers. Authors may include Cooper, Poe, Hawthorne, Douglass, Jacobs, Stowe, Melville, Dickinson, Alcott, Whitman, and Twain. [3] (HCA)

ENGL 3622. Nineteenth-Century American Women Writers. [Formerly ENGL 260] Themes and forms of American women's prose and poetry, with the emphasis on alternative visions of the frontier, progress, class, race, and self-definition. Authors include Child, Kirkland, Fern, Jacobs, Harper, Dickinson, and Chopin. [3] (HCA)

ENGL 3624W. Literature of the American Civil War. [Formerly ENGL 213W] Origins and impact of the war as depicted in short stories, novels, poems, and films. Harriet Beecher Stowe, Stephen Crane, Margaret Mitchell, William Faulkner, and Margaret Walker. [3] (US)

ENGL 3630. The Modern British Novel. [Formerly ENGL 233] The British novel from the beginning of the twentieth century to the present. Conrad, Joyce, Lawrence, Virginia Woolf, Forster, and other novelists varying at the discretion of instructor. [3] (HCA)

ENGL 3634. Modern Irish Literature. [Formerly ENGL 264] Major works from the Irish literary revival to the present, with special attention to the works of Yeats, Synge, Joyce, O'Casey, and Beckett. [3] (HCA)

ENGL 3640. Modern British and American Poetry: Yeats to Auden. [Formerly ENGL 256] A course in the interpretation and criticism of selected modern masters of poetry, British and American, with the emphasis on poetry as an art. Poets selected may vary at discretion of instructor. [3] (HCA)

ENGL 3642. Film and Modernism. [Formerly ENGL 265] Film in the context of the major themes of literary modernism: the divided self, language and realism, nihilism and belief, and spatialization of time. [3] (HCA)

ENGL 3644. Twentieth-Century American Novel. [Formerly ENGL 232A] Explorations of themes, forms, and social cultural issues shaping the works of American novelists. Authors may include Fitzgerald, Faulkner, Hemingway, Hurston, Ellison, McCarthy, Bellow, Kingston, Morrison, Pynchon. Emphasizes writers before 1945. [3] (HCA)

ENGL 3645. Twentieth-Century American Novel. [Formerly ENGL 232B] Explorations of themes, forms, and social cultural issues shaping the works of American novelists. Authors may include Fitzgerald, Faulkner, Hemingway, Hurston, Ellison, McCarthy, Bellow, Kingston, Morrison, Pynchon. Emphasizes writers after 1945. [3] (HCA)

ENGL 3646. Poetry Since World War II. [Formerly ENGL 258] Poets studied vary at discretion of instructor. Offered on a graded basis only. [3] (HCA)

ENGL 3650. Ethnic American Literature. [Formerly ENGL 279] Texts and theory relevant to understanding race, culture, and ethnicity in the formation of American culture. Literature from at least three of the following groups: African Americans, Native Americans, Asian Americans, Chicano/Latino Americans, Caribbean Americans, and European Americans. [3] (P)

ENGL 3650W. Ethnic American Literature. [Formerly ENGL 279W] Texts and theory relevant to understanding race, culture, and ethnicity

in the formation of American culture. Literature from at least three of the following groups: African Americans, Native Americans, Asian Americans, Chicano/Latino Americans, Caribbean Americans, and European Americans. [3] (P)

ENGL 3654. African American Literature. [Formerly ENGL 263] Examination of the literature produced by African Americans. May include literary movements, vernacular traditions, social discourses, material culture, and critical theories. Repeat credit for students who have completed 3654W. [3] (US)

ENGL 3654W. African American Literature. [Formerly ENGL 263W] Examination of the literature produced by African Americans. May include literary movements, vernacular traditions, social discourses, material culture, and critical theories. Repeat credit for students who have completed 3654. [3] (US)

ENGL 3658. Latino-American Literature. [Formerly ENGL 275] Texts and theory relevant to understanding constructs of Latino identity, including race, class, gender, and basis for immigration, in the context of American culture. The course focuses on the examination of literature by Chicano, Puerto Rican, Cuban, Dominican, and Latin American writers in the United States. [3] (P)

ENGL 3662. Asian American Literature. [Formerly ENGL 277] Diversity of Asian American literary production with specific attention to works after 1965. Topics such as gender and sexuality, memory and desire, and diaspora and panethnicity in the context of aesthetics and politics of Asian American experience. [3] (P)

ENGL 3662W. Asian American Literature. [Formerly ENGL 277W] Diversity of Asian American literary production with specific attention to works after 1965. Topics such as gender and sexuality, memory and desire, and diaspora and panethnicity in the context of aesthetics and politics of Asian American experience. [3] (P)

ENGL 3664. Jewish American Literature. [Formerly ENGL 283] Nineteenth century to the present. Issues of race, gender, ethnicity, immigration, and diaspora. Offered on a graded basis only. [3] (HCA)

ENGL 3670. Colonial and Post-Colonial Literature. [Formerly ENGL 278] Literature exploring European colonialism and its aftermath from the eighteenth century to the present: language, gender, and agency in the colonial encounter; anti-colonial resistance movements; and postcolonial cultures. Topics may vary; course may be taken more than once with permission of the Director of Undergraduate Studies. [3] (HCA)

ENGL 3670W. Colonial and Post-Colonial Literature. [Formerly ENGL 278W] Literature exploring European colonialism and its aftermath from the eighteenth century to the present: language, gender, and agency in the colonial encounter; anti-colonial resistance movements; and postcolonial cultures. Topics may vary; course may be taken more than once with permission of the Director of Undergraduate Studies. [3] (HCA)

ENGL 3674. Caribbean Literature. [Formerly ENGL 271] Caribbean literature from 1902 to the present. Emphasis on writing since 1952, which marks the beginning of West Indian nationalism and the rise of the West Indian novel. [3] (INT)

ENGL 3678. Anglophone African Literature. [Formerly ENGL 276] From the Sundiata Epic to the present with emphasis on the novel. Attention to issues of identity, post coloniality, nationalism, race, and ethnicity in both SubSaharan and Mahgrib literatures. Such authors as Achebe, Ngugi, Gordimer, Awoonor, and El Saadaw. [3] (INT)

ENGL 3680. Twentieth-Century Drama. [Formerly ENGL 286A] Topics in twentieth century drama drawn from the American, British, and/or world traditions. Formal structures of dramatic literature studied within contexts of performance, theatrical production, and specific dramatic careers. Authors may include O'Neill, Albee, Hansberry, Hellman, Stoppard, Wilson, and Churchill. Emphasizes American drama. [3] (US)

ENGL 3681. Twentieth-Century Drama. [Formerly ENGL 286B] Topics in twentieth century drama drawn from the American, British, and/or world traditions. Formal structures of dramatic literature studied within contexts of performance, theatrical production, and specific dramatic careers. Au-

thors may include O'Neill, Albee, Hansberry, Hellman, Stoppard, Wilson, and Churchill. Emphasizes British and world drama. [3] (US)

ENGL 3683. Contemporary British Literature. [Formerly ENGL 235] The novel, short story, and verse in Great Britain since World War II. [3] (HCA)

ENGL 3692. Desire in America: Literature, Cinema, and History. [Formerly ENGL 267] The influence of desire and repression in shaping American culture and character from the mid-nineteenth century to the present. [3] (US)

ENGL 3694. America on Film: Art and Ideology. [Formerly ENGL 268A] American culture and character through film, film theory, and literature. [3] (US)

ENGL 3695. America on Film: Performance and Culture. [Formerly ENGL 268B] Film performance in the construction of identity and gender, social meaning and narrative, public image and influence in America. [3] (US)

ENGL 3710. Literature and Intellectual History. [Formerly ENGL 214A] Fiction, poetry, and prose writings that represent overarching themes in English and/or American literature across conventional historical periods in order to define and trace their genealogy and evolution. [3] (HCA)

ENGL 3711. Literature and Intellectual History. [Formerly ENGL 214B] The emergence of modern consciousness in the nineteenth and twentieth centuries. [3] (HCA)

ENGL 3720. Literature, Science, and Technology. [Formerly ENGL 243] The relationship of science and technology to literature, film, and popular media. Focus on such topics as digital technology, genetics, and the representation of science in particular periods, genres, movements, and critical theories. Repeat credit for students who have completed 3720W. [3] (P)

ENGL 3720W. Literature, Science, and Technology. [Formerly 243W] The relationship of science and technology to literature, film, and popular media. Focus on such topics as digital technology, genetics, and the representation of science in particular periods, genres, movements, and critical theories. Repeat credit for students who have completed 3720. [3] (P)

ENGL 3726. New Media. [Formerly ENGL 259] History, theory, and design of digital media. Literature, video, film, online games, and other interactive narratives. [3] (HCA)

ENGL 3728. Science Fiction. [Formerly ENGL 242] Social and historical developments within the genre. Works from the late nineteenth century to the present. Cultural issues, including race, gender, sexuality, violence, and the representation of science. Repeat credit for students who have completed 3728W. [3] (P)

ENGL 3728W. Science Fiction. [Formerly ENGL 242W] Social and historical developments within the genre. Works from the late nineteenth century to the present. Cultural issues, including race, gender, sexuality, violence, and the representation of science. Repeat credit for students who have completed 3728. [3] (P)

ENGL 3730. Literature and the Environment. [Formerly ENGL 245] Environmental issues from British, American, and global perspectives. Methodological approaches such as ecocriticism, environmental and social justice, ethics, and activism. The role of literature and the imagination in responding to ecological problems and shaping environmental values. [3] (HCA)

ENGL 3734. Literature and Law. [Formerly ENGL 262] Study of the relationship between the discourses of law and literature. Focus on such topics as legal narratives, metaphor in the courts, representations of justice on the social stage. Repeat credit for students who have completed 3734W. [3] (HCA)

ENGL 3734W. Literature and Law. [Formerly ENGL 262W] Study of the relationship between the discourses of law and literature. Focus on such topics as legal narratives, metaphor in the courts, representations of justice on the social stage. Repeat credit for students who have completed 3734. [3] (HCA)

ENGL 3736. Words and Music. [Formerly ENGL 218] An investigation of works of literature that have inspired musical settings and the musical settings themselves. Emphasis on literary and musical analysis and interpretation. No musical background assumed. Repeat credit for students who have completed MUSL 2330. [3] (HCA)

ENGL 3740. Critical Theory. [Formerly ENGL 244] Major theoretical approaches that have shaped critical discourse, the practices of reading, and the relation of literature and culture. [3] (HCA)

ENGL 3742. Feminist Theory. [Formerly ENGL 246] An introduction to feminist theory. Topics include cross-cultural gender identities; the development of "masculinity" and "femininity"; racial, ethnic, class, and national differences; sexual orientations; the function of ideology; strategies of resistance; visual and textual representations; the nature of power. [3] (P)

ENGL 3744. Advanced Poetry. [Formerly ENGL 247] Formal analysis and close reading of major poems in the extended canon of British and American poetry. Related examples of historical, theoretical, and applied criticism. [3] (HCA)

ENGL 3746. Workshop in English and History. [Formerly ENGL 280] (Also listed as History 3746) Team-taught by a historian and an interdisciplinary scholar. Explores intersection of disciplines through close examination of texts in historical context. Preference to students majoring in the English-History program. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

ENGL 3748. Introduction to English Linguistics. [Formerly ENGL 241] Systematic study of present-day English sounds, words, sentences, and the contexts of language production. Contemporary varieties of English. [3] (HCA)

ENGL 3851. Independent Study. [Formerly ENGL 289A] Designed primarily for majors. Projects are arranged with individual professors and must be confirmed with the director of undergraduate studies within two weeks of the beginning of classes; otherwise the student will be dropped from the 3851 rolls. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of ENGL 3851 and 3852] (No AXLE credit)

ENGL 3852. Independent Study. [Formerly ENGL 289B] Designed primarily for majors. Projects are arranged with individual professors and must be confirmed with the director of undergraduate studies within two weeks of the beginning of classes; otherwise the student will be dropped from the 3852 rolls. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of ENGL 3851 and 3852] (No AXLE credit)

ENGL 3890. Movements in Literature. [Formerly ENGL 272] Studies in intellectual currents that create a group or school of writers within a historical period. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3890W. Movements in Literature. [Formerly ENGL 272W] Studies in intellectual currents that create a group or school of writers within a historical period. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3891. Special Topics in Creative Writing. [Formerly ENGL 291] Advanced instruction in creative writing in emerging modes and hybrid genres. [3] (HCA)

ENGL 3892. Problems in Literature. [Formerly ENGL 273] Studies in common themes, issues, or motifs across several historical periods. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3892W. Problems in Literature. [Formerly ENGL 273W] Studies in common themes, issues, or motifs across several historical periods. May be repeated for credit more than once if there is no duplication in topic.

Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3894. Major Figures in Literature. [Formerly ENGL 274] Studies in the works of one or two writers with attention to the development of a writer's individual canon, the biographical dimension of this work, and critical responses to it. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3894W. Major Figures in Literature. [Formerly ENGL 274W] Studies in the works of one or two writers with attention to the development of a writer's individual canon, the biographical dimension of this work, and critical responses to it. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3896. Special Topics in Investigative Writing in America. [Formerly ENGL 287] Course will be taught by a distinguished visiting journalist from a major U.S. newspaper or magazine. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3; maximum of 6 credits total for all semesters of ENGL 287] (No AXLE credit)

ENGL 3897. Special Topics in Critical Theory. Diverse range of literary, philosophical, cultural, and political texts. May be repeated for credit if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3] (HCA)

ENGL 3898. Special Topics in English and American Literature. [Formerly ENGL 288] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3898W. Special Topics in English and American Literature. [Formerly ENGL 288W] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

ENGL 3899. Special Topics in Film. [Formerly ENGL 269] Theory and practice of cinema as an aesthetic and cultural form. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 6 credits total for all semesters of ENGL 3899] (HCA)

ENGL 4960. Senior Year Capstone. [Formerly ENGL 299] Topic chosen by the instructor. Prerequisite: 2200. [3] (No AXLE credit)

ENGL 4998. Honors Colloquium. [Formerly ENGL 290A] Background for writing the honors thesis. Emphasis on research methods, critical approaches, and the students' own projects. Limited to seniors admitted to the English Honors Program. [3] (No AXLE credit)

ENGL 4999. Honors Thesis. [Formerly ENGL 290B] Prerequisite: 4998. [3] (No AXLE credit)

Environmental and Sustainability Studies

ENVS 1001. Commons iSeminar. [Formerly ENVS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ENVS 4101. Society and the Environment Capstone. [Formerly ENVS 278] The relationship between society and the environment. Sustainability, adaptation, climate science, and policy. Open only to junior and senior ENVS minors. [3] (SBS)

ENVS 4101W. Society and the Environment Capstone. The relationship between society and the environment. Sustainability, adaptation, climate science, and policy. Open only to junior and senior ENVS minors. Repeat credit for students who have completed ENVS 4101. [3] (SBS)

ENVS 4961. Special Topics. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

European Studies

EUS 1001. Commons iSeminar. [Formerly EUS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

EUS 2201. European Society and Culture. [Formerly EUS 201] An interdisciplinary survey of European society, culture, and politics since 1900. [3] (INT)

EUS 2203. The Idea of Europe. [Formerly EUS 203] European identity from ancient ideals to its reality as the European Union. Emphasis on Europe as cultural construct and definable space. Historical, political, religious, philosophical, and cultural movements for Europe's claim to legitimacy. [3] (INT)

EUS 2208. Conspiracy Theories and Rumors in European and U.S. History. [Formerly EUS 208] From 1600 to the present. Jesuits, Jews, and the Illuminati. The American and French Revolutions, McCarthyism, UFOs, and New World Order theories. [3] (INT)

EUS 2210. European Avant-Garde Movements. Twentieth-century European aesthetic, political, and social imagination from Expressionism and Dadaism to Fluxus and Happenings. Connection between aesthetics and capitalism. Impact of World Wars on art and literature, gender roles, and "exoticism." Art as an institution and literature as performance. [3] (INT)

EUS 2213. Introduction to European Intellectual Traditions: Ancient and Medieval. Philosophical, religious, and literary foundations. Texts by Homer, Virgil, Augustine, and Dante together with background from the Bible. [3] (HCA)

EUS 2220. Religion and Politics in Modern Europe, 1648-Present. [Formerly EUS 220] Toleration in the Enlightenment; the French Revolution; antisemitism; genocide; secularism and political Islam. [3] (INT)

EUS 2240. Topics in European Studies. [Formerly EUS 240] Topics of special interest on modern European culture or society. May be repeated for credit when topics vary. [3] (No AXLE credit)

EUS 2260. European Cities. [Formerly EUS 260] The history, politics, society, or culture of important European cities. Content varies according to location and disciplinary focus. The course is taught during the May Session in Europe with the cities themselves complementing daily lectures and site visits. Course requirements include preliminary work on campus, a research paper, and one or more examinations. May be repeated for credit in different cities. [3] (INT)

EUS 2800. Pursuing Utopia: Social Justice and Romanticism in the Alps. Social justice and literary experiments of writers who sought alternative approaches to art and society in the "neutral" Alpine settings of Europe. [3] (INT)

EUS 3850. Independent Readings and/or Research. [Formerly EUS 289A] Independent readings and/or research on approved topics relating to modern European society and culture. [Variable credit: 1-3 each semester, maximum of 6 hours in 3850 and 3851 combined] (No AXLE credit)

EUS 3851. Independent Readings and/or Research. [Formerly EUS 289B] Independent readings and/or research on approved topics relating to modern European society and culture. [Variable credit: 1-3 each semester, maximum of 6 hours in 3850 and 3851 combined] (No AXLE credit)

EUS 4960. Senior Tutorial. [Formerly EUS 250] Supervised readings, joint discussions, and independent research on a modern European topic to be selected in consultation with the director of European Studies. Open only to juniors and seniors. [3] (No AXLE credit)

EUS 4998. Senior Honors Research. [Formerly EUS 299A] Open only to seniors who have been admitted to the European Studies departmental honors program. [3] (No AXLE credit)

Financial Economics

FNEC 1600. Financial Accounting. [Formerly FNEC 140] Financial reporting and its relevance to the managerial environment. Financial statements from the perspectives of the preparer and the user. Not intended

for students pursuing the undergraduate business minor; students who complete BUS 2100 forfeit credit for 1600. [3] (No AXLE credit)

FNEC 2600. Managerial Accounting. [Formerly FNEC 220] Selected topics in managerial accounting. Prerequisite: 1600 or BUS 2100. [3] (SBS)

FNEC 2700. Corporate Finance. [Formerly FNEC 240] Investment and financial decisions faced by firms. Theoretical basis of corporate decision-making. Various accounting documents and the alternative objectives of firms, their management, and their owners. Attributes of firms that affect market value. How investment decisions and methods used by firms to finance these investments affect firm value. Not intended for students pursuing the undergraduate business minor; students who complete BUS 2300 forfeit credit for 2700. Prerequisite: 1600 and either ECON 1500, 1510, MATH 2820, PSY 2100, or PSY-PC 2101. [3] (SBS)

FNEC 2705. Advanced Corporate Finance. Strategic financial decisions. Corporate financial theory, cost of capital and capital budgeting, discounted cash flow valuation, and financial multiples. Payout policy, equity and debt financing, option pricing theory, and applications. Prerequisite: BUS 2300. [3] (SBS)

FNEC 3605. Financial Reporting and Analysis. [Formerly FNEC 2605] Selected topics in accounting and financial reporting. Cash flow statements, income taxes, long-term debt, and leases. Investments, derivative securities, contingencies, stockholders' equity, and purchase accounting. Prerequisite: BUS 2100. [3] (SBS)

FNEC 3700. Investment Analysis. [Formerly FNEC 261] Investment principles and practices. Security analysis and valuation. Portfolio theory. Current issues in the financial sector. Stock market simulation. Prerequisite: 2700 or BUS 2300. [3] (SBS)

FNEC 3705. Financial Management. [Formerly FNEC 275] Analysis of cases representing capital budgeting, forecasting cash flow, risk assessment, capital structure, and mergers and acquisitions. Seminar. Prerequisite: 2700 or BUS 2300. [3] (SBS)

FNEC 3710. Corporate Valuation. Intrinsic, relative, and contingent valuation methodologies. Theoretical and market basis for investment. Valuation project. Prerequisite: 2700 or BUS 2300. [3] (SBS)

FNEC 3851. Independent Study in Financial Economics. [Formerly FNEC 291A] A program of independent readings in financial economics arranged in consultation with an adviser. Prerequisite: written permission of an instructor and the program director. No credit for graduate students. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of FNEC 3851 and 3852] (No AXLE credit)

FNEC 3852. Independent Study in Financial Economics. [Formerly FNEC 291B] A program of independent readings in financial economics arranged in consultation with an adviser. Prerequisite: written permission of an instructor and the program director. No credit for graduate students. May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of FNEC 3851 and 3852] (No AXLE credit)

French

FREN 1001. Commons iSeminar. [Formerly FREN 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

FREN 1101. Introduction to French in the World. [Formerly FREN 101A] Reading, writing, speaking, and listening through an exploration of the French-speaking world. For students who have studied little or no French. No credit for students who have earned credit for a more advanced French language course. [3] (No AXLE credit)

FREN 1102. Introduction to French in the World. [Formerly FREN 101B] Continuation of 1101. Study of the language through an exploration of the French-speaking world. No credit for students who have earned credit for a more advanced French language course. [3] (INT)

FREN 1103. Accelerated Introduction to French in the World. [Formerly FREN 102] Intensive course for students who have studied one to three years of French. No credit for students who have earned credit for 1101, 1102, or a more advanced French language course. [3] (INT)

FREN 1111. First-Year Writing Seminar. [Formerly FREN 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

FREN 2203. Intermediate French Language and Cultures. French and Francophone cultures through readings, film, and discussion. Designed for students who have completed elementary-level French. No credit for students who have earned credit for a more advanced French language course. Prerequisite: 1102 or 1103. [3] (INT)

FREN 2332. Popular Music and Social Change in France and the Francophone World. Culture and history. Popular musical production in France, Canada, Haiti, the Caribbean, the Maghreb, and Africa. Granular analyses of musical and lyrical content; how popular music both spearheaded and reflected social issues and change, especially beginning in the 1960s. Prerequisite 2501W. [3] (INT)

FREN 2501W. French Composition and Grammar. [Formerly FREN 201W] Prerequisite: 2203 or the equivalent. No graduate credit. No credit for students who have earned credit for a more advanced French language course. [3] (INT)

FREN 2611. Phonetics. [Formerly FREN 203] Methodical comparison of French and English sounds. Correct formation of French sounds; oral exercises and aural training. Prerequisite: 2501W. [3] (INT)

FREN 2614. Advanced Conversational French. [Formerly FREN 214] Emphasis on idiomatic usage and strategies for oral communication. Prerequisite: 2501W. [3] (P)

FREN 3101. Texts and Contexts: Middle Ages to the Enlightenment. [Formerly FREN 211] Literature and culture in historical contexts. Offered on a graded basis only. Prerequisite: 2501W. [3] (HCA)

FREN 3102. Texts and Contexts: Revolution to the Present. [Formerly FREN 212] Literature and culture in historical contexts. Offered on a graded basis only. Prerequisite: 2501W. [3] (HCA)

FREN 3111. French for Business. [Formerly FREN 204] Specialized vocabulary of business terms, business letters, and exercises in comprehension and translation. Prerequisite: 2501W. [3] (INT)

FREN 3112. Medical French in Intercultural Contexts. [Formerly FREN 205] Advanced conversation course dealing with medical issues in the Francophone world. Prerequisites: 2501W. [3] (HCA)

FREN 3113. Advanced French Grammar. [Formerly FREN 226] A systematic review with particular attention to morphology and syntax. Prerequisite: 2501W. [3] (INT)

FREN 3185W. The Refugee Experience in France and Italy. French and Italian culture, migration, global studies, refugees. Legal issues, current events, and cultural representation of vulnerable migrants. Taught in English. [3] (P)

FREN 3222. The Early Modern Novel. [Formerly FREN 237] Development of the novel as a genre in the seventeenth and eighteenth centuries; its changing social, intellectual, and political context. Prerequisite: 2501W. [3] (HCA)

FREN 3224. Media Medievalisms. [Formerly FREN 234] Pre-modern French society through medieval literature and history. Study of the imagined society recreated in modern medieval and Renaissance "fares," films, novels, and video games. Prerequisite: 2501W. [3] (HCA)

FREN 3230. French and Francophone Cinema. [Formerly FREN 210] The themes and art of film in France and the French-speaking world. Offered in French at Vanderbilt in France and in English at Nashville. When

offered in English, this course does not count toward the minor, and writing must be done in French to count toward the major. [3] (INT)

FREN 3232. Introduction to Francophone Literature. [Formerly FREN 222] The geopolitical, linguistic, and literary dimensions of the notion "La Francophonie." Readings will be chosen from fictional and nonfictional works from Africa, Canada, the Caribbean, countries bordering the Indian Ocean, and Vietnam. Prerequisite: 2501W. [3] (P)

FREN 3233. Francophone Caribbean Literature. [Formerly FREN 242] Major literary works of Haiti, Martinique, Guadeloupe, and French Guyana. Historical, geographic, and cultural context. Comparative approaches to the Hispanic and Anglophone Caribbean. Prerequisite: 2501W. [3] (INT)

FREN 3234. Contemporary Francophone Press. [Formerly FREN 219] Critical study of the Francophone press (print, television, radio, internet) in Europe, Africa, Canada, Louisiana, Islands in the Caribbean and Indian Ocean (Madagascar, Seychelles). Current issues in the media. Comparisons with the U.S. press. Prerequisite: 2501W. [3] (HCA)

FREN 3620. Age of Louis XIV. [Formerly FREN 261] Literature and society in the reign of Louis XIV. Authors include Mme de Lafayette, La Fontaine, Molière, Pascal, Racine, and Mme de Sévigné. Prerequisite: 2501W. [3] (HCA)

FREN 3621. Enlightenment and Revolution. [Formerly FREN 260] Major writers of the eighteenth century, including Montesquieu, Voltaire, Rousseau, Diderot; literature of the Revolution. [3] (HCA)

FREN 3634. Parisian Geographies: Paris in 19th and 20th century Art and Literature. The changing physical landscape and cultural significance of Paris in literature, painting, photography, and film of the 19th and 20th centuries. No credit for students who have earned credit for 3891 offered Fall 2018. Prerequisite 2501W. [3] (HCA)

FREN 3730. The Beat Generation's French Connection. [Formerly FREN 266] The Beats' ties to Paris and to Quebec through French-Canadian Jack Kerouac. Antonin Artaud, Jean Genet, Arthur Rimbaud, and Marquis de Sade. Prerequisite: 2501W. [3] (INT)

FREN 3850. Independent Study. [Formerly FREN 289] Content varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available in the regular curriculum. May be repeated for a total of 12 credits over a four-semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of FREN 3850] (No AXLE credit)

FREN 3880. Internship Training in France. [Formerly FREN 287B] Under faculty supervision, students intern in public or private organizations, and complete research and readings. Offered on a pass/fail basis only and must be taken concurrently with 3881. Corequisite: 3881. [1] (No AXLE credit)

FREN 3881. Internship Readings and Research in France. [Formerly FREN 287A] Under faculty supervision, students intern in public or private organizations, and complete research and readings. Must be taken concurrently with 3880. Corequisite: 3880. [3] (No AXLE credit)

FREN 3891. Special Topics in Traditions. [Formerly FREN 294] Topics vary. Prerequisite: 2501W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

FREN 3892. Special Topics in Communications and Intersections. [Formerly FREN 295] Topics vary. Prerequisite: 2501W. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

FREN 4023. The African Novel. [Formerly FREN 239] The postcolonial Francophone novel of Subsaharan Africa illustrating topics such as tradition and modernity, the identity of Africa, the representation of women, and the ideology of language. Prerequisite: 2501W. [3] (INT)

FREN 4027. Emile Zola: From Naturalist Novels to Social Activism. [Formerly FREN 241] The author's method of researching subject matter and style of writing. "Environmental" influences of violence, prostitution,

and alcoholism. The idea of the “public intellectual.” Prerequisite: 2501W. [3] (HCA)

FREN 4029. Twentieth-Century French Literature. [Formerly FREN 267] Critical readings of representative works organized thematically with emphasis on their contextual and intertextual relationships. Prerequisite: 2501W. [3] (HCA)

FREN 4232. Literature and Law. [Formerly FREN 252] Confessions, murder, argumentation, interpretation, and the representation of “the criminal” in literary and legal texts from traditional French writings. Offered on a graded basis only. Prerequisite: 2501W. [3] (P)

FREN 4234. Dangerous Bodies: Women in 19th Century Art and Literature. Nineteenth century novels and poetry with an emphasis on representations of the female body. Painting and photography. No credit for students who have earned credit for 3891 offered Fall 2017. Prerequisite: French 2501W. [3] (HCA)

FREN 4320. French Women and Feminisms. [Formerly FREN 255] Feminist themes in twentieth-century French literature and criticism. Authors include Beauvoir, Duras, Sarraute, Irigaray, Cixous. Prerequisite: 2501W. [3] (P)

FREN 4430. Minority Issues & Immigration in France. [Formerly FREN 258] Conflict between Jews and Arab-Muslims in France through analyses of historical accounts, news reports, and literary and cultural manifestations. From the origins of Zionism (~1885), to the Holocaust, and to the Intifadas of 1987 and 2000 and the Charlie Hebdo and kosher supermarket massacres of 2015 in Paris. Prerequisite 2501W. [3] (P)

FREN 4432. French Intellectual History. [Formerly FREN 256] From Montaigne to Sartre and beyond. Critical discourses and major philosophical texts. Prerequisite: 2501W. [3] (HCA)

FREN 4998. Senior Honors Thesis. [Formerly FREN 299A] [3] (No AXLE credit)

FREN 4999. Senior Honors Thesis. [Formerly FREN 299B] [3] (No AXLE credit)

German

GER 1001. Commons iSeminar. [Formerly GER 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

GER 1101. Elementary German I. [Formerly GER 101] Development of the four language skills of reading, listening, speaking, and writing. No credit for students who have earned credit for a more advanced German language course. [3] (No AXLE credit)

GER 1102. Elementary German II. [Formerly GER 102] Continuation of 1101. No credit for students who have earned credit for a more advanced German language course. Prerequisite: 1101. [3] (INT)

GER 1111. First-Year Writing Seminar. [Formerly GER 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

GER 1442. War on Screen. [Formerly GER 182, GER 2442] Representations of World War II and the fight against Nazi Germany in Hollywood and other cinemas, contemporary video games, television, and installation art. How current modes of warfare and the global war on terror have changed the conventions of depicting war. Taught in English. [3] (HCA)

GER 1482. Borders and Crossings: German Literature and Culture from Romanticism to the Present. [Formerly GER 172] Textual and visual contributions to German culture from the nineteenth and twentieth centuries in English translation. Borders—physical, ideological, intellectual, and metaphorical—and crossing these borders, as passages to more creative or liberated states of being, or as acts of transgress. Taught in English. [3] (HCA)

GER 2201. Intermediate German I. [Formerly GER 103] Intensive review of German grammar as a basis for reading, conversation, and composition. Texts and discussions address issues in contemporary German society. No credit for students who have earned credit for a more advanced German language course. Prerequisite: 1102. [3] (INT)

GER 2202. Intermediate German II. [Formerly GER 104] Practice in reading, listening, speaking, and writing. Short stories, one longer work (Kafka), and discussions examine aspects of modern life from a German perspective. No credit for students who have earned credit for a more advanced German language course. Prerequisite: 2201. [3] (INT)

GER 2217. Advanced Grammar. [Formerly GER 220] Study of word formation and sentence structure in modern German, supplemented by contemporary readings, with discussion. Not open to students who have participated in the Regensburg exchange program. [3] (INT)

GER 2400. Berlin: History, Culture, and Art. Maymester: visits to museums, site of the former Berlin Wall, Holocaust Memorial, and observation of German parliament in session. Daily reading and excursions. Taught in English [3] (INT)

GER 2432. Soccer: Media, Art, and Society. Relationship of soccer to political power, globalization, mass media, gender, migration, national identity, and transnational commerce. History of the game and its tactics. Representations of soccer in various artistic media such as literature, film, poetry, and video art. Taught in English. Not open to students who have earned credit for GER 1111.09. [3] (INT)

GER 2440. History of German Thought. From the Enlightenment to the present. German philosophy and critical theory in their social and political context. History of German intellectual movements. German thought as part of German culture. Taught in English. [3] (HCA)

GER 2441. Great German Works in English. [Formerly GER 183] German literature and culture from 1750 to present. The relationship of culture and history, changing notions of individual and community, modern sensibilities expressed in various genres. Goethe, Nietzsche, Freud, Kafka, and Jelinek. Knowledge of German not required. [3] (INT)

GER 2443. German Cinema: Vampires, Victims, and Vamps. [Formerly GER 270] An analysis of representative German film with special emphasis on its sociocultural and historical context. Discussion will include pertinent theories of cinematography and cinematic narration. Taught in English. [3] (INT)

GER 2444. German Fairy Tales: From Brothers Grimm to Walt Disney. [Formerly GER 244] The German fairy tale tradition and its role in American culture. Taught in English. [3] (INT)

GER 2445. Nazi Cinema: The Manipulation of Mass Culture. [Formerly GER 273] Nazi manipulation of mass culture through film (propaganda, musicals, westerns). Some comparison with American film of the era, additional examination of “fascist” aesthetic legacy in American culture today. No knowledge of German required. [3] (P)

GER 2551. Topics: Pre-18th Century Culture and Literature (ENGL). German-speaking cultures and their literatures from 8th to the early 18th century. Taught in English. May be repeated for credit if there is no duplication in topic. [3] (INT)

GER 2552. Topics: 18th and 19th Century Culture and Literature (ENGL). Literature, philosophy, art, and politics, 1750-1914, of German-speaking cultures. Taught in English. May be repeated for credit if there is no duplication in topic. [3] (INT)

GER 2553. Topics: 20th and 21st Century Culture and Literature (ENGL). Literature, history, aesthetics, and politics in German-speaking cultures from Dada to the present. Taught in English. May be repeated for credit if there is no duplication in topic. [3] (INT)

GER 2554. Topics in Visual Culture and Media (ENGL). Cinema, media arts, visual culture, and media history of German-speaking cultures from pre-digital to the digital age. Taught in English. May be repeated for credit if there is no duplication in topic. [3] (HCA)

GER 2555. Topics in German Studies (ENGL). Seminal aspects of German literature, culture, and civilization through interdisciplinary focus.

Taught in English. May be repeated for credit if there is no duplication in topic. [3] (INT)

GER 2556. Topics in Intellectual History (ENGL). Major trends and figures from the Enlightenment to the contemporary age. Taught in English. May be repeated for credit if there is no duplication in topic. [3] (HCA)

GER 2557. Topics in Genre (ENGL). Main genres of German literature and culture. Relationship between genres and the social, political, and cultural developments that lead to their formation and transformation. Taught in English. May be repeated for credit if there is no duplication in topic. [3] (HCA)

GER 2563. Twentieth-Century Germany. [Formerly HIST 230] The turbulent history of Germany, as it went from authoritarian state to volatile democracy, to National Socialist dictatorship, to divided country, and to reunification. Special emphasis placed on the Nazi dictatorship, its origins and legacy. [3] (INT)

GER 2570. The Holocaust. The history of the Holocaust: its origins, development, and its legacy in the context of Germany and European history. [3] (INT)

GER 2581. Nineteenth-Century Philosophy. A study of selected themes and writings from nineteenth-century European philosophers. [3] (INT)

GER 2585. Critical Theory. The Frankfurt School; mass culture, ideology, and modernism in the arts; the disenchantment of reason; alienation and fascism; the prospects for experience and political critique. Readings include Adorno, Horkheimer, Marcuse, Benjamin, and Habermas. [3] (HCA)

GER 2745. Radical Art: The Avant-Garde Revolution. Introduction to experimental art—both verbal and visual—in the 1910s–1930s. Movements studied: Cubism, Futurism, Dadaism, Suprematism, Constructivism, and Surrealism through the avant-garde’s engagement with various genres and media: the manifesto, performance, sound and image poetry, painting, photomontage, artist’s book, magazine, film and architecture. Taught in English. [3] (INT)

GER 3201. Advanced German: Germany Today. German culture, politics, social issues. News media and current events. Development of advanced written and oral communication skills. Offered on a graded basis only. Prerequisite: 2202. [3] (INT)

GER 3202W. Advanced German: Reading, Writing, Analysis. Subtleties of style. Different vocabularies of textual and cultural criticism. Analysis of wide range of text genres and cultural materials. Offered on graded basis only. Prerequisite: 2202. [3] (INT)

GER 3323. From Language to Literature. [Formerly GER 223] Continuing practice in reading, listening, speaking, and writing; emphasis on literary terminology and techniques for critical reading of German. Recommended as preparation for more advanced literary study, prose, poetry, and drama. Prerequisite: 2320. [3] (HCA)

GER 3343. The Aesthetics of Violence. [Formerly GER 243] The “dark” side of imagination in twentieth-century German literature including history and theory of modern art, emphasis on literary representation, mutual influences between aesthetic reflection and political action. No knowledge of German required. [3] (P)

GER 3344. German-Jewish Women Writers. [Formerly GER 271] Examination of themes, forms, and sociocultural issues shaping the work of German-Jewish women writers from the Enlightenment to the present. Readings and discussions in English. [3] (HCA)

GER 3345. Love and Friendship. [Formerly GER 245] Concepts of life and friendship, Greek antiquity to Romanticism, modern and postmodern times. Philosophical and literary texts, letters, and essays. Taught in English. [3] (No AXLE credit)

GER 3375. Art and Rebellion: Literary Experiment in the 1960s and 1970s. [Formerly GER 275] German literature under the conditions of protest and rebellion. Experiments in poetry, prose, and theatre; new directions in art and media theory; historical influences. Taught in English. [3] (HCA)

GER 3378. Dreams in Literature. [Formerly GER 278] The difference between sleeping and being awake. Literary and philosophical texts. Novels,

short stories, diaries, poems, and drama written within the last two hundred years. Prerequisite: 2202. [3] (HCA)

GER 3851. Independent Readings. [Formerly GER 289A] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1–3; maximum of 6 credits total for four semesters of GER 3851 and 3852] (No AXLE credit)

GER 3852. Independent Readings. [Formerly GER 289B] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1–3; maximum of 6 credits total for four semesters of GER 3851 and 3852] (No AXLE credit)

GER 3890. Selected Topics. [Formerly GER 294A] May be repeated for a total of 12 credits in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 12 credits total for all semesters of GER 3890 and 3891] (No AXLE credit)

GER 3891. Selected Topics. [Formerly GER 294B] May be repeated for a total of 12 credits in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course per semester. [3; maximum of 12 credits total for all semesters of GER 3890 and 3891]. (No AXLE credit)

GER 4535. German Romanticism. [Formerly GER 235] The contributions of Schlegel, Tieck, Novalis, Eichendorff, and others to literature, philosophy, and theory. Intellectual, social, and political currents. [3] (INT)

GER 4537. Women and Modernity. [Formerly GER 237] Women in German literature from the eighteenth century to the present, focusing on questions of sexuality, political emancipation, artistic identity. No knowledge of German required. [3] (INT)

GER 4551. Topics: Pre-18th Century Culture and Literature (GER). German-speaking cultures and their literatures from 8th to the early 18th century. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (INT)

GER 4552. Topics: 18th and 19th Century Culture and Literature (GER). Literature, philosophy, art, and politics, 1750–1914, of German-speaking cultures. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (INT)

GER 4553. Topics: 20th and 21st Century Culture and Literature (GER). Literature, history, aesthetics, and politics in German-speaking cultures from Dada to the present. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (INT)

GER 4554. Topics in Visual Culture and Media (GER). Cinema, media arts, visual culture, and media history of German-speaking cultures from pre-digital to the digital age. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (HCA)

GER 4555. Topics in German Studies (GER). Seminal aspects of German literature, culture, and civilization through interdisciplinary focus. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (INT)

GER 4556. Topics in Intellectual History (GER). Major trends and figures from the Enlightenment to the contemporary age. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (HCA)

GER 4557. Topics in Genre (GER). Main genres of German literature and culture. Relationship between genres and the social, political, and cultural developments that lead to their formation and transformation. May be repeated for credit if there is no duplication in topic. Prerequisite: 3201 and 3202W. [3] (HCA)

GER 4558. Business German. [Formerly GER 216, 2216] The culture of the German business community; differences that hinder communication between German-speakers and non-German-speakers in the business setting; development of aural, oral, and written skills. Business practices in German-speaking countries: advertising and marketing strategies, letters, vitae, phone calls, and personal interviews. Prerequisites: 3201. [3] (INT)

GER 4563. The Age of Goethe-Weimar 1775 to 1805. [Formerly GER 263] Rational pragmatism, aesthetic innovation in response to Kant and French Revolution. Readings drawn from Goethe's *Iphigenia*, *Hermann und Dorothea*, Schiller's *Maria Stuart* and *Wallenstein*, and Wieland's *Oberon*. [3] (INT)

GER 4564. Pleasures and Perils in Nineteenth-Century Theatre. [Formerly GER 264] The German drama and dramatic theory from Romanticism up to Naturalism with emphasis on selected works by Kleist, Büchner, Grillparzer, and Hebbel. [3] (INT)

GER 4565. Revolutionizing Twentieth-Century Theatre. [Formerly GER 265] German drama and dramatic theory from Naturalism to the present. Emphasis on Brecht and post-Brechtian drama. [3] (INT)

GER 4566. Nineteenth-Century Prose. [Formerly GER 266] A study of representative works of the main literary trends from Romanticism to Naturalism. [3] (INT)

GER 4567. The German Novel from Kafka to Grass. [Formerly GER 267] A study and interpretation of the main literary trends and major figures in twentieth-century narrative. [3] (INT)

GER 4569. Writing under Censorship. [Formerly GER 269] An introduction to the main literary trends and authors of the former East Germany (1949-1989). [3] (HCA)

GER 4574. Who Am I? German Autobiographies. [Formerly GER 274] Canonical and non-canonical texts from the nineteenth and twentieth centuries constructing cultural, religious, and gender identities. Taught in English. [3] (HCA)

GER 4576. Tales of Travel in Modern German Culture. [Formerly GER 276] German curiosity about other cultures from the late eighteenth century to the present. The role of travel in German culture. The ways in which German poets, artists, and filmmakers have embraced different social and natural settings as sites of inspiration, self-discovery, and transformation. All readings and discussion in German. Prerequisite: 2310W. [3] (INT)

Greek

GRK 1101. Beginning Greek I. [Formerly GRK 201] Classical Greek. Reading of simplified texts from authors of the fifth and fourth centuries BCE. No credit for students who have earned credit for a more advanced Greek language course. Graded basis only. [3] (No AXLE credit)

GRK 1102. Beginning Greek II. [Formerly GRK 202] Readings from classical authors. Introduction to Homeric and Hellenistic Greek. No credit for students who have earned credit for a more advanced Greek language course. Graded basis only. Prerequisite: 1101. [3] (INT)

GRK 1103. Intensive Elementary Greek. The equivalent of Greek 1101 and 1102. The elements of the Greek language at an accelerated pace. No credit for students who have earned credit for 1101, 1102, or a more advanced Greek language course. [5] (INT)

GRK 2201. Intermediate Greek I: Classical and Koiné Greek. [Formerly GRK 203] Review of Greek grammar, and reading from classical and biblical texts. Prerequisite: 1102. No credit for students who have earned credit for a more advanced Greek language course. [3] (INT)

GRK 2202. Intermediate Greek II: Homer's *Iliad*. [Formerly GRK 204] Selected reading and interpretation; history and literary characteristics of the Homeric epic; practice in reading of meter. Prerequisite: 2201. No credit for students who have earned credit for a more advanced Greek language course. [3] (INT)

GRK 3010. The Greek Orators. [Formerly GRK 210] Classical Athenian orators, with a focus on Lysias and Demosthenes. Historical context, rhetorical technique, and prose style. Prerequisite: 2202. [3] (HCA)

GRK 3020. The Greek Historians. [Formerly GRK 212] Selections from the major Greek historians, especially Herodotus and Thucydides, and study of their philosophy of history; investigation of the development of historical prose writing. Prerequisite: 2201. [3] (HCA)

GRK 3040. Readings in Plato and Aristotle. [Formerly GRK 216] Selected readings from the dialogues of Plato and from the ethical writings of Aristotle. Corollary readings and discussions of the pre-Socratic philosophers and the post-Aristotelian schools. Prerequisite: 2202. [3] (HCA)

GRK 3100. The Greek Tragedians. [Formerly GRK 215] Selections from the plays of Aeschylus, Sophocles, and Euripides. Survey of the development of tragedy. May be repeated for credit with change of subject matter. Prerequisite: 2202. [3] (HCA)

GRK 3110. Greek Lyric Poetry. [Formerly GRK 218] The Greek melic, elegiac, and iambic traditions; with an introduction to the Greek dialects and special emphasis on Archilochus, Tyrtaeus, Alcaeus, and Sappho. Prerequisite: 2202. [3] (HCA)

GRK 3200. Early Christian Writers. [Formerly GRK 240] Writings from the New Testament to critical works and letters by the Cappadocian fathers. Historical and intellectual context. Rhetoric and style. The Roman East. Prerequisite: 2201. [3] (HCA)

GRK 3850. Independent Study. [Formerly GRK 289] Designed for majors wanting to familiarize themselves with works and authors not covered in the regular curriculum. Prerequisite: 6 hours above 2202. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of GRK 3850] (No AXLE credit)

GRK 3890. Special Topics in Greek Literature. [Formerly GRK 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

Hebrew

HEBR 1101. Elementary Hebrew. [Formerly HEBR 111A] Introduction to alphabet, the basics of grammar, and elementary conversation. Classes meet three times per week with an additional two hours a week required in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. [4] (No AXLE credit)

HEBR 1102. Elementary Hebrew. [Formerly HEBR 111B] Continuation of 1101. Greater stress upon conversation and grammar. Classes meet three times a week with an additional two hours a week required in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 1101. [4] (INT)

HEBR 2201. Intermediate Hebrew. [Formerly HEBR 113A] Introduction to modern Hebrew reading, conversation, advanced grammar, and conversation. Classes meet three times a week with an additional three hours a week spent in independent work in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 1102. [3] (INT)

HEBR 2202. Intermediate Hebrew. [Formerly HEBR 113B] Continuation of 2201. Greater emphasis on reading and writing. Classes meet three times a week with an additional three hours a week spent in independent work in the language laboratory. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 2201. [3] (INT)

HEBR 2301. Advanced Hebrew Grammar. [Formerly HEBR 201] Emphasis on syntax and grammar supplemented by listening, speaking, and reading. No credit for students who have earned credit for a more advanced Hebrew language course. Prerequisite: 2202. [3] (INT)

HEBR 2302W. Advanced Hebrew Composition. [Formerly HEBR 202W] Development of writing skills through the study of short stories, poems, articles, television, and web materials. Prerequisite: 2301. [3] (INT)

HEBR 3851. Independent Study in Modern Hebrew. [Formerly HEBR 289A] May be repeated for a total of 6 credits in 3851 and 3852 combined

if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total in HEBR 3851 and 3852] (No AXLE credit)

HEBR 3852. Independent Study in Modern Hebrew. [Formerly HEBR 289B] May be repeated for a total of 6 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total in HEBR 3851 and 3852] (No AXLE credit)

Hindi-Urdu

HNUR 1101. Elementary Hindi-Urdu I. Speaking-listening skills and basic grammar. Introduction to reading and writing in Devanagari (Hindi) and Nastaliq (Urdu) scripts and to South Asian cultural materials. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. [5] (No AXLE credit)

HNUR 1102. Elementary Hindi-Urdu II. Reading, writing, speaking, and listening. Cultural contexts of speaking Hindi-Urdu. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. Prerequisite: 1101. [5] (INT)

HNUR 2201. Intermediate Hindi-Urdu I. Conversational skills, writing, vocabulary, and grammar. Reading texts in Devanagari (Hindi) and Nastaliq (Urdu) scripts. Discussion of cultural materials in Hindi-Urdu. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. Prerequisite: 1102. [5] (INT)

HNUR 2202. Intermediate Hindi-Urdu II. Reading, writing, speaking, and listening with authentic materials. Common and specialized vocabulary. Cultural contexts of spoken Hindi-Urdu. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. Prerequisite: 2201. [5] (INT)

HNUR 3301. Advanced Hindi-Urdu I. Reading, writing, speaking, and listening with authentic materials. Advanced vocabulary, literary, and cultural studies. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. Prerequisite: 2202. [3] (INT)

HNUR 3302. Advanced Hindi-Urdu II. Reading, writing, speaking, and listening with authentic materials. Advanced vocabulary, literary, and cultural studies. No credit for students who have earned credit for a more advanced Hindi-Urdu language course. Prerequisite: 3301. [3] (INT)

History

HIST 1001. Commons iSeminar. [Formerly HIST 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

HIST 1038. Language(s) in the World. Origins and varieties of language communication, its classification and study. Languages of empires. Bible as historical vehicle for language development and writing. Intersections of language and religion. Dialect and translation; communication alternatives including non-spoken, artificial, and non-human languages. Rap. Taboos. Language death. [3] (INT)

HIST 1039. Global History 1453 to Present. Global interaction and the international order. Methodological approaches. Patterns in global flows of people, capital, goods, and ideas. History of human contact, productive capabilities, wealth, and inequalities. Regimes of human differentiation and power, war and peace. [3] (INT)

HIST 1040W. Revolutions in the Modern World. Age of Democratic Revolution to the Arab Spring. U.S., French, Haitian, Russian, Iranian Revolutions. Overthrow of traditional regimes; invention of revolutionary states. Democracy, rights, Marxism. Nature of legal, social, and economic change. Radicalization and violence. Global influence and legacy. Offered on a graded basis only. [3] (INT)

HIST 1050. East Asia since 1800. [Formerly HIST 105] Traditional orders in China, Japan, Korea, and Vietnam. Encroachment of European empires. Nineteenth- and twentieth-century social and political revolutions. Japanese imperialism and the invention of pan-Asianism. WWII in the Pacific;

the rise and persistence of Communism. East Asia as a new center of the global economy in the twenty-first century. [3] (INT)

HIST 1060. Premodern China. [Formerly HIST 106] The development of Chinese civilization from ancient times to the seventeenth century. The birth and development of the Chinese identity; Confucianism, Taoism and Buddhism; the moral, military, and bureaucratic foundations of the imperial institution; the Silk Road; eunuchs and concubines; the commercial revolution. [3] (INT)

HIST 1070. China from Empire to the People's Republic. [Formerly HIST 107] From the seventeenth century to the present. The establishment and expansion of the Qing empire and its clashes with European empires. Twentieth-century revolutions and war with Japan. Mao and the making of the Communist state; post-Mao economic and social reforms. Tibet and ethnic minority issues. [3] (INT)

HIST 1080. Premodern Japan. [Formerly HIST 108] Japanese civilization from ancient times to the Meiji Restoration (1868). Connections between culture and politics; relations with neighboring regions in East Asia. [3] (INT)

HIST 1090. Modern Japan. [Formerly HIST 109] The political, social, economic, and cultural history of Japan in the nineteenth century to the present. Radical changes in the state, society, and economy and the effects of these changes on Japan's place in the world. [3] (INT)

HIST 1111. First-Year Writing Seminar. [Formerly HIST 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

HIST 1160. Modern South Asia. [Formerly HIST 116] Early modern South Asia to British imperialism and the independence of India and Pakistan. Colonial society, political movements, caste, gender, and religious "reform." Mass nationalism and Gandhi, religious conflict, and the partition of India and Pakistan. Debates on history and memory. [3] (INT)

HIST 1161. India Before Europe: 3000 B.C.E.-1750 C.E. South Asia from Indus Valley civilization to British imperialism. Era of Vedas, epics, Mauryas, and Guptas. Rise of Buddhism and Jainism. Overseas expansion and trade with Southeast Asia. Early encounters with Islam, followed by Turkic and Mughal rule over north India. Portuguese, Dutch, and British trading ventures in India. End of Mughal rule and beginning of British empire. [3] (INT)

HIST 1190. A History of Islam. [Formerly HIST 119] Origins to the present, with emphasis on the modern era. Early and medieval Islam, modernism and fundamentalism. Arabia and the Wahhabis, Iran and Shi'ism, South Asian syncretism, Muslim minorities in Western Europe and the United States. Recent Islamic views on human rights, science, economics, and other religions. [3] (INT)

HIST 1200. The Arab Spring. [Formerly HIST 120] Roots of the movement and the course of events. The role played by the West and by print and other media. Ideologies throughout the Islamic world. Prospects for the future. [3] (INT)

HIST 1269. Introduction to African Studies. Interdisciplinary exploration of the African experience. Human origins, geography, race and ethnicity, and historical and contemporary issues. Shifting theoretical constructions of Africa alongside the social, cultural, political, and economic forces at play across the continent. [3] (INT)

HIST 1270. Sub-Saharan Africa: 1400-1800. [Formerly HIST 127] Pre-colonial history of West and Central Africa. The rise of early empires; cultural history of major groups, the spread of Islam; the Atlantic exchange, development of the Atlantic plantation complex, and the slave trade. [3] (INT)

HIST 1270W. Sub-Saharan Africa: 1400-1800. Early history; rise of major empires. Cultural history of major groups, the spread of Islam; Indian and Atlantic Ocean trade economies; the slave trade. Repeat credit for HIST 1270. [3] (INT)

HIST 1271W. War, Refugees, and Reconciliatory Justice in Africa. Historical and contemporary conflicts. Border wars, civil wars, genocides, terrorism, political violence, and warlordism in Africa. Displacement and refugees; truth and reconciliation commissions; post-conflict justice; peace processes, post-conflict reconstruction. [3] (INT)

HIST 1280. Africa since 1800: The Revolutionary Years. [Formerly HIST 128] Political, economic, and social patterns in SubSaharan Africa from 1800 to the present. The transition from traditional states and societies, through the colonial interlude and the quest for independence to the modern national setting with its problems of development. Emphasis on the peoples of Nigeria and South Africa. [3] (INT)

HIST 1281W. The Making of African Cities: Histories of Globalization and Migration. Cultural, political, and environmental history of towns from antiquity to the present. Emergence of early city-states. Relationship between urban formations and natural environments. Trade, migration, and religious networks. Colonial rule and urban planning. Nationalist movements. Expressive cultures. Challenges of urbanization. Development, infrastructure, and technology. [3] (INT)

HIST 1345. The World of Rome. Origin of the city to the collapse of the Western empire, particularly from Punic Wars to the Severan emperors. Political, military, social, and religious history. Ancient authors and material culture. Not open to students who have earned credit for CLAS 2150 and 2160 without permission. Total credit for this course, CLAS 2150, and 2160 will not exceed 6 hours. Credit hours reduced from third course taken (or from test or transfer credit) as appropriate. [3] (INT)

HIST 1350. Western Civilization to 1700. [Formerly HIST 135] Judeo-Christian and Greco-Roman foundations to the beginning of the eighteenth century. [3] (INT)

HIST 1352. Law, Trade, and War in European Empires, 1400-1900. Major economic and legal transformations of the early modern world. Strategies of Portuguese, Spanish, Dutch, English, and French overseas empires in Asia, Africa, and the Americas. Role of law, in particular the legal framework for European-indigenous relations and the rise of international law. Imperial economies, especially shifting patterns of trade and labor. Violence against indigenous people and rivalries among imperial powers. [3] (INT)

HIST 1355W. Innovation and Renovation in Renaissance Europe. Renaissance as historical period. Reason versus faith. Materiality. Cultural interactions across political and economic borders. Works by Dante, Petrarch, and Machiavelli. [3] (HCA)

HIST 1360. Western Civilization since 1700. [Formerly HIST 136] European history from the age of the Enlightenment to the present day. [3] (INT)

HIST 1368. Rio de Janeiro: Culture and Citizenship in the Marvelous City. From the nineteenth century to the present. Race, class, and gender. Film and literary sources. Modernity and marginalization. [3] (INT)

HIST 1370. Colonial Latin America. [Formerly HIST 137] Survey of Latin American history from pre-Columbian times to the early nineteenth century. Iberian, Amerindian and African background; the conquest; construction of colonial society and institutions; wars for independence. [3] (INT)

HIST 1378. Social Movements in Latin America, 1780-1912. Citizenship and state formation. Race, gender, and nation. Tupac Amaru insurgency, Brazilian abolitionism, and the first Black political party in Cuba. [3] (P)

HIST 1379W. The Inquisition in the New World: Law, Deviance, and Heresy in Colonial Mexico. Inquisition as a window on colonial law and culture in Mexico. Church, state, and empire. Religious change. Gender, race and ethnicity, and religious practices. Understandings of orthodoxy, heresy, deviance, and cultural practices. [3] (P)

HIST 1380. Modern Latin America. [Formerly HIST 138] A survey of Latin American history from the early nineteenth century to the present. Wars for independence; rise of new nations and export-oriented economies; case studies in revolution, nationalism, and reform in the twentieth century; U.S.-Latin American relations. [3] (INT)

HIST 1383. Slave Resistance in the Americas. Resistance across North and South America. Slave flight, marronage, and full-blown rebellion. Free black towns in Florida, Mexico, Panama, and Colombia created by former

slaves. Problems of evidence and voice through primary sources of free and enslaved Africans and their descendants. Sources by historians and archaeologists. Art and material culture of rebels. Offered on a graded basis only. [3] (INT)

HIST 1385W. Disease and Disorder in the Atlantic World. Spanish Atlantic from Columbus through the Haitian Revolution. Smallpox, slavery, and rebellion. [3] (INT)

HIST 1390. America to 1776: Discovery to Revolution. [Formerly HIST 139] North American colonies from the Iberian Atlantic dominion through the zenith of the British Empire. The impact of the European quest for empire on Native American and West African societies. The emergence of colonial North America within the context of European imperial rivalries and Native American political and economic networks. [3] (US)

HIST 1395. The Underground Railroad. Runaway slaves and their assistance from free blacks, whites, and other slaves. Impact on the course of slavery. Mechanisms of slave holders to capture and return the enslaved. Offered on a graded basis only. [3] (US)

HIST 1400. U.S. 1776-1877: Revolution to Civil War and Reconstruction. [Formerly HIST 140] Independence and establishment of new political institutions. Westward expansion, economic expansion, formation of a distinctive American culture. Development of mass party politics, evangelical Protestantism, and reform movements. Sectional conflict over slavery, Civil War; Reconstruction, and the dawn of the Gilded Age. [3] (US)

HIST 1410. U.S. 1877-1945: Reconstruction through World War II. [Formerly HIST 141] Economic, political, and social history during the era of industrialization, mass immigration, the rise of mass culture, the Great Depression, and the two world wars. [3] (US)

HIST 1420. U.S. Post-1945: Cold War to the Present. [Formerly HIST 142] Political, international, social, and cultural currents that have shaped contemporary America. [3] (US)

HIST 1422W. FDR, the New Deal, and War. 1930s and 1940s United States' domestic and foreign policy during the presidency of Franklin D. Roosevelt. U. S. global ascendancy and rise of the new welfare state. [3] (US)

HIST 1425W. Body, Mind, and Soul: Elvis, Dylan, Springsteen and Postwar America. Rock and roll's transformation of American culture. Focus on three pivotal artists and their role in the history of each of their breakout decades: the 1950s, 1960s, and 1970s. Readings and listenings on the African American roots of rock, the gendered dimensions of the genre, the role of dissent and accommodation in popular music. Issues of youth, alienation, religion, and individuality. [3] (US)

HIST 1427W. The United States in the Seventies. The 1970s as pivotal to cultural, economic, and social change. Vietnam, Watergate, and economics of stagflation. Fundamental changes in race and gender relations. Transformations through and in music, film, and television. U.S. national politics, concluding with an analysis of the causes of the "Reagan Revolution." [3] (US)

HIST 1430W. North American Indians and the Environment. North American Indians' interaction with their environments over time and space. Challenges posed by colonial practices and government policies. American Indian communities' projects in U.S. and Canada to sustain spiritual and material connection to natural world. [3] (US)

HIST 1438. African American History to 1865. Political, cultural, socio-economic, and intellectual history of African Americans from their arrival in colonial America through the end of the U.S. Civil War. History of and resistance to slavery. [3] (US)

HIST 1440. African American History since 1877. [Formerly HIST 144] The political, socioeconomic, and intellectual history of African American people from the end of Reconstruction to the present. Special emphasis on African American cultural and institutional history and the twentieth-century protest movements. [3] (US)

HIST 1469. Introduction to Sports History. Race, gender, and empire. Soccer, baseball, and basketball. U.S. college athletics. Sports and geopolitics. Sports and social issues. [3] (US)

HIST 1470. History of Exploration. [Formerly HIST 147] Antiquity to the present. Voyages of discovery, including land expeditions and exploration of extreme depths, high altitudes, and outer space. Technologies of travel and measurement. Voyaging as exploration of the self. Cultural shifts as consequences of encounters with new places and peoples. [3] (INT)

HIST 1480. The Darwinian Revolution. [Formerly HIST 148] Intellectual structure and social context of evolutionary ideas from 1700 to the present. Pre-Darwinian evolutionary theories. Darwin's life and work. Racial theories and eugenics. Comparative reception of Darwinism in the United States and Europe. Conflict between science and religion. [3] (P)

HIST 1500. History of Modern Sciences and Society. [Formerly HIST 150] The end of the Scientific Revolution to the present. Sciences arising from the fields of Natural Philosophy (physics, astronomy, mathematics, and chemistry) and Natural History (geology and the life sciences). The clockwork universe, atomism and the Chemical Revolution; evolutionary theory (physical, geological, and biological); thermodynamics; and quantum theory. Colonial empires, industry, professional specialization, cultural modernism, and nuclear fear. [3] (P)

HIST 1510. The Scientific Revolution. [Formerly HIST 151] The production and dissemination of knowledge of the natural world during the period of the Scientific Revolution, covering roughly from 1450 to 1700. Cosmology and astrology, navigation, alchemy, religion and philosophy, and medicine. [3] (P)

HIST 1510L. Scientific Revolution Digital History Lab. Optional lab accompanying HIST 1510. Digital history tools and building digital projects. Prerequisite or corequisite: 1510. [1] (No AXLE credit)

HIST 1515. Virtual Reality and the Humanities. Workshop in humanistic dimensions of interactive immersive environments including video games and simulations. History and theory of the medium as well as tools and practices in their creation. [3] (HCA)

HIST 1520. Science and the Sea. Histories of science and environment. Effect of science on our conception of the ocean; effect of working at sea on our practice of science. Navigators' travel journals, oceanographers' reports, and recent writings by historians of ocean science. [3] (P)

HIST 1580. Crime and Punishment in Early Modern Europe 1400-1800. [Formerly HIST 158] Changing definitions of crime, the classification of criminals, and the nature of punishment. "Real" crimes such as vagrancy, theft, and murder; imaginary crimes such as Jewish ritual murder and witchcraft. Connections with long-term social, legal, and cultural transformations. [3] (HCA)

HIST 1582W. Witchcraft, Supernatural Phenomena, and Print Culture in England, 1558-1650. Role of printed broadsides, woodcuts, pamphlets, and treatises in spreading and influencing ideas about the supernatural. Responses to demonic possession, "monstrous" events, and magic. Social, legal, cultural, and religious contexts. Influence of expectations about gender and class. Development of theological and skeptical views. [3] (INT)

HIST 1584W. Foreigners and Citizens: Law and Rights in Modern Europe. French Revolution to late 20th century. Laws, institutions, and debates over citizenship and human rights. Experiences of refuge, migration, assimilation, and ethnic cleansing. Influence of nationalism, communism, liberalism, secularism, and multiculturalism on discourses of civil and human rights. [3] (INT)

HIST 1586W. Nazi Germany, the Holocaust, and Digital Humanities. Local studies of Nazi Germany and the Holocaust using the tools of digital humanities. Map-generation using Arc-GIS and data linking. [3] (INT)

HIST 1600. European Economic History, 1000-1700. [Formerly HIST 160] From the commercial revolution of High Middle Ages to Industrial Revolution. Interconnections of economic forces with politics, society, and cultures. Rise of long distance trade; development of business and accounting techniques; public finance; monetary trends; advent of capitalist ethic. [3] (SBS)

HIST 1640. History of American Capitalism. [Formerly HIST 164] The development of American capitalism from the colonial period to the twenty-first century. The reasons for and effects of capitalist growth; the ways in which a largely agrarian society emerged as an industrial and commercial

leader and shaped the ways Americans produced and lived. The political, social, and cultural dimensions of economic change. The global context of American development. [3] (US)

HIST 1660. American Enterprise. [Formerly HIST 166] Evolution of the form, organization, and structure of the American business firm from colonial times to the present. Entrepreneurs, labor management, financial capital, distribution, invention, and government regulation. [3] (US)

HIST 1665. Capital, Labor, and Democracy in the United States. Nineteenth century to present. Tensions and connections between capitalism and democracy. Basic introduction to the social and political history of workers, business, politics, and organized labor. Questions of power and economic inequality as expressed in American political culture. [3] (US)

HIST 1667. Famous American Trials. Salem witchcraft trials, Aaron Burr's treason trial, Emmett Till murder trial, and O.J. Simpson's murder trial as lenses to examine central themes in American culture, history, and memory. [3] (US)

HIST 1690. Sea Power in History. [Formerly HIST 169] U.S. Navy's role in foreign and defense policies from the American Revolution to the present. Broad principles, concepts, and elements of sea power throughout history. Technological advances, interservice relations, strategies, and governmental policies pertaining to sea power. Designed to meet the NROTC requirement. Offered on a graded basis only. [3] (US)

HIST 1691. Evolution of Warfare. [Formerly HIST 169C] Antiquity to the present. Evolution of strategic principles. Influence of technological, economic, moral, psychological, and political factors. Case studies from a soldier's perspective. Repeat credit for students who have completed NS 2311. [3] (No AXLE credit)

HIST 1693. Fundamentals of Maneuver Warfare. [Replaces HIST 1692 Amphibious Warfare] Broad aspects of warfare and their interactions with maneuver warfare doctrine. Focus on the United States Marine Corps as the premier maneuver warfare fighting institution. Historical influences on current tactical, operational, and strategic implications of maneuver warfare practices. Case studies. Enrollment preference to NROTC students. Repeat credit for students who have completed HIST 1692. [3] (No AXLE credit)

HIST 1699. Militarization in 20th Century American Society. Militarization as shaping 20th century American society. Conscription and citizenship; meanings of national identity; martial masculinities and femininities; impacts of war on racial politics; militarized welfare state; Cold War urbanisms; and militarized policing. [3] (US)

HIST 1700. Western Military History to 1815. [Formerly HIST 170] War in culture, politics, and society; technology, the Military Revolution and state-formation. [3] (INT)

HIST 1710W. Writing for Social Change. Practice of narrative, nonfiction writing for social change. History of American investigative journalism and scholarship. Interviewing, research, narrative and revision skills. [3] (HCA)

HIST 1725W. United States and the Middle East. U.S. involvement in the Middle East with emphasis on the period after 1945. Special attention on the Israeli-Palestinian conflict. Offered on a graded basis only. [3] (US)

HIST 1730. The U.S. and the Cold War. [Formerly HIST 173] U.S. history, 1945-1991. Emphasis on foreign policy and competition with Soviet Union. Impact of Cold War on American society. [3] (US)

HIST 1740. The U.S. and the Vietnam War. [Formerly HIST 174] Origins of American involvement, the reasons for escalation, and the Vietnamese response to intervention. The impact on America's domestic politics, the growth of the anti-war movement, and the economic, social, and cultural effects of the conflict. [3] (US)

HIST 1760. History of Christian Traditions. [Formerly HIST 176] Origins to the present. Jewish origins, formation of a Catholic tradition, church-state relations, and the social and cultural contexts of changing Christian beliefs and practices. [3] (HCA)

HIST 1770. United States' Religious History. Religion's influence on the body politic and culture of society. Readings from several religious communities. How race, gender, and ethnicity shape religious identity. [3] (US)

HIST 1780W. Self and Society in the United States. Selfhood and identity development from the early Republic to the present. The role of race, class, and gender but also religion, politics, work, technology, and media in shaping selves in the United States. Readings include autobiographies, fiction, etiquette manuals, advertisements, and scientific tracts. Offered on a graded basis only. [3] (HCA)

HIST 1882W. Japan Through Historical Fiction. Premodern and modern history of Japan through works of Japanese historical fiction. Culture, religion, and society. Relationship between history and literature. [3] (INT)

HIST 2100. Politics and Catastrophe in Modern China. [Formerly HIST 202] Influence of politics on culture, society, government, and the military. The Cultural Revolution to Tiananmen Square. [3] (INT)

HIST 2102. Introduction to Brazil. A multidisciplinary survey of Brazil from pre-Columbian times to the present, emphasizing culture, economic and political patterns, social issues, literature, and the arts in historical perspective. [3] (INT)

HIST 2105. Chinese Thought. [Formerly HIST 203] Confucianism and Philosophical Daoism. The Confucian Four Books, the Daodejing (Laozi), Zhuangzi, and Neo-Confucianism. [3] (INT)

HIST 2106. A Global History of Tea. Origins in China to its spread around the world. Role of tea in culture and world events, as a driver of commerce, science, and exploration. Links to Buddhism and political power in East Asia. Diverse functions in different cultures. Tea as trade commodity. Manner of preparation and use. [3] (INT)

HIST 2110. Crisis Simulation in East Asia. [Formerly HIST 204] Strategic motivations and behaviors of international actors. Simulations of the decision-making process during critical historical moments in the East Asian context through role-playing and video games. Offered on a graded basis only. [3] (INT)

HIST 2111. China and the United States: Intertwined Histories. Cultural, social, and economic interactions 1700s to the present. Chinese porcelain and tea trade in colonial America; American involvement in opium trade. Chinese students in the United States; American missionaries in China. Military conflicts and alliances. Mutual formation of cultural perceptions and misperceptions. [3] (P)

HIST 2115. Play and Pleasure in Early Modern Japan. [Formerly HIST 205] Cultural history of Tokugawa Japan (1603–1868), with emphasis on daily life and popular entertainment in the capital of the warrior government, Edo (present-day Tokyo). Woodblock prints, pleasure quarters, kabuki theatre, commiseration carnivals, and popular literature. [3] (INT)

HIST 2120. Japan's War and Postwar, 1931–1989. [Formerly HIST 206] Japan's war in Asia and the Pacific in the mid-twentieth century and its legacies. The effect of defeat on the nation; reconstruction efforts and economic success. Hirohito's death. [3] (INT)

HIST 2130. Russia: Old Regime to Revolution. [Formerly HIST 209] Russian history from the early nineteenth-century old regime through the Russian Revolution of 1917. Culture, society, and serfdom; the Great Reforms, ideology, and radicalism; industrialization; modernity in an agrarian society; twentieth-century revolutions. [3] (INT)

HIST 2135. Russia: The U.S.S.R. and Afterward. [Formerly HIST 210] Russian history since the 1917 Revolution. Overview of the old regime; revolution and civil war; the Soviet "Roaring '20s"; Stalinism and the totalitarianized society; World War II. Postwar Soviet society and culture; de-Stalinization and the sixties generation; Gorbachev, perestroika, and disintegration; contemporary history. [3] (INT)

HIST 2137. The Mandelas: Biography, Struggle, and Legacies. [Formerly HIST 211] Personal and political biographies of Nelson and Winnie Mandela. Their childhood, upbringing, education, professional and personal lives. Their legacies and lessons as global human rights icons through the anti-apartheid struggle, arrest, trials, imprisonment, freedom, presidency, and reconciliation. [3] (INT)

HIST 2138. Blood Diamonds, Blood Oil, Commodities, and Conflicts in Africa. 1870s to the present. Role of diamonds, gold, rubber, and oil in the resulting conflicts in modern Africa. Multinationals, mineral extrac-

tion, and politics. Poverty, war, child labor, and corruption. Local and international mining and mineral syndicates. Implications for Africans and their livelihoods. [3] (INT)

HIST 2139. Technology, Nature and Power in Africa. Early modern to present. How politics and technology shape everyday life in Africa and have been shaped by competing groups. Critiques the narrative that Africa lacks technological sophistication. Shifting meanings of technology; Africa's role in global history of technology; forms of technological engagement including guns, radios, roads, nuclear power, and biometrics. [3] (P)

HIST 2140. The Mughal World. [Formerly HIST 211A] Mughal history from 1500–1750. The early modern world and Islamic empires. Akbar and Hindu-Muslim interactions in South Asia. Oriental despotism and the idea of the monarch. Gender and authority. English, Dutch, and Portuguese views. Trade and the decline of Mughal authority. Globalization, the rise of Indian entrepreneurs, and the East India company. [3] (INT)

HIST 2150. India and the Indian Ocean. [Formerly HIST 212A] Cultures along the Indian Ocean coastline from Roman times to 1800, especially South Asia. Coastal societies and politics, Islam, pilgrimage and trade, economic zones, and cultural ties. Pirates, seafarers and merchants; diasporas and genealogies. The entry of European trading companies and debates on trade and empire. [3] (INT)

HIST 2154. Arabia Through the Ages. Environmental, political, social, cultural, and religious history of the Arabian Peninsula. Ancient towns and kingdoms. Bedouins. Spice trade. Pre-Islamic religions; monotheism. Rise of the Wahhabi movement and the development of Salafism. Exploration of remote deserts by European adventurers. Ottoman and British colonialism. Saudi Arabia from its foundation to the oil boom. Globalization. Offered on a graded basis only. [3] (INT)

HIST 2155. Muhammad and Early Islam. [Formerly HIST 213] Early Arabian society, Judaism and Christianity in Arabia; Muhammad and the birth of Islam, the conquests, Islamization, Arabization; Jewish influences in early Islam, the medieval Islamic world. [3] (INT)

HIST 2160. Medicine in Islam. [Formerly HIST 216] Emergence of medicine in the Islamic world. Links with other traditions. Doctors and society; conventional medical practice in hospitals; prophetic medicine; Jewish and Christian doctors in Islam; pharmacology; developments in the nineteenth-century. Not open to students who have earned credit for HIST 1111 Section 21 without permission. Total credit for this course and HIST 1111 Section 21 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (INT)

HIST 2170. Islam and the Crusades. [Formerly HIST 217] Ideology; successes and failures; history and character of Crusader enterprises in the Holy Land and elsewhere. Muslim religious, political, ideological, and social reactions. Islamic culture and the West; relations among Crusaders, Muslims, and Jews. [3] (P)

HIST 2180. Islamic Narratives: Narratives of Islam. History and historiography in Arab Islam. Aims and uses of historical writing in the religious context. Comparison with other pre-modern cultures. Islamic and non-Islamic sources for Islamic history. Examples from the ancient world, early Islam, Middle Ages, and the political entity known as the Islamic State. [3] (HCA)

HIST 2190. Last Empire of Islam. [Formerly HIST 219] The Ottoman "long nineteenth century," 1789 to 1923. The Reforms (Tanzimat), state patriotism, intercommunal relations, national "awakenings," and the emergence of a public sphere. Historiographical issues, such as perceptions of the empire as the "Sick Man of Europe" and debates over its decline. [3] (INT)

HIST 2220. Medieval and Renaissance Italy, 1000–1700. [Formerly HIST 222] Transformation of Italy from "medieval" society to the "Renaissance." Cultural, economic, and social developments, especially connections among wealth, status, and patronage. Meaning and applicability of the term "Renaissance." [3] (HCA)

HIST 2230. Medieval Europe, 1000–1350. [Formerly HIST 223] Economic expansion and the formation of national states; the medieval Church and the revival of learning in the twelfth and thirteenth centuries. [3] (INT)

HIST 2237. Democracy and Dictatorship: Ancient Politics. Politics and political culture between Greece and Rome. Athenian mass democracy and its critics. Hellenistic kingship. Roman Republicanism and transition to emperors. Rhetoric and mass communication. [3] (SBS)

HIST 2238. Crime and Criminal Law in Western Antiquity. Ancient Athens and Rome. Social values and the quest for justice through the legal system. Definition of offenses, procedures, and penalties. Impact of social, economic, and legal status as well as gender. Serves as repeat credit for CLAS 3160. [3] (SBS)

HIST 2239. Sex and the Citizen: Women and the Law in United States. Law's relationship to gender and sexuality from the seventeenth century to the present. Legal categories of gender that have governed the household, the economy, and the political sphere. [3] (US)

HIST 2240. Sex Law. Law concerning marriage, adultery, and homosexuality. Roman, Canon, and Civil Law from Antiquity to the present. [3] (INT)

HIST 2250. Reformation Europe. [Formerly HIST 225] The political, intellectual, and social conditions underlying the Protestant revolt. The Reformation of Luther, Calvin, Zwingli, Loyola, and other religious reformers considered within the context of the general developments of sixteenth-century history. [3] (INT)

HIST 2255. Inventing the Modern Economy: Eighteenth-Century Europe. Economic transformation and the development of Enlightenment political economy in eighteenth-century Europe. New patterns of economic growth and foundations of modern capitalism: colonial commodities and slavery; 'Consumer Revolution'; credit and lending; and industrialization. Political, social, and economic responses by philosophers such as Mandeville, Montesquieu, the physiocrats, and Smith. [3] (INT)

HIST 2260. Revolutionary Europe, 1789-1815. [Formerly HIST 226] Political, cultural, and economic upheavals in the late eighteenth and early nineteenth centuries; the French Revolution and Napoleon, romanticism, and early industrialization. Emphasis on Britain, France, and Germany. [3] (INT)

HIST 2270. Nineteenth-Century Europe. [Formerly HIST 227] Major political, social, economic, and cultural developments from 1815 to 1914. [3] (INT)

HIST 2280. Europe, 1900-1945. [Formerly HIST 228] Political, socio-economic, cultural, and colonial history of Europe from 1914 to the fall of Hitler. [3] (INT)

HIST 2290. Europe since 1945. [Formerly HIST 229] Origins of the Cold War; political and social transformations, East and West; the breakup of colonial empires; ideological and military tensions; intellectual and cultural trends. [3] (INT)

HIST 2293. Muslims in Modern Europe. Eighteenth century to the present. Eastern and Western Europe. Legal, political, and cultural integration and discrimination; questions of secularism and religious freedom; and gender, family law, and democracy. Muslim responses to modernity and formation of global Islamic movements. [3] (HCA)

HIST 2294. Eastern Europe: Critical Encounters. Eastern Europe from Enlightenment to 1989. Nineteenth century imperial competition, birth of nation-states. Minority rights, World War II and the Holocaust, socialist experimentation, police state, and dissent. Revolutions of 1989. [3] (INT)

HIST 2300. Twentieth-Century Germany. [Formerly HIST 230] The turbulent history of Germany, as it went from authoritarian state to volatile democracy, to National Socialist dictatorship, to divided country, and to reunification. Special emphasis placed on the Nazi dictatorship, its origins and legacy. [3] (INT)

HIST 2310. France: Renaissance to Revolution. [Formerly HIST 231] Social and cultural history from 1515 to 1815. Conditions of life, ambitions, ideas, and tastes of the various social groups. Development of arts, music, and literature in a sociopolitical context. Causes and consequences of the French Revolution of 1789. [3] (INT)

HIST 2340. Modern France. [Formerly HIST 234] The fall of Napoleon in 1815 to the present. Emphasis on politics. Major economic, social, cultural, and intellectual developments. [3] (INT)

HIST 2380. Shakespeare's Histories and History. [Formerly HIST 238] Readings from a variety of plays by Shakespeare and his contemporaries. Significant political and cultural issues from the 1590s in early English history. [3] (HCA)

HIST 2382. The Rise of the Tudors. [Formerly HIST 239B] Causes and course of the political crisis in the fifteenth century and the rise of the Tudor monarchy. Political and religious forces that drove the English Reformation and its immediate consequences. Serves as repeat credit for HIST 2385. [3] (HCA)

HIST 2383. A Monarchy Dissolved? From Good Queen Bess to the English Civil War. [Formerly HIST 239C] Creation of political stability out of the turmoil caused by the English Reformation and its dissolution only forty years later. The relationship between religion and politics, state and society. Serves as repeat credit for HIST 3260. [3] (HCA)

HIST 2385. The Real Tudors. [Formerly HIST 239A] Marital, dynastic history of the Tudors in relation to religious and political change through and after the English Reformation. Court politics, ideological conflict, and the rise of an increasingly confessionalized international politics. Offered on a graded basis only. Serves as repeat credit for HIST 2382. [3] (HCA)

HIST 2410. Victorian England. [Formerly HIST 241] Cultural values, liberal reform; urbanization; women and gender; imperialism. [3] (INT)

HIST 2413. Global History of Waste. From nineteenth century to present. Environmental, cultural, economic and labor history of waste. Production, consumption and disposal practices. Environmental injustice and socio-economic inequalities associated with garbage and toxicity. Castaways as historical artifacts. Case studies of urban sewage, plastic and toxic pollutants, electronic waste, landfills, and recycling. Material culture studies and local site visits. Serves as repeat credit for students who have earned credit for HIST 2413W. [3] (P)

HIST 2413W. Global History of Waste. From nineteenth century to present. Environmental, cultural, economic, and labor history of waste. Production, consumption, and disposal practices. Environmental injustice and socio-economic inequalities associated with garbage and toxicity. Castaways as historical artifacts. Case studies of urban sewage, plastic and toxic pollutants, electronic waste, landfills, and recycling. Material culture studies and local site visits. [3] (P)

HIST 2450. Reform, Crisis, and Independence in Latin America, 1700-1820. [Formerly HIST 245] Reorganization of the Spanish and Portuguese empires; maturation of transatlantic societies; and revolutions for independence. [3] (INT)

HIST 2457. Drug Trafficking and Society in Latin America. Narcotics trafficking between Latin America and the United States. Complexities of production, transport, and trade. U.S. drug policy and politics. The "drug war." Violence, social problems, and political issues related to drugs in Latin America. Representation of the drug trade and drug culture. [3] (INT)

HIST 2470. Revolutionary Mexico. [Formerly HIST 247] Revolutionary politics and radical expression in 20th century Mexico. Causes of popular unrest; violent political change; post-conflict state-building; government attempts to alter popular culture; radical muralism and graphic art; revolutionary expression and gender; literature and disenchantment. [3] (INT)

HIST 2480. Central America. [Formerly HIST 248] Iberian and Amerindian background, colonial society; independence; growth of the plantation economy; the U.S. presence; political and social revolutions in the twentieth century. [3] (INT)

HIST 2490. Brazilian Civilization. [Formerly HIST 249] From pre-Columbian times to the present. Clash and fusion of Portuguese, Amerindian, and African cultures; sugar and slavery; coffee and industrialization; race relations; dictatorship and democracy in the twentieth century. [3] (INT)

HIST 2510. Reform and Revolution in Latin America. [Formerly HIST 251] Comparative analysis of revolutions and reform movements in twentieth-century Latin America focusing on land tenure, social classes, political culture, economic structures, and foreign influences. [3] (INT)

HIST 2530. African Religions in Americas. [Formerly HIST 253] An interdisciplinary study of Islam, Christianity, and Animist religions in pre-colonial

Africa; their transformation and practice in the Americas. Case studies of Brazil, Cuba, and the American South. Material culture studies and visits to local museum exhibits. [3] (INT)

HIST 2535. Latin America and the United States. [Formerly HIST 253A] The complicated relationship between Latin America and the United States from the early nineteenth century to the present. Role of ideology, national security, economic interests, and cultural factors in shaping inter-American affairs. [3] (INT)

HIST 2540. Race and Nation in Latin America. [Formerly HIST 254A] Late nineteenth century to the present. Social, political, and cultural constructions of belonging. Citizenship and state building. Immigration, education, urbanization, civil and international wars, and gender and sexuality. Case studies draw from the Andes, Spanish Caribbean, Southern cone, and Brazil. [3] (INT)

HIST 2542. Cuba and the United States. History of Cuba. European conquest, the colonial period, independence, U.S. intervention, the Cuban Revolution, Cold War to present. Special consideration given to the global impact of the Cuban Revolution. [3] (INT)

HIST 2544. Panama: Global Crossroads. Panama, its colonial history, ties to Colombia, French canal project, independence, and United States' control and intervention. Panama Canal and its worldwide significance. [3] (INT)

HIST 2570. Caribbean History, 1492-1983. [Formerly HIST 257] Amerindian society; age of encounter; imperial contest; slavery and abolition. U.S. influence; independence movements; cultural movements; invasion of Grenada. [3] (INT)

HIST 2580. American Indian History before 1850. [Formerly HIST 258] Indian nations' interaction with each other and with European colonies. Resistance and adaptation to colonialism. Early development of United States Indian policy. [3] (US)

HIST 2590. American Indian History since 1850. [Formerly HIST 259] American Indians in the United States and Canada. Their responses to government policies and other forces. Cultural, socioeconomic, and political change among Indian communities. [3] (US)

HIST 2595W. Pirates, Plantations, and Power: The English Atlantic World, 1500-1688. [Formerly HIST 243W] Elizabethan era to Glorious Revolution. Shift from piracy to colonization of Ireland and the Americas. Cross-cultural contact, race formation, economies of empire, and migration. [3] (US)

HIST 2610. The Founding Generation. [Formerly HIST 261] American history from the 1760s to the 1820s. The Revolutionary War, the Constitution, formation of national government. Political conflict, national culture, commerce, diplomacy, and race and gender in an age of revolution. Primarily for Juniors and Seniors. [3] (US)

HIST 2620. The Old South. [Formerly HIST 262] The South's origins in European expansion; the rise of the plantation economy and society, and its identification with slavery; the differing experiences of whites and blacks, planters and nonplanters; the relationship of the region to the larger United States; the Confederate attempt at independence and the collapse of the slave regime. [3] (US)

HIST 2630. The New South. [Formerly HIST 263] The aftermath of war and emancipation and the era of Reconstruction; social change and dislocation in the late nineteenth century; the Populist Revolt; the origins of segregation and one-party politics. Twentieth-century efforts to modernize the region; the economic, political, and Civil Rights revolutions of the mid-twentieth century; the South in modern American society and politics. [3] (US)

HIST 2640. Appalachia. [Formerly HIST 264] The region from first European intrusions to the present. Frontier-era white-indigenous contact, antebellum society and economy, relations with the slave South, the Civil War and postwar politics, increasing social strainings, industrialization and labor conflict, poverty and outmigration. Examination of mountain culture, tourism, and the construction of the "hillbilly" image. [3] (US)

HIST 2650. The U.S. in the Era of the Civil War. [Formerly HIST 265] Sectional conflict, secession, the Southern War for Independence, and Reconstruction; 1850-1877. [3] (US)

HIST 2655. Historic Black Nashville. From settlement through the Civil War. Secondary literature and archival research to identify significant black history sites in Nashville. Not open to students who have earned credit for UNIV 2655. Offered on a graded basis only. [3] (US)

HIST 2658. Law and Society of the Seas, 1400-1900. Maritime cultures and legal conflicts at sea. Lived experiences of sailors and captives. Strategies of states and navies. Violence at sea; piracy and mutinies. Offered on a graded basis only. [3] (INT)

HIST 2660. The Birth of Modern Capitalism and Human Trafficking. [Formerly HIST 266] Closure of the Atlantic slave trade in eighteenth and nineteenth-century Britain and the United States. State formation, the birth of modern human rights discourse, and ideas about compassionate capitalism. [3] (INT)

HIST 2662. Slavery in the United States. History of American slavery, from the formation of a slave power in the seventeenth century to the defeat of the slaveholders' republic in the wake of the Civil War. [3] (US)

HIST 2684. The History of Black Power. Nineteenth to twenty-first centuries. History, impact, and legacies of black power politics broadly, and the Black Power Movement specifically, in the United States and abroad. [3] (HCA)

HIST 2685. Race and U.S. Visual Culture. From the 1700s to the present. Iconic texts, major themes, and transformative figures in the representational history of African Americans. Art and photography as strategies for racial uplift. Intra-racial satire. Black entertainment culture and societal imagery. Issues of gender, class, and sexuality. [3] (P)

HIST 2686. Race, Rights, and the American Dream. Primarily post 1930s to the present. Exploration of the concept of the U.S. "American Dream." Emphasis on race, gender, class, and power dynamics as related to urban space, housing, work, and identity. Inequality, rights, and social action. Offered on a graded basis only. [3] (US)

HIST 2689. "Women of Color": History, Theorizing and Organizing in the United States. Examines the historical roots of the term "Women of Color." Theories, politics, coalitions, and struggles that emerged in the United States from the late 1960s to the present. Offered on a graded basis only. [3] (US)

HIST 2690. The Civil Rights Movement. [Formerly HIST 269] Following two decades of progress from *Brown v. Board of Education* in 1954 toward racial justice and equality in the United States. Leaders, organizations, and milestones. [3] (US)

HIST 2691. Barack Obama: Man and President. Examination of Obama's presidency. Exploration of background influences and their impact in domestic & foreign affairs. [3] (US)

HIST 2692W. Biographies of Struggle. Struggles for social justice. Identity, politics, and protest. Exploration of issues, traditions, and targets. Biography, personal testimonies, and oral life narratives of people engaged in efforts to challenge oppression. [3] (US)

HIST 2700. The U.S. and the World. [Formerly HIST 270] From the winning of independence to the Great Depression. Relationships among foreign policy, ideology, domestic politics, and social and economic change. [3] (US)

HIST 2710. The U.S. as a World Power. [Formerly HIST 271] From the origins of World War II, through the Cold War, to the present day. Relationships among foreign policy ideology, domestic politics, and social economic change. [3] (US)

HIST 2720. World War II. [Formerly HIST 172] Origins and causes of the global conflict; the six years of military campaigns; politics and diplomacy of war-making; race as a factor shaping the war in Europe and Asia. Impact of technological innovations; social and economic aspects of the struggle, as well as its moral and psychological implications. [3] (INT)

HIST 2721. Globalizing American History, 1870-1940. [Formerly HIST 272A] Immigration; diasporic social movements; transnational social reform campaigns; military, colonial, and corporate empire-building; expansion of missionary activity; United States' participation in World War I. [3] (US)

HIST 2722. Globalizing American History, 1940-2010. [Formerly HIST 272B] The rise of U.S. world power after 1940 and the transformation of American society through its global interactions. Impact of transnational mobility and communications, connected social movements, war and militarization, and mass immigration. [3] (US)

HIST 2725. Race, Power, and Modernity. [Formerly HIST 272C] Historical approaches to race as a modern system of power and difference. The United States experience in comparative and transnational perspective. Race as an historical and socially-constructed ideological system. Race intersecting with nationality, region, class and gender. Race in the making of space, citizenship, and economic institutions. [3] (US)

HIST 2730. American Masculinities. [Formerly HIST 272D] Changing definitions of manhood and masculinity from the colonial period to the post-9/11 era. The rise of democratic politics, industrialization, slavery and emancipation, feminist politics, and the growth of the global power of the United States. [3] (US)

HIST 2735. Debating America in the World, 1890-2010. [Formerly HIST 272E] Debates about the U.S. role in shaping the twentieth century. War; colonialism and anti-colonialism; immigration; participation in international institutions. [3] (US)

HIST 2740. Immigration, the United States, and the World. Mid-nineteenth century to present. Relationship between U.S. immigration policy and politics; international relations. Impacts of war, diplomacy, and international pressure on U.S. immigration policy. [3] (US)

HIST 2749. American Thought to 1865. U.S. intellectual tradition from the colonial era to the Civil War. Popular thinkers and elite intellectuals including John Winthrop, Thomas Jefferson, Frederick Douglass, and Abraham Lincoln. Race, slavery, nation, and gender. Intellectual movements ranging from abolitionism to Social Darwinism. [3] (US)

HIST 2750. American Intellectual History since 1865. [Formerly HIST 275A] Modern U.S. social thought. Debates over progress, science, nationalism, race, and economy. Ideas in their cultural context. Popular as well as elite thinkers. [3] (HCA)

HIST 2752. African American Intellectual History Since 1776. From the American Revolution to the present. Phillis Wheatley, Frederick Douglass, W.E.B. Du Bois, Amy Jacques Garvey, and Barack Obama. Black abolitionism, Pan-Africanism, black internationalism, Marxism, and black feminism. [3] (US)

HIST 2760. The Historian and the Law. Contemporary legal history and the role of law in shaping historical research. Doctrinal history, legal culture, colonial encounters, and crime and violence. Formal versus informal modes of state and community control and sanction. Serves as repeat credit for students who have earned credit for HIST 2760W. [3] (SBS)

HIST 2760W. The Historian and the Law. Contemporary legal history and the role of law in shaping historical research. Doctrinal history, legal culture, colonial encounters, and crime and violence. Formal versus informal modes of state and community control and sanction. Serves as repeat credit for students who have earned credit for HIST 2760. [3] (SBS)

HIST 2780. Superhuman Civilization. [Formerly HIST 153] Trends in human biological enhancement through the re-engineering of basic physical and mental traits. Debates over transhumanism, designer babies, neuroethics, and technological determinism. Long-term implications for social justice and human identity. [3] (P)

HIST 2800. Modern Medicine. [Formerly HIST 280] Scientific, social, and cultural factors influencing the rise of modern medicine. Europe and the U.S., 1750 to the present. [3] (P)

HIST 2810. Women, Health, and Sexuality. [Formerly HIST 281] Women as patients and healers in the U.S. from 1750 to the present. Topics include women's diseases and treatments; medical constructions of gender,

sexuality; childbirth, birth control, abortion; midwives, nurses, and doctors. [3] (US)

HIST 2835. Sexuality and Gender in the Western Tradition to 1700. [Formerly HIST 183] Politics, war, and masculinity; Christianity and sexuality; changing ideas about gender roles and sexual practices. [3] (P)

HIST 2840. Sexuality and Gender in the Western Tradition since 1700. [Formerly HIST 184] Modern masculinity, femininity, and gender roles; origins of identity politics and changing sexual norms; contemporary feminist issues. [3] (P)

HIST 2845. Race, Gender, and Slave Emancipation. Comparative and Atlantic world history. Haiti, United States, Caribbean, Brazil, and South Africa. Novels, plays, and slave narratives. Slavery and post-emancipation. [3] (INT)

HIST 2855. Women and Gender in the U.S. to 1865. [Formerly HIST 185] Social and cultural history of gender, race, and sexuality as represented in literary, legal and artistic texts. Exploration of Native American conquest, captivity narratives, abolitionism and sentimental fiction, nationalism and gender ideas. [3] (US)

HIST 2860. Women and Gender in the U.S. since 1865. [Formerly HIST 186] Social and cultural history of the intertwined ideas and practices of gender, race, and sexuality. Exploration of experiences, representations, and activism in feminist and gay rights movements, interracial unions, marriage and the family, black women's activism, suffrage, and sexual revolutions. [3] (US)

HIST 3000W. The History Workshop. [Formerly HIST 200W] Introduction to the "historian's craft." Reconstructing the past using primary documents such as diaries, letters, memoirs, and declassified government papers. Methods of historical research and reasoning through individual projects. Offered on a graded basis only. [3] (SBS)

HIST 3010. Pornography and Prostitution in History. [Formerly HIST 187] Commercialization of the sex trade, Renaissance to the present. Political scandal, capitalism, and globalization; effects of technological change, from the printing press to the Internet. Readings from anthropology, psychology, and feminist theory. [3] (P)

HIST 3040. Health and the African American Experience. [Formerly HIST 284B] Disparities in the health care of African Americans, the training of black professionals, and the role of black medical institutions. The intersection between black civic involvement and health care delivery; the disproportionate impact of disease and epidemics within the African American population. [3] (US)

HIST 3045W. Eugenics in the U.S., 1865-present. [Formerly HIST 284D] Comparative perspective. Compulsory sterilization, restrictive immigration acts, "fitter family" contests, medical genetics, and eugenic counseling. Ideas and practices shaped by attitudes toward race, gender, class, and disability. [3] (US)

HIST 3050. Innovation. [Formerly HIST 285C] Origin, reception, and cultural impact of technological innovation. New technologies from the mid-nineteenth century through present-day Silicon Valley and their technical, social, economic, and political dimensions. [3] (P)

HIST 3070W. Science, Technology, and Modernity. [Formerly HIST 285W] Social, cultural, intellectual, and artistic responses to the challenges posed by modern science and technology from the mid-nineteenth to the mid-twentieth centuries. Offered on a graded basis only. [3] (P)

HIST 3090. Tokyo: History and Image. [Formerly HIST 286C] Tokyo and its representation in various media from the mid-nineteenth century to the present and imaginings of the future. The city's physical development and image in photographs, films, novels, essays, and other textual and visual materials produced within Japan and beyond. [3] (INT)

HIST 3100. Pirates of the Caribbean. [Formerly HIST 286D] Imperial competition for control of the Caribbean and state-sponsored piracy. The economic and political consequences of piracy in the Caribbean. The life of pirates aboard ship and in port. [3] (INT)

HIST 3112. China and the World. China's role in global currents since the seventeenth century. China as engine of early-modern global trade. The

Chinese diaspora's transnational impact. Cosmopolitan semi-colonial cities (such as Shanghai) as incubators of global modernity. China as an innovator and exporter of cultural "goods" in the twentieth century, from revolution to modes of health and healing. [3] (INT)

HIST 3112W. China and the World. China's role in global currents since the seventeenth century. China as engine of early-modern global trade. The Chinese diaspora's transnational impact. Cosmopolitan semi-colonial cities (such as Shanghai) as incubators of global modernity. China as an innovator and exporter of cultural "goods" in the twentieth century, from revolution to medicine. Offered on a graded basis only. Repeat credit for students who have earned credit for HIST 3112. [3] (INT)

HIST 3120. Weimar Germany: Modernism and Modernity, 1918-1933. [Formerly HIST 286G] Culture and politics. Mass politics, mass media, economic crisis, and social tensions. Architecture, film, theater, painting, and philosophy. Serves as repeat credit for students who have earned credit for 3120W. [3] (HCA)

HIST 3120W. Weimar Germany: Modernism and Modernity, 1918-1933. Politics and culture. Mass media, economic crisis, and social tensions. Architecture, film, theater, painting, and philosophy. Serves as repeat credit for students who have earned credit for 3120. [3] (HCA)

HIST 3140. History of New Orleans. [Formerly HIST 287B] The city since its founding. Interactions between urban society and natural environment; historical and cultural significance of New Orleans in light of post-Katrina disaster and reconstruction. [3] (US)

HIST 3150. Cities of Europe and the Middle East. [Formerly HIST 287C] Cities of "East" and "West" in the modern period; distinguishing characteristics and shared patterns of urban modernity across different geographies. Conceptions of the European, Middle Eastern, and Islamic metropolis. [3] (INT)

HIST 3170. The Federalist Papers. [Formerly HIST 287E] Classic works on American constitutionalism and government and their views on human nature and republicanism. The framers' rejection of democracy and fear of legislative abuses. The Constitution's emphasis on institutional protections for liberty and checking abuses of power. [3] (US)

HIST 3180. Making of Modern Paris. [Formerly HIST 287G] The social and cultural history of Paris from the old regime to the present. Paris versus the French provinces; revolutionary upheavals; challenges of rapid urbanization. Paris as a literary, artistic, and consumer capital; its changing physical landscape. Immigration and the globalization of Paris. [3] (INT)

HIST 3190. Religion, Culture, and Commerce: The World Economy in Historical Perspective. [Formerly HIST 288A] Cross-cultural trade in a broad chronological and geographical framework. Pre-modern and modern times, western and non-western locales. The role of religion in economic exchange and the movement of commodities. Offered on a graded basis only. [3] (HCA)

HIST 3200. Poverty, Economy, and Society in Sub-Saharan Africa. [Formerly HIST 288B] History of poverty from pre-colonial times to the present. The evolution of economic systems and trading; impacts of transoceanic slave, commodity trading, and colonialism on Africans' standards of living; contemporary African economic challenges of underdevelopment, debt, foreign aid, fair trade, and globalization. [3] (INT)

HIST 3209. Sex, Marriage, and the Body in Islamic Law. Islamic laws related to gender from the seventh century to the present. Qur'an and the Hadith on veiling, marriage, adultery, and men's and women's dress. Differences between Sunni and Shi'ite inheritance codes. Medieval jurists' understanding of reproduction and pregnancy. Modern developments, ranging from the movement for equal voting rights to new technologies such as ultrasounds. Offered on a graded basis only. [3] (P)

HIST 3210. Muslims, Christians, and Jews in Medieval Spain. [Formerly HIST 288C] Coexistence and conflict from 711 to 1492. The blend of cultures, languages, religions, and societies under both Christian and Islamic rule. Offered on a graded basis only. Not open to students who have earned credit for JS 1111 Section 01 without permission. Total credit for this course and JS 1111 Section 01 will not exceed 3 credit hours. Credit

hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (INT)

HIST 3220W. Images of India. [Formerly HIST 288D] Images in and of South Asia as studied through maps, religious imagery, print culture, cinema, and architecture. The politics of visual stereotypes of India. The visual history of Orientalism, modernity, gender, and religion in South Asia. [3] (INT)

HIST 3230. The Art of Empire. [Formerly HIST 288E] Visual media in the establishment of modern empires, with emphasis on Western Europe. Image-making and power; art in cultural exchange and the definition of race, ethnicity, and gender. [3] (HCA)

HIST 3240W. Culture of the Sixties in Europe and the U.S. [Formerly HIST 288G] Youth, rock 'n roll, sexual attitudes, black power, counter-culture, and conservative reaction. Cultural revolution or myth. [3] (INT)

HIST 3260. Revolutionary England, 1603-1710. [Formerly HIST 289A] Causes, nature, and consequences of the English Revolution and the Glorious Revolution. Religious struggle, the fiscal-military state; political thought; parliament and party politics. The Stuart dynasty; the English Republic; court culture and civil war. Serves as repeat credit for HIST 2383. [3] (HCA)

HIST 3270. Religion and the Occult in Early Modern Europe. [Formerly HIST 289D] Popular and learned ideas about religion and the supernatural within the context of the religious reforms of the sixteenth century. Alchemical and astrological practices to ghosts, werewolves, fairies, and other supernatural beings. The witch craze phenomenon of 1560-1650. Offered on a graded basis only. [3] (HCA)

HIST 3275. Religion and Popular Culture in Nineteenth-Century Europe. [Formerly HIST 289E] Popular religious beliefs and practices in their social, cultural, political, and gender contexts. Concentration on Britain, France, and Germany. Offered on a graded basis only. [3] (SBS)

HIST 3280. Popular Cultures in Modern Latin America. [Formerly HIST 290A] 1800 to the present. Music, theater, literature, art, dance, and religion. Cultural performance among popular groups and their attempts to construct, control, and commercialize expression. [3] (INT)

HIST 3746. Workshop in English and History. [Formerly HIST 291] (Also listed as English 3746) Team-taught by a historian and an interdisciplinary scholar. Explores intersection of disciplines through close examination of texts in historical context. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Preference to students majoring in the English-History program. [3] (No AXLE credit)

HIST 3850. Independent Study. [Formerly HIST 296] A program of reading in one field of history to be selected in consultation with an adviser. Normally limited to qualified majors in history. Approval of faculty adviser and director of undergraduate studies required. May be repeated for credit once if there is no duplication in topic and not twice from the same instructor, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits for all semesters of HIST 3850] (No AXLE credit)

HIST 3880. Internship Training. [Formerly HIST 293A] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs. In some cases, such as historical societies or museums, history is a central part of the organization's missions; in other cases, the student will play a role in managing the institution's records or writing its history. Two options are available. (1) full-time: 12-15 hours total, including 6-9 hours in 3880, 3 hours in 3881, and 3 hours in 3882. (2) Part-time: 6-9 hours total, including 3-6 hours in 3880 and 3 hours in either 3881 or 3882. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in history; they must submit a specific plan for the internship to the director of undergraduate studies. After completing the internship, all students must write a thorough report. Must be taken Pass/Fail and concurrently with 3881 and/or 3882. These hours may not be included in the minimum hours required for the history major. Corequisite: 3881 and/or 3882. [3-9] (No AXLE credit)

HIST 3882. Internship Readings. [Formerly HIST 293C] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs. In some

cases, such as historical societies or museums, history is a central part of the organization's missions; in other cases, the student will play a role in managing the institution's records or writing its history. Two options are available. (1) full-time: 12-15 hours total, including 6-9 hours in 3880, 3 hours in 3881, and 3 hours in 3882. (2) Part-time: 6-9 hours total, including 3-6 hours in 3880 and 3 hours in either 3881 or 3882. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in history; they must submit a specific plan for the internship to the director of undergraduate studies. After completing the internship, all students must write a thorough report. Readings and a substantial interpretive essay on topics related to the internship training, under the supervision of a member of the Vanderbilt Department of History. Corequisite: 3880. [3] (No AXLE credit)

HIST 3883. Internship Research. [Formerly HIST 293B] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs. In some cases, such as historical societies or museums, history is a central part of the organization's missions; in other cases, the student will play a role in managing the institution's records or writing its history. Two options are available. (1) full-time: 12-15 hours total, including 6-9 hours in 3880, 3 hours in 3882, and 3 hours in 3883. (2) Part-time: 6-9 hours total, including 3-6 hours in 3880 and 3 hours in either 3882 or 3883. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in history; they must submit a specific plan for the internship to the director of undergraduate studies. After completing the internship, all students must write a thorough report. Students will write a substantial research paper under the supervision of a member of the Vanderbilt Department of History. Corequisite: 3880. [3] (No AXLE credit)

HIST 3890. Selected Topics in History. [Formerly HIST 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

HIST 3980. Junior Honors Seminar in History. [Formerly HIST 297] The first semester of a three-semester sequence of honors study leading to the writing of an honors thesis in history. Introduction to historical thinking, research, and writing. Readings from the major fields of historical scholarship, representing the United States, Europe, Latin America, and Asia. Open to juniors beginning honors work in history, or to qualified history majors with the approval of the director of undergraduate studies. [3] (No AXLE credit)

HIST 4960. Majors Seminar. [Formerly HIST 295] Advanced reading, research, and writing. Topics vary. Offered on a graded basis only. Limited to juniors and seniors and intended primarily for history majors. Prerequisite: 3000W. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 6 credits total for all semesters of HIST 4960] (No AXLE credit)

HIST 4980. Senior Honors Research Seminar. [Formerly HIST 298A] Presentation and discussion of drafts and chapters of honors theses in progress. Offered on a graded basis only. Open only to senior departmental honors students. [3] (No AXLE credit)

HIST 4981. Senior Honors Research Seminar. [Formerly HIST 298B] Continuation of 4980. Offered on a graded basis only. Open only to seniors in the departmental honors program. Prerequisite: 4980. Corequisite: 4999. [3] (No AXLE credit)

HIST 4999. Senior Honors Thesis. [Formerly HIST 299] Writing an honors thesis under the supervision of a thesis adviser and the Director of Honors. Open only to seniors in the departmental honors program. Offered on a graded basis only. Prerequisite: 4980. Corequisite 4981. [3] (No AXLE credit)

History of Art

HART 1001. Commons iSeminar. [Formerly HART 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

HART 1100. History of Western Art: Ancient to Medieval. [Formerly HART 110] Visual and material culture of Europe and the Ancient Near East

from the Paleolithic through the late Medieval period. Egypt, Greece, and Rome; early Christianity and Islam. Form, content, and meaning of works of art and architecture in their cultural context. [3] (HCA)

HART 1105. History of Western Art: Renaissance to Modern. [Formerly HART 111] Major artistic movements from the Renaissance to the Modern era and the developments in painting, sculpture, and architecture. Works of specific artists and cultural factors that affect the visual arts from production to reception. [3] (HCA)

HART 1111. First-Year Writing Seminar. [Formerly HART 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

HART 1120. History of Western Architecture. [Formerly HART 112] Architecture in Europe, Western Asia, and North America from the early first millennium BCE to the present. Form and function; historical, social, and spatial contexts; architects and patrons. Not open to students who have earned credit for HART 1121 without permission. Total credit for this course and HART 1121 will not exceed 5 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 1121. History of Western Architecture I. [Formerly 112A] From prehistoric Europe and Western Asia to Renaissance Italy and the Ottoman Golden Age. Form and function; historical, social, spatial contexts; architects and patrons. Not open to students who have earned credit for HART 1120 without permission. Total credit for this course and HART 1120 will not exceed 5 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 1200. Arts of East Asia. [Formerly HART 120] A survey of sculpture, painting, and architecture in China, Japan, and Korea. Historical, religious, philosophical, and cultural background. [3] (INT)

HART 1205. Arts of South and Southeast Asia. [Formerly HART 125] Second millennium BCE to present. Formation of political and social identities as reflected in artistic productions. Development of artistic traditions in response to cultural exchange and political dynamics. [3] (INT)

HART 1210W. Art and Ritual in Asia. From prehistory to the present. Social and religious functions of the arts of China, India, Japan, Korea, and Himalayas. Select examples explored in museum visits, lectures, discussions, and varied writing projects. [3] (INT)

HART 1220. History of Asian Architecture. [Formerly HART 122] Cultural traditions of Asia from the first millennium BCE to the nineteenth century through the study of architecture. Cities, temples, and domestic structures of China, Japan, Korea, South Asia (India and Pakistan), and Southeast Asia. [3] (INT)

HART 1285W. Introduction to Medieval Art. From the third to fifteenth century; Late Antique period to Late Gothic period. Architecture, sculpture, painting, and the minor arts of Western Europe in historical context, including Byzantine and Islamic art. Not open to students who have earned credit for HART 2285 without permission. Total credit for this course and HART 2285 will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (INT)

HART 1300. Monuments and Masterpieces. [Formerly HART 130] The social and cultural history of the world in fourteen great works, including the Athenian Parthenon, the Pantheon in Rome, the Konjikido in Japan, Michelangelo's Sistine Chapel, and the U.S. Capitol. Sculpture, painting, architecture, and the decorative arts. [3] (INT)

HART 1330W. Heaven on Earth: Sacred Sites in World History. From prehistory to the 19th century. Great works of world religious architecture in their social and cultural context. Monuments, temples, tombs, shrines, and other sacred sites. Cross-cultural and trans-historical comparative perspective. How formal attributes of space and architecture shape religious experience and meaning. [3] (SBS)

HART 1400. U.S. Icons and Monuments. [Formerly HART 140] From 1776 to present. How and why images of people, historical events, and

symbols are revered. Implications for national identity, historical memory, consumerism, and political ideologies. The U.S. Capitol, Statue of Liberty, Mount Rushmore, Marilyn Monroe, and Michael Jordan. Not open to students who have earned credit for HART 1111 Section 13 without permission. Total credit for this course and HART 1111 Section 13 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (US)

HART 1500W. Impressionism. Painting style developed by Monet, Renoir, Pissarro, Cassatt, Morisot, and others, with emphasis on changing atmospheric effects. Work of the French Impressionists from formal, social, political, and intellectual perspectives. Impact of French Impressionism across Europe and North America. [3] (HCA)

HART 1740W. Introduction to Design Studies. Strategies for understanding the reciprocal relationship between design and human experience. Historical and contemporary examples in fields including fashion, climate change, violence, activism, and public health. Social control, nationalism, history and memory, and othering practices. [3] (HCA)

HART 1750W. African American Arts. Blackness and black culture as subject and context for African American visual arts from the 20th and 21st centuries. Emphasis on arts derived from African American cultural perspectives. Not open to students who have earned credit for HART 2750 without permission. Total credit for this course and HART 2750 will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (P)

HART 2100. Architecture and the Mapping of Empire in Asia. Use of architecture to express and delimit empire in Asia from the 3rd century BCE through the 20th century CE. Cosmology in the construction of cities, temples, and tombs. Physical manifestations of divine kingship and royal divinities. Appropriation of ancient models to enhance legitimacy. Architecture as an expression of ethnic/state identities. [3] (P)

HART 2110. Arts of China. [Formerly HART 252] Artistic production from the Neolithic period through the Qing dynasty in relation to religious and cultural contexts. [3] (HCA)

HART 2120. Arts of Korea. History of Korean art and visual culture from ancient times to the present. Intersections of art, literature, religion, and politics, and cultural interactions with China and Japan. [3] (INT)

HART 2130. Arts of Japan. [Formerly HART 253] Artistic production from the Neolithic through Meiji periods in relation to religious and cultural contexts. [3] (HCA)

HART 2150. East Asian Architecture and Gardens. [Formerly HART 251] East Asian religious, vernacular, and garden architecture from the second century CE to the present. Influence of Buddhism on East Asian architecture, fengshui, and site selection, garden as religious landscape, Asia in modern architecture. [3] (HCA)

HART 2170. Religion and politics in South and Southeast Asian Art. [Formerly HART 246] Use of Buddhist, Hindu, and Jain images as political communication in South and Southeast Asia from the time of Buddha (480-400 BC) to the present. The original patronage of temples and religious icons, and their reappropriation in ancient and modern times. [3] (INT)

HART 2175. Modern and Contemporary Indian Architecture. From nineteenth-century British colonial rule to the present. Built environment of Indian subcontinent in local and global contexts. Eighteenth-century Jaipur and urban planning, the British Raj, Calcutta, Allahabad, and Edwin Lutyens' New Delhi. Le Corbusier, Louis Kahn, the Neo-Gothic of Bombay, and contemporary architecture. [3] (INT)

HART 2180. Islamic Art and Architecture. [Formerly HART 244] Visual and building traditions from the seventh through twentieth centuries. Cultural, sacred, political, and historical forces shaping art from Islamic Spain and Turkey to Iran and India. Dome of the Rock, the Alhambra, the Sulaymaniye mosque, Persian illustrated manuscripts, and the Taj Mahal. [3] (INT)

HART 2192. Modern and Contemporary African Art. 1940 to present. Painting, sculpture, photography, performance and film examined in relationship to political, cultural, historical, and aesthetic contexts on and off the African continent. Tradition, colonialism and post-colonialism, diaspora,

nationalism, and gender. Issues regarding collecting, exhibiting, and selling contemporary African art. [3] (INT)

HART 2210. Art and Architecture of Ancient Egypt. [Formerly HART 268] Art, architecture, and culture of Egypt from the fourth millennium through the Old, Middle, and New Kingdoms. Sculpture, wall painting, architecture, and material culture. [3] (HCA)

HART 2220. Greek Art and Architecture. [Formerly HART 255] The Bronze Age, including the Minoans and Mycenaeans, through the Hellenistic period. The social and cultural contexts of material and visual culture. Vase-painting, sculpture, architecture, and more utilitarian artifacts. [3] (HCA)

HART 2260. The Art of Pagans, Christians, and Jews. [Formerly HART 207] Religious art of the Roman Empire in late antiquity. Visual art reflecting religious beliefs and practices. Greco-Roman cults, early Christianity, and Rabbinical Judaism. [3] (HCA)

HART 2270. Early Christian and Byzantine Art. [Formerly HART 210] The development of architecture, sculpture, painting, and the minor arts from the third through eleventh centuries. [3] (HCA)

HART 2275. The Cross and the Crescent: Byzantine-Islamic Confluences in Art. Developments at the interface of Byzantium and early Muslim empires, ca. 500-1000 C.E. Cross-cultural processes shaping visual sensibilities. Doctrinal issues and iconism mirrored in architecture, ornament, mosaics, illuminated manuscripts, coinage. Exemplary sites: San Vitale in Ravenna, Hagia Sophia in Istanbul, Dome of the Rock in Jerusalem, and the Umayyad mosque in Damascus. [3] (INT)

HART 2285. Medieval Art. [Formerly HART 211] The development of architecture, sculpture, painting, and the minor arts in Europe from the eleventh through the fifteenth centuries. Not open to students who have earned credit for HART 1285W without permission. Total credit for this course and HART 1285W will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 2288. Art of the Book. Material and visual composition of medieval manuscripts; working with medieval and contemporary artists' books in Vanderbilt's Special Collections. Audience, changing popularity of texts and illustrations, and concerns of patrons and artists. Exemplary works include the "Book of Kells," "Luttrell Psalter," and "Tres Riches Heures." Offered on a graded basis only. [3] (HCA)

HART 2290. Gothic Paris. From the twelfth to the fifteenth century. Architecture, sculpture, painting, and the luxury arts. [3] (INT)

HART 2310. Italian Art to 1500. [Formerly HART 218] Early development of art and architecture primarily in central Italy from the late thirteenth through the fifteenth centuries. The works of Giotto, Duccio, Donatello, Masaccio, and Botticelli. The age of the Medici in Florence. Not open to students who have earned credit for HART 3320 or 3320W without permission. Total credit for this course and HART 3320 or 3320W will not exceed 4 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 2320W. The Italian Renaissance Workshop. Development of artists' shops, 14th into 16th century. Organization and production. Painting and sculpture techniques. Role of artists in society. Fra'Angelico, Andrea del Verrocchio and the young Leonardo da Vinci, and Sandro Botticelli. Firsthand study of works in the Kress Collection at Vanderbilt. Offered on a graded basis only. Not open to students who have earned credit for HART 3320W without permission. Total credit for this course and 3320W will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 2325. Great Masters of the Italian Renaissance. From the late Gothic to the High Renaissance. Landmarks in painting, sculpture, and architecture in central Italy. Trecento Siennese masters; Giotto, Donatello, Botticelli, and Leonardo in Florence; and Michelangelo and Raffaello in Rome. Tempera and fresco technique; civic, ecclesiastic, and domestic buildings; and stylistic progression. [3] (INT)

HART 2330. Italian Renaissance Art after 1500. [Formerly HART 219] High Renaissance and Mannerist art in sixteenth-century Italy, considering Florentine masters such as Leonardo, Michelangelo, and Pontormo, the

Roman school of Raphael, and the Venetians from Giorgione and Titian to Tintoretto. [3] (HCA)

HART 2340W. The Art of Venice. Renaissance art in Venice and the Veneto during the 15th and 16th centuries. The Golden Age. Painters Bellini, Mantegna, Giorgione, Titian, Tintoretto; architecture of Palladio. Stylistic progression and the development of oil painting. The altarpiece, religious and mythological narrative, and role of portraiture. Context and meaning, civic, state, and ecclesiastical patronage, and consideration of audience. Offered on a graded basis only. [3] (HCA)

HART 2360. Northern Renaissance Art. [Formerly HART 212] Painting, sculpture, and graphic arts in the Low Countries, France, and Germany from the end of the fourteenth century through the Reformation. Historical, social, religious, and stylistic factors. Not open to students who have earned credit for HART 2362 or 3366 without permission. Total credit for this course and HART 2362 will not exceed 4 credit hours. Total credit for this course and HART 3366 will not exceed 5 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 2362. Fifteenth-Century Northern European Art. [Formerly HART 214] Painting, sculpture, prints, and court art in the Low Countries, France, and Germany. Historical, social, economic, religious, and technical analysis. Jan van Eyck, Rogier van der Weyden, and Hieronymus Bosch. Not open to students who have earned credit for HART 2360 without permission. Total credit for this course and 2360 will not exceed 4 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (HCA)

HART 2390. Seventeenth-Century Art. [Formerly HART 221] European painting, sculpture, architecture, and graphic arts. Caravaggio, Bernini, Velazquez, Rubens, and Rembrandt. [3] (HCA)

HART 2600. Eighteenth-Century Art. [Formerly HART 224] The history of European painting, sculpture, and printmaking from the Late Baroque era to the rise of Neoclassicism (1675-1775). Geographical focus on Italy and France. Artists include Maratti, Rusconi, Carriera, Tiepolo, Watteau, Chardin, Fragonard, and others. [3] (HCA)

HART 2620. Nineteenth-Century European Art. [Formerly HART 230] French Revolution to the early twentieth century. International context for artistic movements. The rise of abstraction and the relationship between art, politics, and social change. [3] (INT)

HART 2622. Neoclassicism and Romanticism. [Formerly HART 226] A survey of major artists and monuments of visual culture considered in their political, social, economic, spiritual, and aesthetic contexts from 1760 to 1840. [3] (HCA)

HART 2625. French Art in the Age of Impressionism. French painting, sculpture, and drawing in its social, political, aesthetic, academic, and spiritual context from 1848 to 1886. The Social Realism of Daumier and Courbet; Manet and Aesthetic Realism; Monet, Renoir, Pissarro, Degas, Morisot, and Impressionism; and the rise of Neo- and Post-Impressionism with Seurat and van Gogh. [3] (INT)

HART 2650. Nineteenth-Century Architecture: Theory and Practice. [Formerly HART 229] European and North American architecture from the French Revolution to the First World War. The relationships among architecture and technology, political regimes, social formations, and conceptions of history. Neoclassicism, Gothic Revival, Second Empire, the Arts-and-Crafts Movement, and Commercial Architecture. [3] (HCA)

HART 2660. American Art to 1865. [Formerly HART 240] Painting and sculpture of the United States from Colonial times to 1865 with an emphasis on iconography, social history, race, and gender. [3] (US)

HART 2665. The Vanderbilts as Patrons: Taste-Makers of Gilded-Age Art and Architecture. The Vanderbilts' roles as patrons and tastemakers in translation of European architectural and artistic styles to the United States. Famed Vanderbilt estates such as Biltmore in Asheville, North Carolina, and the Breakers in Newport, Rhode Island. [3] (HCA)

HART 2680. British Art: Tudor to Victorian. [Formerly HART 222] Art and visual culture in the British Isles from the reign of Henry VIII in the sixteenth century to Queen Victoria and the rise of the pre-Raphaelites in the

nineteenth century. Portraiture and landscape painting, relationship between art and empire, rise of the Royal Academy, and patterns of patronage. Holbein, Hogarth, Gainsborough, Reynolds, Lawrence, and Turner. [3] (HCA)

HART 2708. Twentieth-Century British Art. [Formerly HART 223] Painting, sculpture, installation, film and video, and performance in the context of national culture and political history. [3] (HCA)

HART 2710. Twentieth-Century European Art. [Formerly HART 231] Painting, sculpture, and architecture; stressing a social-historical approach to the study of style. [3] (HCA)

HART 2720. Modern Architecture. [Formerly HART 232] A survey of nineteenth-century styles from Federal to Victorian, and major twentieth-century architects and designers from Wright and the Bauhaus to Eames and Kahn. City planning and preservation. [3] (HCA)

HART 2722. Modern Art and Architecture in Paris. [Formerly HART 235] Painting, sculpture, photography, and architecture. Maymester course; first two weeks at Vanderbilt, last two weeks in Paris. [3] (HCA)

HART 2740. Modern Design. From 1850 to present. How thinkers shaped practice. Relationships among modernity, modernism, and design. Historical debates over utopia, gender, social reform, inequality, and aura. Role in world's fairs, empire, fashion, international politics, domesticity. Close study of design exhibitions. [3] (HCA)

HART 2750. African American Art. [Formerly HART 239] Colonial Era to the present. Artwork and artists in their political, cultural, social, historical, and aesthetic contexts. Relationship between race and representation. Not open to students who have earned credit for HART 1750W without permission. Total credit for this course and HART 1750W will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (P)

HART 2755. Women in Art since 1850. Painting, sculpture, photography, and performance by European and American women artists. Intersections of gender, race, and sexuality in visual production. Feminist methods in art history. [3] (P)

HART 2760. Early American Modernism, 1865-1945. [Formerly HART 241] Painting and sculpture of the United States between the Civil War and the Second World War with emphasis on iconography, social history, class, and gender. [3] (US)

HART 2765. Art since 1945. [Formerly HART 242] A survey of art produced in the United States and Europe since 1945 with an emphasis upon theory and the social and intellectual factors. [3] (US)

HART 2775. History of Prints. Woodcut, engraving, etching, and lithography from the fifteenth to the twentieth century. Scientific, devotional, ornamental, and documentary functions. Dürer, Piranesi, Hogarth, Daumier, and Kollwitz. Advances in technique and marketing, relationship to fine art, and place in popular culture. [3] (HCA)

HART 2780. History of Western Urbanism. [Formerly HART 270] Urban form and planning from antiquity to the present. The integration of architecture and landscape. Diachronic surveys. Case studies, including Nashville. [3] (P)

HART 2782. Storied Places: History of Landscape Design. [Formerly HART 271] Landscape architecture as art form in Europe, Western Asia, and North America, from antiquity to the present. Stewardship and manipulation of land and water. Design of gardens and green spaces. Social and political meanings and messages. [3] (HCA)

HART 2815. Digital Heritage: Methods and Practice. Case-based introduction to digital applications in history of art and archaeology. Theory, research design, current methods of photogrammetry, 2D and 3D modeling, and immersive environments. Mapping and spatial analysis. Data management and digital publishing. May be repeated for credit with permission of the faculty. [3] (HCA)

HART 3112. The Arts of China during the Liao-Song Period. [Formerly HART 249] Art and architecture of China during the Liao-Song period from C.E. 907 to C.E. 1279. Political, religious, and aesthetic contexts. Influence

of coastal trade and pilgrimage in transformations of painting, sculpture, ceramics, and architecture. [3] (INT)

HART 3140. Healing and Art in East Asia. Influence of early healing practices on the development of the arts of East Asia. Magical healing texts, talismans, and tattoos; diagramming the body and the landscape; and the art of the Buddha of Medicine. Gardens and growing transformative herbs. Tea as medicine and art. Serves as repeat credit for HONS 1820W Section 28. [3] (HCA)

HART 3164W. Art of Buddhist Relic and Reliquary. [Formerly HART 245W] From second century BCE to present. Relic veneration and construction of reliquaries from a visual perspective. Beautification, ritualization, use and abuse, and bodily issues spanning India, China, Korea, Japan, and Southeast Asia. [3] (INT)

HART 3172. Himalayan Art: Art of the Divine Abode. [Formerly HART 247] Art of Nepal and Tibet from its inception to the present. Religious and cultural contexts. Initial western responses; Hindu and Buddhist art and architecture in Nepal; Tibetan Buddhist Art; artistic productions in the Tibetan diaspora; and souvenir art in Nepal. [3] (INT)

HART 3173W. Art and Empire in India. Art of India between the Mughal and British empires. Rise of colonialism and nationalism; cross-cultural encounters; and emergence of new institutions and technology. Offered on a graded basis only. [3] (P)

HART 3174. The South Asian Temple. [Formerly HART 248] From its inception to the present. Morphological and stylistic analysis. Anthropological and ethnographical approach to temples as living communal entities. [3] (INT)

HART 3224. Greek Sculpture. [Formerly HART 264] Style, materials, and techniques ca. 900-31 B.C. Sculptors' craft and their reasons for the creation of both free-standing and architectural sculpture. [3] (HCA)

HART 3226. Greek Vases and Society. [Formerly HART 265] Ancient Greek vases as social documents. Interdisciplinary approaches, including historiographic, stylistic, semiotic, contextual, and scientific. Production, trade, and the functions of vases in funerary and ritual contexts, particularly the symposium. The development of black- and red-figure vase painting and iconography. [3] (HCA)

HART 3228W. Gender and Sexuality in Greek Art. [Formerly HART 262W] Iconography of vase-painting and sculpture, from the Archaic through the Hellenistic periods. Visual constructions of bodies, poses, gestures, and dress, reflecting cultural attitudes towards courtship, marriage, rape, prostitution, and homosexuality. Emphasis on methodological approaches and comparisons with modern societies. Offered on a graded basis only. [3] (HCA)

HART 3240W. Ancient Landscapes. [Formerly HART 260W] Greco-Roman attitudes toward nature. Exploitation and stewardship of resources. Country-house and garden design. Representations of mythological and sacred landscapes in painting and poetry. [3] (HCA)

HART 3252. Cities of the Roman East. [Formerly HART 266] Provincial centers, sanctuaries, and monuments from Greece to Arabia. Major centers and case studies of public and private commissions. Architectural reflections of Romanization and resistance; local and imperial patronage; patrimony and memory; borderland architecture. [3] (HCA)

HART 3272. Portraits in Late Antiquity. [Formerly HART 206] Social, political, and religious functions of portraits from the first century through the sixth century CE. Issues of representation, including the construction of identity, social status, mediation of presence through image, and what constitutes a likeness. Portraits as memorials, as objects of veneration, and idealized models. Influences on later portraiture. [3] (HCA)

HART 3274. Art and Empire from Constantine to Justinian. [Formerly HART 208] An interdisciplinary study of Roman social, political, religious, and art historical developments in the fourth through sixth centuries CE. [3] (HCA)

HART 3320. Early Renaissance Florence. [Formerly HART 217] Painting and sculpture in fifteenth-century Florence. Ghiberti, Donatello, Masaccio, Fra Angelico, and Botticelli. Stylistic progression; iconographic interpretation and meaning; the role of patronage and audience; and original physi-

cal and cultural context. The Italian Renaissance workshop. Not open to students who have earned credit for HART 2310 without permission. Total credit for this course and 2310 will not exceed 4 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Serves as repeat credit for HART 3320W. [3] (HCA)

HART 3320W. Early Renaissance Florence. [Formerly HART 217W] Painting and sculpture in fifteenth-century Florence. Ghiberti, Donatello, Masaccio, Fra Angelico, and Botticelli. Stylistic progression, iconographic interpretation and meaning, the role of patronage and audience, original physical and cultural context, and the Italian Renaissance workshop. Offered on a graded basis only. Not open to students who have earned credit for HART 2310 without permission. Total credit for this course and HART 2310 will not exceed 4 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Serves as repeat credit for HART 3320. [3] (HCA)

HART 3332. Raphael and the Renaissance. [Formerly HART 216] Art in Central Italy, ca. 1400-1520, with a focus on Raffaello Sanzio. His origin and artistic formation in Urbino and Perugia, early commissions in Florence, mature works and legacy in Rome. Predecessors Masaccio, Donatello, Piero della Francesca, and Pietro Perugino. Contemporaries Leonardo and Michelangelo. Taught on location in Italy. [3] (INT)

HART 3334. Michelangelo's Life and Works. [Formerly HART 220] Sculpture, painting, architecture, and graphic works. Poetry and letters. Cultural, historical, religious, and political climate of his day. Influence upon artists. Critical reception. Repeat credit for students who have completed 3334W. [3] (HCA)

HART 3334W. Michelangelo's Life and Works. [Formerly HART 220W] Sculpture, painting, architecture, and graphic works. Poetry and letters. Cultural, historical, religious, and political climate of his day. Influence upon artists. Critical reception. Repeat credit for students who have completed 3334. [3] (HCA)

HART 3364W. The Court of Burgundy. [Formerly HART 213W] The visual arts of the Dukes of Burgundy (1363-1477) in cultural context. Portraiture, chivalry, costume, storytelling, and ceremony. Artists include Claus Sluter, Jan van Eyck, and Rogier van der Weyden. [3] (HCA)

HART 3605W. French Art in the Age of Louis XV: From Rococo to Neoclassicism. Court art and visual culture 1715 to 1775. Aesthetic development in painting, sculpture, interior design, and architecture. Watteau, Boucher, Fragonard, Falconet, Boffrand. Chinoiserie and exoticisms, porcelain industry at Sèvres, and domestication of royal spaces at Versailles. Women patrons such as Mme de Pompadour and Mme du Barry. Offered on a graded basis only. [3] (INT)

HART 3712W. Surrealism. 20th- and 21st-century painting, sculpture, film, photography, and computer-generated and internet-based new media. Origins in France to international proliferation. Salvador Dalí, René Magritte, Luis Buñuel, Meret Oppenheim, and Frida Kahlo. Stylistic, thematic, and ideological issues in their historical and cultural context. [3] (HCA)

HART 3718W. Twentieth-Century Mexican Art: Painting, Cinema, Literature. [Formerly HART 236W] From muralism to performance art. Relationship between artistic style and historical context. Analysis of ideological content. Rivera, Orozco, Kahlo, Modotti, Paz. Offered on a graded basis only. [3] (HCA)

HART 3725W. The Skyscraper: Modern Urban Icon. Development of the architectural type from the late 19th to the mid-20th century, seen from stylistic, technological, urban, artistic, and economic perspectives. [3] (HCA)

HART 3730. Twentieth-Century Sculpture. [Formerly HART 234] Definitions, materials, movements, theories, and related practices, including architecture. [3] (HCA)

HART 3735. History of Photography. [Formerly HART 233] Uses and meanings of photography from its invention (c. 1839) to the present. Ways of thinking about the medium and its status as a separate discipline in relation to the history of art. [3] (HCA)

HART 3740. History of Sound Art. [Formerly HART 243] From twentieth century to present. Use of sound as artistic medium. Experimental practices; the relationship of art and technology; sound art's position between

music, performance and installation art. Cage, Cardiff, Paik, Rosenfeld, and Trimpin. [3] (HCA)

HART 3757W. Women in Architecture. Women's contributions to the built environment as architects, patrons, critics, and social reformers, primarily in the 19th and 20th centuries. Perspectives of feminism, gender, race, and sexuality studies. Julia Morgan, Eileen Gray, Charlotte Perriand, Denise Scott Brown, and Zaha Hadid. [3] (P)

HART 3766W. Post-1871 Berlin Monuments, Memorials, and City Planning. Berlin's city planning; monuments and memorials from the beginning of the German Empire. Political, social, and cultural history, including World War II, the Holocaust, and the Cold War. Brandenburg Gate, Berlin Palace, Reichstag, Holocaust Memorial, Jewish Museum, and Berlin Wall. [3] (P)

HART 3767W. Neo-Dada and Pop Art. Artistic movements at the end of modernism and beginning of postmodernism, 1955-1980. Intersection with music, consumer culture, advertising, and economics. Jackson Pollock, Robert Rauschenberg, Jasper Johns, Andy Warhol, and Roy Lichtenstein. Issues of gender and sexuality through construction of femininity and masculinity. [3] (US)

HART 3790. Monumental Landscapes of Provence. First millennium BCE to the present. Architecture and art, physical geography and natural resources in Mediterranean France. Greek-Gallic interactions, Roman urbanism, medieval institutions, and modern painting and design. Based in Aix-en-Provence and Marseille. [3] (HCA)

HART 3810. Exhibiting Historical Art. Research and exhibition of art in the permanent collection of the Vanderbilt University Fine Arts Gallery. Research methods and principles of object organization and display, illustrated via selected objects that vary annually. May be repeated for credit once if there is no duplication in topic and not twice from the same instructor. Offered on a graded basis only. (Maximum of 6 credits total for all semesters of 3810 and 3810W). [3] (HCA)

HART 3810W. Exhibiting Historical Art. [Formerly HART 280W] Research and exhibition of art in the permanent collection of the Vanderbilt University Fine Arts Gallery. Research methods and principles of object organization and display, illustrated via selected objects that vary annually. May be repeated for credit once if there is no duplication in topic and not twice from the same instructor. Offered on a graded basis only. (Maximum of 6 credits total for all semesters of 3810 and 3810W). [3] (HCA)

HART 3840. Directed Study. [Formerly HART 290] Registration only with agreement of instructor involved and with written approval of the director of undergraduate studies. May be repeated for a total of 6 credits, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of HART 3840] (No AXLE credit)

HART 3850. Independent Research. [Formerly HART 289] Supervised work in extension of regular offerings in the curriculum. Registration only with agreement of instructor involved and with written approval of the director of undergraduate studies. May be repeated for a total of 6 credits, but students may earn only up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

HART 3880. Internship Training. [Formerly HART 293B] Students gain experience in a broad range of arts-related programs, at public or private institutions, including museums, and/or federal agencies. Students may take 1-3 hours in 3883, which includes background research, done concurrently with a one-semester internship program (3880), leading to submission of a research paper at the end of that semester. A 3.0 grade point average, approval of a specific plan by the department, and at least 6 hours of prior work in History of Art is required. Offered only on a pass/fail basis only and must be taken concurrently with 3883. Will not count as part of the minimum hours for the History of Art major or minor. Corequisite: 3883. [Variable credit: 1-9] (No AXLE credit).

HART 3883. Internship Research. [Formerly HART 293A] Students gain experience in a broad range of arts-related programs, at public or private institutions, including museums, and/or federal agencies. Students may take 1-3 hours in 3883, which includes background research, done concurrently with a one-semester internship program (3880), leading to submission of a research paper at the end of that semester. A 3.0 grade point

average, approval of a specific plan by the department, and at least 6 hours of prior work in History of Art is required. Readings and critiqued assignments under faculty supervision. Will not count as part of the minimum hours for the History of Art major or minor. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit).

HART 3890. Selected Topics. [Formerly HART 288] May be repeated for credit twice if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 9 credits total for all semesters of HART 3890] (No AXLE credit)

HART 4960. Advanced Seminar. [Formerly HART 295] An undergraduate seminar involving advanced in-depth reading, research, and writing in a particular area of art history. Limited to juniors and seniors with preference to majors. May be repeated for credit once if there is no duplication in topic and not twice from the same instructor. Students may enroll in more than one section of this course each semester. Offered on a graded basis only. [3; maximum of 6 credits total for all semesters of 295; maximum of 9 credits for HART Honors candidates] (HCA)

HART 4998. Honors Research. [Formerly HART 298] Research to be done in consultation with a member of the faculty in history of art. Open only to those beginning honors work in history of art. May be repeated for a total of 6 credits. [1-6; maximum of 6 credits total for all semesters of HART 4998] (No AXLE credit)

HART 4999. Honors Thesis. [Formerly HART 299] Open only to seniors in the departmental honors program. Students completing this course with distinction, including a thesis and final examination, will earn honors in history of art. Prerequisite: 4998. May be repeated for a total of 6 credits. [1-6; maximum of 6 credits total for all semesters of HART 4999] (No AXLE credit)

Honors

HONS 1810W. College Honors Seminar in the Humanities and Creative Arts. [Formerly HONS 181] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (HCA)

HONS 1820W. College Perspectives Honors Seminar. [Formerly HONS 182] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (P)

HONS 1830W. College Honors Seminar in Behavioral and Social Sciences. [Formerly HONS 183] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (SBS)

HONS 1840W. College Honors Seminar in History and Culture of the United States. [Formerly HONS 184] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (US)

HONS 1850W. College Honors Seminar in Mathematics and Natural Science. [Formerly HONS 185] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (MNS)

HONS 1860W. College Honors Seminar in International Cultures. [Formerly HONS 186] Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (INT)

Humanities

HUM 1610. Selected Topics. [Formerly HUM 161] Topics Vary. May be repeated more than once if there is no duplication of topic. [3] (No AXLE credit)

Interdisciplinary Studies

INDS 3831. Global Citizenship and Service. [Formerly INDS 270A] This course is offered by the Vanderbilt Initiative for Scholarship and Engagement (VISAGE). Graduate students may take this course for graduate credit. A service-learning course introducing students to themes and interpretations of global citizenship. Intended to be followed by 3832. [3] (INT)

INDS 3832. Global Community Service. [Formerly INDS 270B] This course is offered by the Vanderbilt Initiative for Scholarship and Engagement (VISAGE). Graduate students may take this course for graduate credit. Students will design and conduct research projects in collaboration with faculty mentors. Prerequisite: 3831. [1-3] (No AXLE credit)

INDS 3833. Seminar in Global Citizenship and Service. [Formerly INDS 270C] This course is offered by the Vanderbilt Initiative for Scholarship and Engagement (VISAGE). Graduate students may take this course for graduate credit. Project- and research-based seminar drawing on student experiences and learning in 3831 and 3832. Prerequisite: 3832. [3] (INT)

INDS 3880. Interdisciplinary Internship. [Formerly INDS 280A, 280B, 280C] Internship credit for work approved by the designated Associate Dean of Arts and Science. A written scholarly project must be produced in the internship. Must be taken P/F. Repeatable twice for a maximum of 3 credit hours in 3880 (and 3884) combined. [1] (No AXLE credit)

INDS 3884. Interdisciplinary Internship. [Formerly INDS 280D] Internship credit for summer work approved by the designated Associate Dean of Arts and Science. A written scholarly project must be produced in the internship. Course must be taken P/F. May be repeated for credit; maximum of 3 credit hours in 3881, 3882, 3883, and 3884 combined. [1] (No AXLE credit)

INDS 3990. Interdisciplinary internship Training. Under faculty supervision students from any discipline can gain experience in a variety of public and private settings. Students must be classified as a sophomore or higher and in good academic standing at the time the credit is earned. Must be taken on a Pass/Fail basis. Prerequisite or co-requisite: 3991 [1-3] (No AXLE credit)

INDS 3991. Interdisciplinary Internship Readings and Research. Under faculty supervision students from any discipline can gain experience in a variety of public and private settings. Students must be classified as a sophomore or higher and in good academic standing at the time the credit is earned. A thorough research paper or written report is required at the end of the semester. Must be taken on a graded basis only. [1-3] (No AXLE credit)

Italian

ITA 1001. Commons iSeminar. [Formerly ITA 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

ITA 1101. Elementary Italian. [Formerly ITA 101A] Introduction to reading, writing, and speaking through an exploration of Italian culture. For students who have studied little or no Italian. No credit for students who have earned credit for a more advanced Italian language course. [3] (No AXLE credit)

ITA 1102. Elementary Italian. [Formerly ITA 101B] Study of the language through an exploration of Italian culture. No credit for students who have earned credit for a more advanced Italian language course. Prerequisite: 1101. [3] (INT)

ITA 1103. Intensive Elementary Italian. [Formerly ITA 102] One-semester intensive course for students who have some knowledge of Italian or of another romance language. No credit for students who have earned credit for 1101, 1102, or a more advanced Italian language course. [3] (INT)

ITA 1111. First-Year Writing Seminar. [Formerly ITA 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

ITA 2203. Intermediate Italian. [Formerly ITA 200] Life and art in the diverse regions of Italy through an integrated four-skills approach of reading, writing, listening and speaking. No credit for students who have earned credit for a more advanced Italian language course. Prerequisite: 1102 or 1103. [3] (INT)

ITA 2501W. Grammar and Composition. [Formerly ITA 201W] Syntax, idiomatic expressions, and current usage. Prerequisite: 2203. [3] (INT)

ITA 2614. Conversation. [Formerly ITA 214] Development of oral proficiency through analysis and discussion of films, magazine articles, and contemporary art and literature. Prerequisite: 2203. [3] (INT)

ITA 3000. Introduction to Italian Literature. [Formerly ITA 220] Critical reading of major works of Italian literature from the beginning to the present. Prerequisite: 2501W. [3] (HCA)

ITA 3041. Italian Civilization. [Formerly ITA 230] The politics, intellectual, social, artistic, and economic history of Italy from 1300 to the present, with emphasis on major political and philosophical authors. Taught in English. [3] (INT)

ITA 3100. Literature from the Middle Ages to the Renaissance. [Formerly ITA 232] The ideas and forms of the Trecento, Quattrocento, and Cinquecento, as reflected in the philosophy, history, literature, and art history of these periods. Major writers and their influence on Western European literatures. Prerequisite: 2501W. [3] (HCA)

ITA 3240. Dante's Divine Comedy. [Formerly ITA 231] Dante's language and philosophical tenets through the study of style, characters, and themes. Taught in English. [3] (HCA)

ITA 3242. Dante in Historical Context. [Formerly ITA 288] Dante's philosophical and critical works in their medieval historical context and his influence in building a modern Western civilization. Knowledge of Italian not required. [3] (HCA)

ITA 3340. Famous Women from Antiquity to Renaissance. [Formerly ITA 250] Texts on famous women from Antiquity to the Renaissance in Latin, Italian, French, and English literature. Reception, contemporary criticism, and theory. Texts in English translation; taught in English. [3] (HCA)

ITA 3500. Baroque, Illuminismo, and Romanticism in Italy. [Formerly ITA 233] Literature of the seventeenth through nineteenth centuries, with particular reference to the influence of European literatures in Italy. Prerequisite: 2501W. [3] (HCA)

ITA 3600. Twentieth-Century Literature: Beauty and Chaos. [Formerly ITA 235] Poetry and prose in social and historical context. Prerequisite: 2501W. [3] (HCA)

ITA 3640. Classic Italian Cinema. [Formerly ITA 240] From the 1910s to the 1970s. Selected works from Neorealism to Art Film. Relationship between cinema and the other arts. Contrasting film styles, including abstraction and realism, and tradition and transgression. Knowledge of Italian is not required. [3] (INT)

ITA 3641. Contemporary Italian Cinema. [Formerly ITA 241] From the 1970s to the present. Postmodern forays into metafiction, parody, and political and social critique. The return to realism and New Regionalism in the twenty-first century. Knowledge of Italian is not required. [3] (HCA)

ITA 3642. Italian Visual Culture. [Formerly ITA 280] Parallels between Italian literature and the visual arts, including painting, cinema, and intermediality. Focus on the representation of the visual arts in literature, the representation of literature in the visual arts, and Italy as the cradle of Western visual culture. Prerequisite: 2203. [3] (HCA)

ITA 3701. City Fictions. [Formerly ITA 238] Interdisciplinary exploration of how Italian authors, directors, and artists aspire to change the way readers and viewers understand and experience urban realities. Social, cultural, geographical, and architectural aspects of Italian cities as depicted in fiction, travel literature, cinematic images, the visual arts, and music. Prerequisite: 2203. [3] (P)

ITA 3702. Topics in Contemporary Italian Civilization. [Formerly ITA 239] Short stories, historical documents, and articles from the press. Prerequisite: 2501W. [3] (No AXLE credit)

ITA 3703. Italy: A World Cultures and Languages. Diversity in Italian culture and language from earliest records to the present. Communicative aspects of contemporary Italian; improvement of phonetic skills and understanding of social, cultural, and linguistic aspects. Oral and written sources in standard and regional Italian, with a focus on mass media. Prerequisite: 2203. [3] (P)

ITA 3704. Made-in-Italy: Italianness in Italy and Abroad. Cultural, historical, and economic analysis of Italian brands and products in Italy and the USA, and the aspects that determine their quality or representative mark. Fashion brands, design products, architectural styles, and popular music from local and global perspectives. Italian and American artistic and cinematic representations of Made-in-Italy. Taught in English. [3] (INT)

ITA 3740. Gangsters, Lovers, Madonnas, and Mistresses. [Formerly ITA 236] The history of Italian immigration in the United States. American representations of Italians and Italian-Americans from 1900 to the present. Cinematographic and literary images of Italians and Italian Americans. Historical and anthropological scholarship. Films, fiction, ethnic marketing, and travel writing. Knowledge of Italian is not required. [3] (US)

ITA 3802. Contemporary Italian Society and Culture. [Formerly ITA 242] Capitalism and modernization, immigration, and multiculturalism. Racism, youth culture, gender, sexuality, and feminism. Changing definitions of family. Regionalism, entertainment, and sport. Prerequisite: 2203. [3] (P)

ITA 3803. Mediterranean Culture (taught in Sicily and Italy). [Formerly ITA 243] Culture and history of the Mediterranean. Taught in Sicily and the Italian peninsula. Knowledge of Italian is not required. [3] (HCA)

ITA 3850. Independent Study. [Formerly ITA 289] A reading course, the content of which varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available in the regular curriculum. May be repeated for a total of 12 credits over a four-semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of ITA 3850] (No AXLE credit)

ITA 3890. Special Topics in Italian Literature. [Formerly ITA 294A] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2501W. [3] (No AXLE credit)

Japanese

JAPN 1011. Basic Japanese I. [Formerly JAPN 200A] Simple conversation, writing system, and reading. Designed exclusively for students with little or no previous exposure to Japanese. No credit for students who have earned credit for 1101 or a more advanced Japanese language course. [3] (No AXLE credit)

JAPN 1012. Basic Japanese II. [Formerly JAPN 200B] No credit for students who have earned credit for 1101 or a more advanced Japanese language course. Prerequisite: 1011. [3] (No AXLE credit)

JAPN 1101. Elementary Japanese I. [Formerly JAPN 201] Acquisition of oral-aural skills and basic grammar. Introduction to reading and writing Japanese syllabaries and Chinese characters. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for 1012 or a more advanced Japanese language course. [5] (No AXLE credit)

JAPN 1102. Elementary Japanese II. [Formerly JAPN 202] Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 1012 or 1101. [5] (INT)

JAPN 1231. Tadoku: Extensive Reading in Japanese. Develop reading skills in Modern Japanese, using extensive reading method. Prerequisite: 1101. [1] (No AXLE credit)

JAPN 2201. Intermediate Japanese I. [Formerly JAPN 211] Development of conversational skills and linguistic competence. Syntax, writing, and reading. Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 1102. [5] (INT)

JAPN 2202. Intermediate Japanese II. [Formerly JAPN 212] Two hours of lecture and three hours of drill per week. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 2201. [5] (INT)

JAPN 2232. Japanese through Manga. [Formerly JAPN 232] Reading and analysis of Japanese comic books. Language skills and knowledge of contemporary Japanese popular culture. Basic knowledge of hiragana and katakana required. [1] (No AXLE credit)

JAPN 3301. Advanced Japanese I. [Formerly JAPN 241] Reading and writing in contemporary Japanese texts. Conversation, discussion, and development of pragmatic competence. No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 2202. [3] (INT)

JAPN 3302. Advanced Japanese II. [Formerly JAPN 242] No credit for students who have earned credit for a more advanced Japanese language course. Prerequisite: 3301. [3] (INT)

JAPN 3302W. Advanced Japanese II. Reading and writing essays in Japanese. Sophisticated vocabulary and grammatical construction through discussion and composition. No credit for students who have earned credit for a more advanced Japanese language course. Repeat credit for students who have earned credit for 3302. Prerequisite: 3301. [3] (INT)

JAPN 3851. Independent Study. [Formerly JAPN 289A] A reading course which may be repeated with variable content according to the needs of the individual student. Primarily designed to cover materials not otherwise available in the regular curriculum. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for all semesters of JAPN 3851 and 3852] (No AXLE credit)

JAPN 3852. Independent Study. [Formerly JAPN 289B] A reading course which may be repeated with variable content according to the needs of the individual student. Primarily designed to cover materials not otherwise available in the regular curriculum. May be repeated for a total of 12 credits in 3851 and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for all semesters of JAPN 3851 and 3852] (No AXLE credit)

JAPN 3891. Special Topics in Advanced Japanese. [Formerly JAPN 251] Reading, writing, and discussion in authentic Japanese cultural, literary, and historical texts. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3302. [3] (INT)

Jewish Studies

JS 1001. Commons iSeminar. [Formerly JS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

JS 1002. Introduction to Jewish Studies. [Formerly JS 180] Introduction to Judaism and Jewish history through philosophical, political, social, psychological, and artistic perspectives. Biblical studies; and culture, philosophy, and literature. Antiquity and the medieval world; modern and contemporary experience. Repeat credit for students who have completed 1002W. [3] (INT)

JS 1002W. Introduction to Jewish Studies. [Formerly JS 180W] Introduction to Judaism and Jewish history through philosophical, political, social, psychological, and artistic perspectives. Biblical studies; culture, philosophy, and literature. Antiquity and the medieval world; modern and contemporary experience. Repeat credit for students who have completed 1002. [3] (INT)

JS 1010. Judaism: An Introduction. Judaism from the ancient Near East to the present day. The Jewish life cycle. Varieties of Jewish practice throughout history. Interaction and dialogue with other religious communities, and the challenges posed by modernity in the wake of Jewish 'enlightenment' and political emancipation. [3] (INT)

JS 1040. Introduction to Modern Jewish History. [Formerly JS 1240] Meaning and origins of modern Jewish history from 1492. The diverse

experiences of Jewish communities across the globe. Men's and women's redefinition of Jewish identity as they confronted modernity. Rise of secular rights for Jews but also of new forms of persecution. No credit for students who have earned credit for JS 1240. [3] (P)

JS 1111. First-Year Writing Seminar. [Formerly JS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

JS 1200. Classical Judaism: Jews in Antiquity. [Formerly JS 122] History of the Jewish people from biblical origins through the 2nd century CE. The Hellenistic Age, the Age of the Maccabees, Roman rule, and the rise of the Rabbis and Rabbinic literature. [3] (HCA)

JS 1220. Jews in the Medieval World. [Formerly JS 123] Jewish experience from the 2nd century CE to 1492. Legal status of Jews; economic and religious developments. Burning the Talmud, age of charters, reaction to the Crusades, Jewish expulsion from Spain. [3] (INT)

JS 2100. The New Testament in Its Jewish Contexts. [Formerly JS 219] Documents of the origin of Christianity and the social, literary, ideological, and theological contexts in which they emerged and which they reflect. Various critical methodologies employed in interpreting them. [3] (P)

JS 2150. Issues in Rabbinic Literature. [Formerly JS 233] History of Rabbinic thought from its origins to the Middle Ages through the reading of central Rabbinic texts. Capital punishment, women in Rabbinic culture, sectarianism, and the power structures of Roman Palestine and Sasanian Babylonia. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [3] (INT)

JS 2210W. Hebrew Literature in Translation. [Formerly JS 235W] Origins and development in Eastern Europe from the nineteenth century to postmodern Israeli literature. The relationship between historical transformations and literary form. [3] (INT)

JS 2215. Modern Yiddish Literature in Translation. Late nineteenth to mid-twentieth century. Diaspora, minority writing, gender, from shtetl to city, and the Holocaust. [3] (INT)

JS 2220. Israeli Culture through Film. Cinematic representations of modern Israeli culture. Historical, social, and political aspects. Constructions of national identity. Treatments of war and conflict, ethnicity, gender, and Zionism. [3] (INT)

JS 2230W. American Southern Jews in Life and Literature. [Formerly JS 162W] From colonial times to the present. Interactions between Southern Jews and other Southerners, and between Southern and Northern Jews. The Civil War, Jewish economic activities, and the civil rights movement. [3] (US)

JS 2240W. Black-Jewish Relations in Post-War American Literature and Culture. [Formerly JS 137W] The historical relationship between African Americans and Jewish Americans and its portrayal in novels, short stories, and films by artists from both communities. [3] (US)

JS 2250W. Witnesses Who Were Not There: Literature of the Children of Holocaust Survivors. [Formerly JS 253W] Fiction and non-fiction produced by children of Holocaust survivors. [3] (HCA)

JS 2255. Creative Writing from Jewish Perspectives. Creative writing course with readings as broad how-to guides. How Jewish and non-Jewish writers engage with or distance themselves from their socio-ethnic/religious identity. Reading and writing in multiple genres including short stories, autobiography, poetry, plays, screenplays and song lyrics. Exploration of different styles and techniques of writing, such as narrative voice and dialogue. [3] (HCA)

JS 2260. Coming of Age in Jewish Literature and Film. [Formerly JS 237] The transition of young Jewish protagonists into adulthood as portrayed in literary works and films from Europe, Africa, and the Americas. Repeat credit for students who have completed 2260W. [3] (INT)

JS 2260W. Coming of Age in Jewish Literature and Film. [Formerly JS 237W] The transition of young Jewish protagonists into adulthood as portrayed in literary works and films from Europe, Africa, and the Americas. Repeat credit for students who have completed 2260. [3] (INT)

JS 2270. Jewish Storytelling. [Formerly JS 248] Twentieth-century short fiction and narrative traditions. The transition from religious to secular cultural forms. Immigration and ethnic literary forms. All works are in English or English translation from Yiddish, Hebrew, and Russian. Repeat credit for students who have completed 2270W. [3] (HCA)

JS 2270W. Jewish Storytelling. [Formerly JS 248W] Twentieth-century short fiction and narrative traditions. The transition from religious to secular cultural forms. Immigration and ethnic literary forms. All works are in English or English translation from Yiddish, Hebrew, and Russian. Repeat credit for students who have completed 2270. [3] (HCA)

JS 2280. Jewish Humor. [Formerly JS 138] The flowering of Jewish humor, especially in the U.S. during the twentieth century. Vaudeville, radio comedy, and the Golden Age of television. The careers and works of influential comics, writers and filmmakers, and the development of stand-up comedy. The effect of Talmudic disputes, Yiddish wordplay, and the history of Diaspora life upon secular Jewish comedians, essayists, playwrights, and fiction writers. Repeat credit for students who have completed 2280W. [3] (US)

JS 2280W. Jewish Humor. [Formerly JS 138W] The flowering of Jewish humor, especially in the U.S. during the twentieth century. Vaudeville, radio comedy, and the Golden Age of television. The careers and works of influential comics, writers and filmmakers, and the development of stand-up comedy. The effect of Talmudic disputes, Yiddish wordplay, and the history of Diaspora life upon secular Jewish comedians, essayists, playwrights, and fiction writers. Repeat credit for students who have completed 2280. [3] (US)

JS 2290W. Imagining the Alien: Jewish Science Fiction. [Formerly JS 136W] Science fiction and speculative fiction by Jewish writers in cultural context. Aliens, robots, and secret identities; time travel; utopia and political critique; questions of Jewish identity. [3] (HCA)

JS 2300. Modern Jewish Thought. [Formerly JS 240] Jewish intellectual responses to major transformations of modernity. Impact of secularization, universalism, pluralism, nationalism, and gender theories on Jewish thought and identity. Conflicting perspectives of tradition, education, culture, and religion. Relationship between Israel and the diaspora. [3] (P)

JS 2320. Freud and Jewish Identity. [Formerly JS 244] Analysis of rhetoric and themes in selected writings of Sigmund Freud and his times, development of assimilation and of anti-Semitic repudiation. [3] (SBS)

JS 2330. Is G-d Guilty? The Problem of Evil in Judaism. [Formerly JS 250] Origin, nature, and representations of evil from Scripture through the Hasidic masters. Reflections of modern thinkers. [3] (HCA)

JS 2340. Jewish Philosophy after Auschwitz. [Formerly JS 249] Critical responses to social and political institutions and the corresponding modes of thought that made Auschwitz possible and continue to sustain the barbarism that many leading philosophers have identified at the heart of culture. [3] (INT)

JS 2400. American Jewish Life. [Formerly JS 155] Diversity, individualism, and change in Jewish life. Food and culture, memory and identity, gender and assimilation, Reform-Conservative-Orthodox culture wars. [3] (SBS)

JS 2420W. American Jewish Songwriters. [Formerly JS 139W] From the late 19th Century to the present. Vaudeville, Tin Pan Alley, the development of the stage musical, and the Brill Building. Folk, rock, pop, and country. Contributions of Jewish songwriters to American music. [3] (US)

JS 2440. Jewish American Literature. Nineteenth century to the present. Issues of race, gender, ethnicity, immigration, and diaspora. Offered on a graded basis only. [3] (HCA)

JS 2450. The Jewish Diaspora. [Formerly JS 158] Changing Jewish communities, especially outside the United States and Israel, in macro-historical context. Post-communist European Jewish identity. New global diasporas and their relationship to the largest Jewish communities in Israel and the United States. [3] (INT)

JS 2500. Modern Israel. [Formerly JS 125] Internal dynamics, debates, and conflicts within Israeli society. Political, social, and cultural transformations from the 1980s to the present. [3] (INT)

JS 2520. Zionism: Politics, Religion, and Ethnicity. [Formerly JS 255] Tensions among religion, nationalism, and political activism. Translations of Messianism into a secular program. Criticism from within and without the movement. [3] (HCA)

JS 2540. Power and Diplomacy in the Modern Middle East. [Formerly JS 256] History of the Middle East in the 19th and 20th centuries with an emphasis on U.S. involvement after 1945. U.S. relationship with Israel, and its impact on the region. [3] (INT)

JS 2560. Social Movements in Modern Jewish Life. [Formerly JS 252] How social movements shape contemporary American Jewish culture and politics. Explores movements internal to Judaism and those bringing religion into the public sphere. [3] (SBS)

JS 2600. Muslims and Jews. [Formerly JS 120] Muslim-Jewish relations from the birth of Islam to the 21st century. The Quran and the Jews. Jews in the Islamic world. Jewish cultures and Islamic cultures. Jewish exodus from the Islamic world. Muslims in Israel today. ISIS and the Jews. [3] (INT)

JS 2620. Jews in Egypt. [Formerly JS 222] Jewish life and experience under Egyptian, Greek, Roman, and Muslim rule in Egypt from the Ptolemies to 1956. Jewish self-government, economic life, and culture over twenty-two centuries, through letters, documents, and imaginative literature. [3] (INT)

JS 2640. Jews and Greeks. [Formerly JS 230] From the seventh century BCE to ca. 1500 CE. Sites of interaction, languages, cultural ties, religious tensions, political conflicts, and competing philosophies. Works by Eliephantine, Alexander the Great, the Maccabees, the Septuagint, Aristeas, Josephus, Philo, the rabbis, the New Testament, Ezekiel the Tragedian, Byzantium. [3] (INT)

JS 3000. Major Themes in Jewish Studies. [Formerly JS 245] The study of Jews, Judaism, and Jewish culture. History of Jewish Studies, core perspectives, key methodologies, critical debates. Classical literature, current trends. [3] (P)

JS 3100. The Holocaust. [Formerly JS 156] The history of the Holocaust: its origins, development, and its legacy in the context of Germany and European history. [3] (INT)

JS 3210. Reading Across Boundaries: Jewish and Non-Jewish Texts. [Formerly JS 234] Jewish and non-Jewish literary and historical texts studied in parallel so as to discover the differences between them. The course will consider texts from the ancient world to the early modern period and ask what constitutes Jewish writing, and how it has been defined through time and geography. All readings will be in English. [3] (INT)

JS 3730. The Roman to Medieval Near East: Caesarea Excavations, Israel. From Herod the Great to the Mamluk conquest. Excavation of the site of Caesarea on the Mediterranean coast. Social, cultural, economic, and religious history. Maritime commerce; Roman rule; and the Christian, Jewish, and Muslim communities. Archaeological methods, geospatial analysis, and processing artifacts. Monumental architecture, urban topography, and littoral environment. Daily field and laboratory work with additional seminars and excursions. [3] (INT)

JS 3830. Contemporary Jewish Issues. [Formerly JS 280] Projects will vary according to the instructor. Service to community will be integral part of course. [3] (No AXLE credit)

JS 3840. Directed Readings. [Formerly JS 290] Advanced readings and research on a selected topic done under the supervision of a faculty mentor. [3] (No AXLE credit)

JS 3850. Independent Study. [Formerly JS 289] A research project carried out under the supervision of a faculty mentor. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of JS 3850] (No AXLE credit)

JS 3880. Internship Training. [Formerly JS 288A] Under faculty supervision, students gain experience in any of a variety of settings, such as community, municipal, or government agencies. A thorough report and

research paper are required. Must be taken on a Pass/Fail basis only and must be taken concurrently with 3883. Corequisite: 3883. [Variable credit: 1-3] (No AXLE credit)

JS 3883. Internship Research. [Formerly JS 288B] Under faculty supervision, students gain experience in any of a variety of settings, such as community, municipal, or government agencies. A thorough report and research paper are required. Students will write a research paper drawing on their experiences in 3880. Corequisite: 3880. [3] (No AXLE credit)

JS 3890. Special Topics. [Formerly JS 284] Topics as announced. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

JS 3892. Topics in Ancient and Medieval Jewish History. [Formerly JS 257] From antiquity to 1492. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

JS 3894. Topics in Modern Jewish History. [Formerly JS 258] From 1492 to the present. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

JS 4301. Jewish Language and Paleography. [Formerly JS 238] Advanced study in a language of the Jewish people with a particular focus on the linguistic and paleographic features that define its cultural context. Each section focuses on one of the following languages: Aramaic, Ladino, Judaeo-Arabic, Rabbinic Hebrew, or Yiddish. May be repeated for credit up to two times when the language studied differs. Consent of instructor required. [3] (INT)

JS 4960. Senior Seminar. [Formerly JS 295] Advanced reading and research in a particular area of Jewish studies. [3] (No AXLE credit)

JS 4970. Senior Project in Jewish Studies. [Formerly JS 296] Readings and independent research. Prerequisite: senior standing. [3] (No AXLE credit)

JS 4980. Senior Honors Research Seminar. [Formerly JS 298A] Presentation and discussion of progress being made on honors theses. Open only to senior departmental honors students. [3] (No AXLE credit)

JS 4981. Senior Honors Research Seminar. [Formerly JS 298B] Presentation and discussion of progress being made on honors theses. Open only to senior departmental honors students. [3] (No AXLE credit)

K'iche'

KICH 1101. Elementary K'iche' I. Kaqchikel, K'iche', or Q'eqchi'. Basic speaking, reading, and writing skills. Offered on a graded basis only. Serves as repeat credit for students who have earned credit for ANTH 2612. [3] (No AXLE credit)

KICH 1102. Elementary K'iche' II. Intermediate level course with advanced grammar. Counterfactual constructions, deixis, verbal derivations of positional roots, sound symbolic verbs, and verbal nominalizations. Vocabulary and idioms. Various literary genres. Serves as repeat credit for ANTH 2614. Offered on a graded basis only. Prerequisite: 1101 or ANTH 2612. [3] (INT)

KICH 2201. Intermediate K'iche' I. Vocabulary, listening, and speaking skills. Modern and colonial texts. Cultural context of linguistic practices in K'iche' communities. Serves as repeat credit for ANTH 3614. Offered on a graded basis only. Prerequisite: 1102. [3] (INT)

KICH 2202. Intermediate K'iche' II. Taught in K'iche'. Advanced vocabulary, grammar, syntax, reading, and writing. Colonial and modern texts. Serves as repeat credit for ANTH 3615. Offered on a graded basis only. Prerequisite: 2201 or ANTH 3614. [3] (INT)

Korean

KOR 1101. Elementary Korean I. Introduction to Korean language for students who have no previous knowledge of Korean. Basic skills in speaking, listening, reading, and writing, with a focus on oral proficiency. No credit for students who have earned credit for a more advanced Korean language course. [5] (No AXLE credit)

KOR 1102. Elementary Korean II. Basic skills in speaking, listening, reading, and writing, with a focus on oral proficiency. No credit for students who have earned credit for a more advanced Korean language course. Prerequisite: 1101 [5] (INT)

KOR 2201. Intermediate Korean I. Speaking, listening, reading, and writing, with intensive exercises for spelling, basic grammar, and vocabulary. Cultural aspects of daily life in Korea. No credit for students who have earned credit for a more advanced Korean language course. Prerequisite: 1102. [5] (INT)

KOR 2202. Intermediate Korean II. Speaking, listening, reading, and writing, with intensive exercises for spelling, basic grammar, and vocabulary. Cultural aspects of daily life in Korea. No credit for students who have earned credit for a more advanced Korean language course. Prerequisite: 2201. [5] (INT)

KOR 3301. Advanced Korean I. Emphasis on formal speaking and writing. Introduction of four-character idioms and basic Chinese characters. No credit for students who have earned credit for a more advanced Korean language course. Prerequisite: KOR 2202. [3] (INT)

KOR 3302. Advanced Korean II. Emphasis on formal speaking and writing. Introduction of four-character idioms and basic Chinese characters. No credit for students who have earned credit for a more advanced Korean language course. Prerequisite: 3301. [3] (INT)

Latin

LAT 1101. Beginning Latin I. [Formerly LAT 101] Practice in speaking and writing. No credit for students who have earned credit for a more advanced Latin language course. Graded basis only. [3] (No AXLE credit)

LAT 1102. Beginning Latin II. [Formerly LAT 102] Transition to literary Latin. Emphasis on comprehension of texts. No credit for students who have earned credit for a more advanced Latin language course. Graded basis only. Prerequisite: 1101. [3] (INT)

LAT 1103. Intensive Elementary Latin. [Formerly LAT 100] The equivalent of Latin 1101 and 1102. This course presents the elements of the Latin language at an accelerated pace. Designed for students who have completed one or two years of Latin in high school but are not prepared to enter Latin 1102. No credit for students who have earned credit for 1101, 1102, or a more advanced Latin language course. [5] (INT)

LAT 2201. Intermediate Latin: Prose. [Formerly LAT 103] Review of Latin grammar and selected reading from major Latin authors. No credit for students who have earned credit for a more advanced Latin language course except 2202. [3] (INT)

LAT 2202. Intermediate Latin: Poetry. [Formerly LAT 104] Selected reading from the major Latin poets. No credit for students who have earned credit for a more advanced Latin language course. [3] (INT)

LAT 3010. The Writings of Caesar. [Formerly LAT 218] Selections from *The Civil War* and *The Gallic War*. Literary style and historical context. Prerequisite: 2202. [3] (HCA)

LAT 3020. Cicero and the Humanistic Tradition. [Formerly LAT 206] Study of Cicero's career and thought, and of his contribution to the development of the concept of *humanitas*. Readings from his letters, speeches, or philosophical works. Prerequisite: 2202. [3] (HCA)

LAT 3030. Latin Letters. [Formerly LAT 205] The literary letters of Seneca and Pliny, with a brief introduction to the personal correspondence of Cicero and the letters discovered at Vindolanda. Prerequisite: 2202. [3] (HCA)

LAT 3040. The Roman Historians. [Formerly LAT 215] Selections from Sallust, Livy, and Tacitus, with attention to their objectives and methods;

analysis of Roman historiography and its relation to Greek and early Christian historiography. Prerequisite: 2202. [3] (HCA)

LAT 3050. Suetonius. [Formerly LAT 217] Selections from the works of one of Rome's most important biographers, read in the context of the Latin biographical tradition as well as the political and social background. Prerequisite: 2202. [3] (HCA)

LAT 3060. Tacitus. [Formerly LAT 216] Selections from the works of one of Rome's most important historians, read in the context of historiographical tradition and political and social background. Prerequisite: 2202. [3] (HCA)

LAT 3100. Roman Comedy. [Formerly LAT 212] Reading of selected comedies of Plautus and Terence: study of the form of Roman comedy and its relation to the Greek New Comedy. Prerequisite: 2202. [3] (HCA)

LAT 3110. Catullus. [Formerly LAT 201] Reading and interpretation of Catullus' poems; aesthetic, political, and rhetorical contexts; fundamentals of Latin meter. Prerequisite: 2202. [3] (HCA)

LAT 3120. Lucretius: *De Rerum Natura*. [Formerly LAT 268] Lucretius' poem studied both in the tradition of Epicurean philosophy and as a landmark in the development of the Latin didactic epic; background material in the fragments of Epicurus and some treatment of the Epicurean movement in Italy and especially in Rome. Prerequisite: 2202. [3] (HCA)

LAT 3130. Vergil: *The Aeneid*. [Formerly LAT 220] An intensive study of the entire poem, in the context of the epic tradition. Prerequisite: 2202. [3] (HCA)

LAT 3140. The Lyric Poetry of Horace. [Formerly LAT 203] Reading and interpretation of Horace's Epodes and Odes; relation to the Greco-Roman lyric tradition and to Augustan politics. Prerequisite: 2202. [3] (HCA)

LAT 3150. Latin Elegy. [Formerly LAT 204] Authors who created a new type of love poetry during the rule of emperor Augustus: Tibullus, Propertius, Ovid, and Sulpicia. Construction and contestation of gender roles; political contexts; development of the elegiac couplet; modern responses. Prerequisite: 2202. [3] (HCA)

LAT 3160. Ovid. [Formerly LAT 202] Reading and interpretation of selections from the *Metamorphoses* or other works of Ovid. Prerequisite: 2202. [3] (HCA)

LAT 3170. Roman Satire. [Formerly LAT 264] The satires of Horace and Juvenal; the origins of Roman satire; history and conventions of the genre; background reading in other Roman satirists. Prerequisite: 2202. [3] (HCA)

LAT 3180. Neronian Writers. [Formerly LAT 267] Selections from authors in the literary renaissance during the reign of the artistic Emperor Nero, including Seneca, Lucan, Persius, and Petronius. Stylistic innovations, literary merits, and cultural contexts. Prerequisite: 2202. [3] (HCA)

LAT 3200. Early Christian Writers. [Formerly LAT 260] Selections from the writings of Latin Christians, from the account of Perpetua's martyrdom to the Confessions of Augustine. Prerequisite: 2202. [3] (HCA)

LAT 3850. Independent Study. [Formerly LAT 289] Designed for majors wanting to familiarize themselves with works or authors not covered in the regular curriculum. Prerequisite: 6 hours above 2202. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of LAT 3850] (No AXLE credit)

LAT 3890. Special Topics in Latin Literature. [Formerly LAT 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (HCA)

Latin American Studies

LAS 1001. Commons iSeminar. [Formerly LAS 99] Topics vary. General Elective credit only. [1] (No AXLE credit.)

LAS 1111. First-Year Writing Seminar. [Formerly LAS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if

there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

LAS 2101. Introduction to Latin America. [Formerly LAS 201] A multidisciplinary survey of Latin America from pre-Columbian times to the present emphasizing culture, economic and political patterns, social issues, literature, and the arts in a historical perspective. [3] (INT)

LAS 2102. Brazil: Past, Present, and Future. [Formerly LAS 202] A multidisciplinary survey of Brazil from pre-Columbian times to the present. Culture, economic and political patterns, social issues, literature, and the arts in historical perspective. [3] (INT)

LAS 2301. Music of Protest and Social Change in Latin America. [Formerly LAS 231] Politics of musical culture. Music both as a marker of sociopolitical change and as an agent of political transformation. [3] (INT)

LAS 2601. Latin America, Latinos, and the United States. [Formerly LAS 260] Immigration of Latin American and Caribbean peoples to the United States and their experiences in this country. Required service work and a research project in the Nashville Latino community. [3] (P)

LAS 3851. Independent Study. [Formerly LAS 289A] A program of independent readings or research to be selected in consultation with the center's undergraduate adviser. Open only to juniors and seniors. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of LAS 3851 and 3852] (No AXLE credit)

LAS 3852. Independent Study. [Formerly LAS 289B] A program of independent readings or research to be selected in consultation with the center's undergraduate adviser. Open only to juniors and seniors. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of LAS 3851 and 3852] (No AXLE credit)

LAS 3880. Internship Training. [Formerly LAS 280B] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Latin America. Background reading and research will be completed in Latin American Studies 3881 concurrently with the completion of internship training, Latin American Studies 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, 6 hours of prior work in Latin American Studies, and prior approval of the director of undergraduate studies of the student's plans are required. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 cannot be included in the minimum number of hours counted toward the Latin American Studies major or minor. Corequisite: 3881. [1-9] (No AXLE credit)

LAS 3881. Internship Readings and Research. [Formerly LAS 280A] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Latin America. Background reading and research will be completed in Latin American Studies 3881 concurrently with the completion of internship training, Latin American Studies 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, 6 hours of prior work in Latin American Studies, and prior approval of the director of undergraduate studies of the student's plans are required. Corequisite: 3880. [3-6] (No AXLE credit)

LAS 3891. Special Topics in Latin American Studies. [Formerly LAS 294A] Selected special topics suitable for interdisciplinary examination from the perspective of the social sciences and humanities. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

LAS 4550. Gender, Sexuality, and Family in Latin America. Evolution of Latin American identity over time. [3] (INT)

LAS 4901. Research Seminar. [Formerly LAS 290] Selected topics for the interdisciplinary study of Latin America. [3] (No AXLE credit)

Latino and Latina Studies

LATS 2201. Introduction to Latino and Latina Studies. [Formerly LATS 201] Foundational course for interdisciplinary study of Americans of Hispanic heritage and their communities. History and cultural production. Interconnections and differences among diverse Hispanic communities. [3] (P)

LATS 3831. Latino and Latina Business and Entrepreneurship. [Formerly LATS 250] Research on Nashville's growing Latino and Latina communities. Types of businesses and how they function. Issues affecting businesses within the communities. Work with local community leaders. A service learning course. [3] (SBS)

LATS 3850. Independent Study. 1-3 credits per semester; maximum of 12 credits total for four semesters of LATS 3850. [1-3] (No AXLE credit)

LATS 3880. Internship Training. Under faculty supervision, students can gain experience in a variety of settings relative to the Latinx experience. A research paper must be submitted. Normally, a 2.7 GPA, 6 hours of prior work in LATS, and prior approval of a specific plan by the director of the LATS program are required. [1-9] (No AXLE credit)

LATS 3881. Internship Readings and Research. Under faculty supervision, students can gain internship experience relative to the Latinx experience. Hours earned based upon readings and research supervised by LATS faculty to lend intellectual foundation to the internship experience. A research paper must be submitted at the end of the semester during which the internship is completed. [3-6] (No AXLE credit)

LATS 4961. Latino and Latina Studies Seminar. [Formerly LATS 280] Overview of cultural production, history, and political and socioeconomic experiences of Hispanic people living in the United States. Synthesis of issues, traditions, approaches, and problems. [3] (HCA)

Managerial Studies

MGRL 1001. Commons iSeminar. [Formerly MGRL 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

MGRL 1100. Fundamentals of Management. [Formerly MGRL 194] Entrepreneurship, strategy, marketing, operations, and finance. For-profit, non-profit, and social enterprise organizations. [3] (SBS)

MGRL 1200. Fundamentals of Marketing. [Formerly MGRL 190] Creating customer value and building profitable customer relationships. Understanding customer needs, defining target markets, and crafting value propositions. Case studies. Not intended for students pursuing the undergraduate business minor; students who complete BUS 2600 forfeit credit for 1200. [3] (SBS)

MGRL 2200. Data Analysis and Presentation. Collection, structure, and analysis of data. Quantitative problem solving using spreadsheets. Design strategy and principles for communication of results. Prerequisite: One of BME 3200, ECON 1500, ECON 1510, MATH 1011, MATH 2810, MATH 2820, MATH 2821, PSY 2100, PSY-PC 2110, or SOC 2100. [3] (SBS)

MGRL 2300. Entrepreneurship: The Business Planning Process. [Formerly MGRL 196] Functional areas within companies, business plans at various stages of company development, and critique of business plans for investment suitability. Prerequisites: both 1100 and either FNEC 1600 or FNEC 1605; or BUS 2100. [3] (SBS)

MGRL 3105. Negotiation. [Formerly MGRL 185] Contemporary challenges in leading change in organizations and building effective management teams. The context and dynamics of negotiation; components, structure, and management of negotiations; and varying requirements across the spectrum of negotiation types. [3] (SBS)

MGRL 3110. Business Management. Seminar. Analysis of cases representing strategic decisions in operations, resource management, competitive balance, and product and service offerings. Prerequisite: BUS 2100 or FNEC 1600 and BUS 2600 or MGRL 1100 or MGRL 1200 or MGRL 3250. [3] (SBS)

MGRL 3200. Advanced Marketing. [Formerly MGRL 191] Case study of processes, techniques, and theories of marketing, including branding, advertising, interactive media, sales promotion, and marketing research. Offered on a graded basis only. Prerequisite: MGRL 1200 or BUS 2600. [3] (SBS)

MGRL 3250. Corporate Strategy. [Formerly MGRL 198] Examination of the issues and challenges facing corporate management. Responsibilities and interrelationships of functional areas including marketing, finance, operations, and R&D. Industry, competitor, and customer analysis. Design and implementation of corporate strategy. Informational and control systems. Interpersonal skills for effective teamwork. Prerequisite: FNEC 1600. [3] (SBS)

MGRL 3255. Corporate Strategy. Elective intended for business minor. Relationship between organizational structure and strategy. Decision structures to achieve performance objectives. Analysis of team, competitor, and market issues and dynamics. Prerequisite: BUS 2100. [3] (SBS)

MGRL 3300. Entrepreneurial Challenge. [Formerly MGRL 195] Simulation of the entrepreneurial experience from idea generation to funding. Development of a complete business plan, including financial projections, and competition for funding from investors. Offered on a graded basis only. Prerequisite: 1100 or BUS 2100. [3] (SBS)

MGRL 3841. Directed Study. [Formerly MGRL 290] Directed readings and related field research toward a scholarly project conceived and executed under the supervision of a faculty member. Limited to juniors and seniors. [3] (No AXLE credit)

MGRL 3851. Independent Study in Managerial Studies. [Formerly MGRL 245] A program of independent reading in consultation with an adviser. Written permission of an instructor and the program director required. [Variable credit: 1-3; may not be repeated] (No AXLE credit)

Mathematics

MATH 1001. Commons iSeminar. [Formerly MATH 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

MATH 1005. Pre-calculus Mathematics. [Formerly MATH 133] Inequalities, functions and graphs, trigonometric identities, theory of equations. Designed for students who plan to take either 1200-1201 or 1300-1301 but need a stronger background in algebra and trigonometry. [3] (No AXLE credit)

MATH 1010. Probability and Statistical Inference. [Formerly MATH 127A] For students not planning to major in science, engineering, or mathematics. Discrete and continuous probability models (exponential, binomial, Poisson, normal). Law of large numbers; conditional probability and Bayes theorem; counting techniques and combinatorics. Descriptive statistics: measures of central tendency and dispersion, histograms. [3] (No AXLE credit)

MATH 1011. Probability and Statistical Inference. [Formerly MATH 127B] For students not planning to major in science, engineering, or mathematics. Linear regression, correlation, hypothesis testing. Confidence intervals, sampling distributions, statistical inference. Prerequisite: 1010. [3] (MNS)

MATH 1100. Survey of Calculus. [Formerly MATH 140] A basic course in the rudiments of analytic geometry and differential and integral calculus with emphasis on applications. Designed for students who do not plan further study in calculus. Not open to students who have earned credit for MATH 1200, 1201, or 1300 without permission. Total credit for this course and MATH 1200 will not exceed 4 credit hours; Total credit for this course and MATH 1300 will not exceed 5 credit hours; Total credit for this course and MATH 1201 will not exceed 6 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [4] (MNS)

MATH 1111. First-Year Writing Seminar. [Formerly MATH 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

MATH 1200. Single-Variable Calculus I. [Formerly MATH 150A] Review of algebra and trigonometry. Exponential functions; inverse functions and logarithms. Limits; differentiation of algebraic and transcendental functions; rules of differentiation; related rates. Three hours of lecture and one hour of recitation period per week. Not open to students who have earned credit for MATH 1100 or 1300 without permission. Total credit for this course and MATH 1100 will not exceed 4 credit hours; Total credit for this course and MATH 1300 will not exceed 5 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (MNS)

MATH 1201. Single-Variable Calculus II. [Formerly MATH 150B] Maximum and minimum values; curve sketching. Antiderivatives; the Fundamental Theorem of Calculus; areas and volumes; techniques of integration. Three hours of lecture and one hour of recitation period per week. Students who have earned credit for 1100 or 1301 will earn only two credits for this course. Not open to students who have earned credit for MATH 1100, 1300, or 1301 without permission. Total credit for this course and MATH 1100 or 1301 will not exceed 6 credit hours; Total credit for this course and MATH 1300 will not exceed 5 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1200. [3] (MNS)

MATH 1300. Accelerated Single-Variable Calculus I. [Formerly MATH 155A] Functions, limits, differentiation of algebraic functions, integration, applications including extrema problems, areas, volumes, centroids, and work. Not open to students who have earned credit for MATH 1100, 1200, or 1201 without permission. Total credit for this course and MATH 1100, 1200, or 1201 will not exceed 5 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [4] (MNS)

MATH 1301. Accelerated Single-Variable Calculus II. [Formerly MATH 155B] Differentiation and integration of transcendental functions, applications, methods of integration, coordinate geometry, polar coordinates, infinite series. Not open to students who have earned credit for MATH 1201 without permission. Total credit for this course and MATH 1201 will not exceed 6 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1300 or 1201. [4] (MNS)

MATH 2300. Multivariable Calculus. [Formerly MATH 175] Vectors, curves, and surfaces in space. Functions of several variables, partial derivatives, multiple integrals. Vector integral calculus, including line and surface integrals. Not open to students who have earned credit for MATH 2310, 2500, or 2501 without permission. Total credit for this course and MATH 2310 or 2501 will not exceed 4 credit hours; total credit for this course and MATH 2500 will not exceed 5 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1301 or 2200. [3] (MNS)

MATH 2310. Multivariable Calculus with Matrix Algebra. Vectors and matrix operations. Linear transformations, dimension, and rank. Solutions of systems of linear equations. Eigenvalues and eigenvectors. Lines, planes, and subspaces. Limits, continuity, and the derivative of functions of several variables and vector-valued functions. Extremum and constrained optimization. Multiple integrals and change of variables. Applications to probability and statistics. Not open to students who have earned credit for MATH 2300, 2400, 2410, 2500, 2501, or 2600 without permission. Total credit for this course and MATH 2300, 2400, 2500, or 2501 will not exceed 4 credit hours; total credit for this course and MATH 2410 or 2600 will not exceed 6 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1301. [4] (MNS)

MATH 2400. Differential Equations with Linear Algebra. [Formerly MATH 196] Scalar differential equations, Laplace transforms, systems of differential equations. Gauss-elimination, algebra of matrices, determinants, vector spaces, linear operators, eigenvalues and eigenvectors. Intended for

students in Biomedical Engineering, Electrical Engineering and Computer Engineering. Not open to students who have earned credit for MATH 2310, 2410, 2420, 2500, 2501, or 2610 without permission. Total credit for this course and MATH 2310, 2410, 2420, 2500, 2501, or 2610 will not exceed 4 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: 2300. [4] (No AXLE credit)

MATH 2410. Methods of Linear Algebra. [Formerly MATH 194] Vectors and matrix operations. Linear transformations and fundamental properties of finite dimensional vector spaces. Solutions of systems of linear equations. Eigenvalues and eigenvectors. Not open to students who have earned credit for MATH 2310, 2400, 2500, 2501, or 2600 without permission. Total credit for this course and MATH 2310 will not exceed 6 credit hours; total credit for this course and MATH 2400 or 2501 will not exceed 4 credit hours; total credit for this course and MATH 2500 will not exceed 5 credit hours; total credit for this course and MATH 2600 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: 2300. [3] (MNS)

MATH 2420. Methods of Ordinary Differential Equations. [Formerly MATH 198] Linear first-order differential equations, applications, higher order linear differential equations, complementary and particular solutions, applications, Laplace transform methods, series solutions, numerical techniques. Not open to students who have earned credit for MATH 2400 or 2610 without permission. Total credit for this course and MATH 2400 will not exceed 4 credit hours; total credit for this course and MATH 2610 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 2300, 2310, or 2501. [3] (MNS)

MATH 2500. Multivariable Calculus and Linear Algebra. [Formerly MATH 205A] Vector algebra and geometry; linear transformations and matrix algebra. Real and complex vector spaces, systems of linear equations, inner product spaces. Functions of several variables and vector-valued functions: limits, continuity, the derivative. Extremum and nonlinear problems, manifolds. Multiple integrals, line and surface integrals, differential forms, integration on manifolds, theorems of Green, Gauss, and Stokes. Eigenvectors and eigenvalues. Emphasis on rigorous proofs. Not open to students who have earned credit for MATH 2300, 2310, 2400, 2410, or 2600 without permission. Total credit for this course and MATH 2300 or 2410 will not exceed 5 credit hours; total credit for this course and MATH 2310 or 2400 will not exceed 4 credit hours; total credit for this course and MATH 2600 will not exceed 6 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Open only to first-year students with a test score of 5 on the Calculus-BC Advanced Placement examination. [4] (MNS)

MATH 2501. Multivariable Calculus and Linear Algebra. [Formerly MATH 205B] Continuation of 2500. Vector algebra and geometry; linear transformations and matrix algebra. Real and complex vector spaces, systems of linear equations, inner product spaces. Functions of several variables and vector-valued functions: limits, continuity, the derivative. Extremum and nonlinear problems, manifolds. Multiple integrals, line and surface integrals, differential forms, integration on manifolds, theorems of Green, Gauss, and Stokes. Eigenvectors and eigenvalues. Emphasis on rigorous proofs. Not open to students who have earned credit for MATH 2300, 2310, 2400, 2410, or 2600 without permission. Total credit for this course and MATH 2300, 2310, 2400, 2410, or 2600 will not exceed 4 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 2500 and first-year standing. [4] (MNS)

MATH 2600. Linear Algebra. [Formerly MATH 204] Algebra of matrices, real and complex vector spaces, linear transformations, and systems of linear equations. Eigenvalues, eigenvectors, inner product spaces, and orthonormal bases. Designed primarily for mathematics majors. Not open to students who have earned credit for MATH 2310, 2410, 2500, or 2501 without permission. Total credit for this course and MATH 2410 will not exceed 3 credit hours; total credit for this course and MATH 2310 or 2500 will not exceed 6 credit hours; total credit for this course and MATH 2500 will not exceed 5 credit hours; total credit for this course and MATH 2501 will not exceed 4 credit hours. Credit hours reduced from second course taken

(or from test or transfer credit) as appropriate. Prerequisite or corequisite: 2300 or 2310. [3] (MNS)

MATH 2610. Ordinary Differential Equations. [Formerly MATH 208] First- and second-order differential equations, applications. Matrix methods for linear systems; stability theory of autonomous systems; existence and uniqueness theory. Intended for mathematics and advanced science majors. Not open to students who have earned credit for MATH 2400 or 2420 without permission. Total credit for this course and MATH 2400 will not exceed 4 credit hours; total credit for this course and MATH 2420 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: concurrent enrollment in 2501; or prior credit for either 2501 or both 2300 or 2310 and either 2410 or 2600. [3] (MNS)

MATH 2810. Probability and Statistics for Engineering. [Formerly MATH 216] Discrete and continuous probability functions, cumulative distributions. Normal distribution. Poisson distribution and Poisson process. Conditional probability and Bayes' formula. Point estimation and interval estimation. Hypothesis testing. Covariance and correlation. Linear regression theory and the principle of least squares. Monte Carlo methods. Intended for students in Electrical Engineering and Computer Engineering. Not open to students who have earned credit for MATH 2820 without permission. Total credit for this course and MATH 2820 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 2300, 2310, or 2501. [3] (No AXLE credit)

MATH 2820. Introduction to Probability and Mathematical Statistics. [Formerly MATH 218] Discrete and continuous probability models, mathematical expectation, and joint densities. Laws of large numbers, point estimation, and confidence intervals. Hypothesis testing and applications. Students taking 2820 are encouraged to take 2820L concurrently. Not open to students who have earned credit for MATH 2810 without permission. Total credit for this course and MATH 2810 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 2300, 2310, or 2501. [3] (MNS)

MATH 2820L. Statistics Laboratory. [Formerly MATH 218L] Applications of the theory developed in 2820. Emphasis on data analysis and interpretation. Topics include the one- and two-sample problems, paired data, correlation and regression, chi-square, and model building. Pre- or corequisite: 2810 or 2820. [1] (No AXLE credit)

MATH 2821. Introduction to Applied Statistics. [Formerly MATH 219] Review of basic applied statistics. Analysis of variance as a technique for interpreting experimental data. Generalized likelihood ratio principle, confounding, multiple comparisons, introduction to response surface methodology, and nonparametric methods. Experimental designs: completely randomized, nested, orthogonal contrasts, randomized block, Latin squares, factorial, and fractional factorial. Prerequisite: 2810 or 2820. [3] (MNS)

MATH 3000. History of Mathematics. [Formerly MATH 252] Major developments in mathematics from ancient times to the early twentieth century. Emphasis both on the historical perspective and the mathematics; assignments include many exercises and theorems. Highly recommended for teacher candidates. Prerequisite: 2501 or both 2300 (or 2310) with either 2410 or 2600. [3] (MNS)

MATH 3010. Intensive Problem Solving and Exposition. [Formerly MATH 200] Intended to develop widely-applicable mathematical skills. Basic principles such as induction, the pigeonhole principle, symmetry, parity, and generating functions. Prerequisite: 2300, 2310, or 2500. [3] (MNS)

MATH 3100. Introduction to Analysis. [Formerly MATH 260] Properties of real numbers, compactness and completeness. Limits, sequences and series, uniform convergence, and power series. Basic properties of functions on the real line, and the elementary theory of differentiation and integration. Emphasis on methods of proof used in advanced mathematics courses. Prerequisite: 2501 or both 2300 (or 2310) with either 2410 or 2600. [3] (MNS)

MATH 3110. Complex Variables. [Formerly MATH 261] Complex numbers, analytic and elementary functions, transformations of regions. Complex integrals, Cauchy's integral theorem and formula, Taylor and Laurent

series. The calculus of residues with applications, conformal mappings. Prerequisite: 2300, 2310, or 2501. [3] (MNS)

MATH 3120. Introduction to Partial Differential Equations. [Formerly MATH 234] Initial- and boundary-value problems for partial differential equations using separation of variables in conjunction with Fourier series and integrals. Explicit solutions of problems involving the heat equation, the wave equation, and Laplace's equation. Prerequisite: Either 2410, 2600, or 2501 and either 2400, 2420, or 2610. [3] (MNS)

MATH 3130. Fourier Analysis. [Formerly MATH 263] Fourier series topics including convolution, Poisson kernels, Dirichlet kernels, and pointwise and mean-square convergence. Integral transforms including one-dimensional and multidimensional Fourier integrals, Fourier inversion formula and Plancherel theorem, Poisson summation formula, Radon transform, and X-ray transform. Fourier analysis on Abelian groups including finite Fourier analysis and fast Fourier transform. Applications to signal processing, Shannon sampling theory, and/or compressed sensing. Prerequisite: Either 2501; or both 2300 (or 2310) with either 2410 or 2600. [3] (MNS)

MATH 3200. Introduction to Topology. [Formerly MATH 242] Open sets, closed sets, continuity, compactness, and connectivity. Subspaces, product spaces, and quotient spaces. Knot theory, topology of surfaces, and applications. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3210. Transformation Geometry. [Formerly MATH 240] Transformations of the plane, groups of transformations, reflections, glide reflections, classification of the isometries of the plane, frieze groups, analysis of frieze patterns, wall paper groups, and analysis of wall paper patterns. Especially recommended for prospective teachers of mathematics. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3230. Introduction to Differential Geometry. Smooth maps, tangent space, and surfaces and hypersurfaces in n -dimensional Euclidean space. Inverse and Implicit Function theorems. Sard's theorem. Transversality. Degree of a map; intersection theory modulo 2. Orientability and oriented intersection number. Prerequisite: 2501 or both 2300 and either 2410 or 2600. [3] (MNS)

MATH 3300. Abstract Algebra. [Formerly MATH 223] Fundamental properties of integers and polynomials. Elementary properties of groups, rings, integral domains, fields, and lattices. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3310. Introduction to Mathematical Logic. [Formerly MATH 250] Development of the first order predicate calculus and fundamental metamathematical notions. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3320. Error-Correcting Codes and Cryptography. [Formerly MATH 253] Applications of algebra to reliability and secrecy of information transmission. Error-correcting codes, including linear, Hamming, and cyclic codes, and possibly BCH or Reed-Solomon codes. Cryptography, including symmetric-key, DES and RSA encryption. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3600. Advanced Engineering Mathematics. [Formerly MATH 229] Vector analysis including directional derivatives, transformation of coordinates, divergence and curl. Line integrals, surface integrals, and divergence theorem. Stokes' theorem. Functions of a complex variable, including limits, derivatives, and Cauchy-Riemann equations. Exponential, trigonometric, hyperbolic, and logarithmic functions. Complex integrals, Cauchy's integral theorem and formula. Taylor and Laurent series. Calculus of residues. Prerequisite: 2400, 2420, or 2610. [3] (MNS)

MATH 3620. Introduction to Numerical Mathematics. [Formerly MATH 226] Numerical solution of linear and nonlinear equations, interpolation and polynomial approximation, non-numerical differentiation and integration. Least-squares curve fitting and approximation theory, numerical solution of differential equations, errors and floating point arithmetic. Application of the theory to problems in science, engineering, and economics. Student use of the computer is emphasized. Familiarity with computer programming is expected. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

MATH 3630. Mathematical Modeling in Biology and Medicine. [Formerly MATH 262] Basic mathematical modeling tools, such as interpola-

tion, least-squares regression, difference equations, and ordinary and partial differential equations. Statistical analysis of data, support vector machines, and computer simulation. Familiarity with computer programming is expected. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

MATH 3640. Probability. [Formerly MATH 247] Combinatorics, probability models (binomial, Poisson, normal, gamma, etc.), Stochastic independence, generating functions, limit theorems and types of convergence, bivariate distributions, transformations of variables. Markov processes and applications. Prerequisite: 2810 or 2820. Co-requisite 2410, 2501, or 2600 [3] (MNS)

MATH 3641. Mathematical Statistics. [Formerly MATH 248] Distribution theory, order statistics, theory of point estimation and hypothesis testing, normal univariate inference, Bayesian methods, sequential procedures, regression, nonparametric methods. Students interested in applications may take 2820L. Prerequisite: 3640. [3] (MNS)

MATH 3650. Introduction to Financial Mathematics. [Formerly MATH 246A] Theory of interest including time value of money, annuities, rates of return, yield curves, and immunization. Pricing of financial instruments including annuities, bonds, stocks, and derivatives using arbitrage-free assumptions. Foundational for actuarial science. Prerequisite: 2300, 2310, or 2501. Corequisite: 2810, 2820, or 3640. [3] (MNS)

MATH 3651. Actuarial Models. [Formerly MATH 246B] Probabilistic analysis of insurance. Single-life models, including time-value of benefits, life annuities, premiums, and benefit reserves: Multiple-decrement models; Multiple-life models. Probabilistic topics: Markov chains and Poisson processes. Prerequisite: 3650 and either 2810, 2820 or 3640. [3] (MNS)

MATH 3660. Mathematical Modeling in Economics. [Formerly MATH 256] Modeling microeconomic problems of supply and demand, profit maximization, and Nash equilibrium pricing. Auctions and bargaining models. Statistical models and data analysis. Computational experiments. Prerequisite: 2300, 2310, or 2501. [3] (MNS)

MATH 3670. Mathematical Data Science. Linear methods for regression and classification, bias-variance tradeoff, and basis expansions and regularization. Kernel methods, support vector machines, dimension reduction, and clustering algorithms. Serves as repeat credit for MATH 3890-01 in Fall 2017. Prerequisite: one of 2810, 2820, or 3641; and one of 2410, 2501, or 2600. [3] (MNS)

MATH 3700. Discrete Mathematics. [Formerly MATH 215] Elementary combinatorics including permutations and combinations, the principle of inclusion and exclusion, and recurrence relations. Graph theory including Eulerian and Hamiltonian graphs, trees, planarity, coloring, connectivity, network flows, some algorithms and their complexity. Selected topics from computer science and operations research. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3800. Theory of Numbers. [Formerly MATH 221] Factorization of integers, Fundamental Theorem of Arithmetic, congruences, Wilson's theorem. Fermat's theorem, arithmetic functions, perfect numbers, Law of Quadratic Reciprocity. Diophantine equations, Pythagorean triples, sums of squares. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 3859. Independent Study. [Formerly MATH 298] Reading and independent study in mathematics under the supervision of an adviser. Designed primarily for honors candidates, but open to others with approval by department chair. [Variable credit: 1-3 each semester, not to exceed 6 without departmental permission] (No AXLE credit)

MATH 3890. Selected Topics for Undergraduates. [Formerly MATH 267] Topics vary. May be repeated for a total of 12 credits in 3890 and 3895 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2501; or both 2300 (or 2310) with either 2410 or 2600. [1-3; maximum of 12 credits total for all semesters of MATH 3890 and 3895 combined] (No AXLE credit)

MATH 4110. Partial Differential Equations. [Formerly MATH 294] Classification of equations: equations of elliptic, parabolic, and hyperbolic type. Separation of variables, orthonormal series, solutions of homogeneous and nonhomogeneous boundary value problems in one-, two-, and

three-dimensional space. Possible additional topics include subharmonic functions and the Perron existence theorem for the Laplace equation of Sturm-Liouville theory. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

MATH 4200. Topology. [Formerly MATH 272A] Connectedness, compactness, countability, and separation axioms. Complete metric spaces. Function spaces. Prerequisite: 2501, 3200, or 4220. [3] (MNS)

MATH 4201. Topology. [Formerly MATH 272B] The fundamental group and covering spaces. Topology of surfaces. Simplicial complexes and homology theory. Homotopy theory. Prerequisite: 4200. [3] (MNS)

MATH 4300. Modern Algebra. [Formerly MATH 283A] Group theory through Sylow theorems and fundamental theorem of finitely generated abelian groups. Prerequisite: 3300. [3] (MNS)

MATH 4301. Modern Algebra. [Formerly MATH 283B] Introductory theory of commutative rings and fields, and additional topics such as Galois theory, modules over a principal ideal domain and finite dimensional algebras. Prerequisite: 4300. [3] (MNS)

MATH 4310. Set Theory. [Formerly MATH 280] The basic operations on sets. Cardinal and ordinal numbers. The axiom of choice. Zorn's lemma, and the well-ordering principle. Introduction to the topology of metric spaces, including the concepts of continuity, compactness, connectivity, completeness, and separability. Product spaces. Applications to Euclidean spaces. Strongly recommended for beginning graduate students and for undergraduates who plan to do graduate work in mathematics. Prerequisite: 2501; or both 2300 (or 2310) with either 2410 or 2600. [3] (MNS)

MATH 4320. Lattice Theory and the Theory of Ordered Sets. [Formerly MATH 284] An introduction to basic concepts and theorems in lattice theory and the theory of ordered sets with connections to universal algebra and computer science. Boolean algebras, modular and distributive lattices, ordered topological spaces, algebraic lattices and domains, fixed point theorems, cosets, free lattices. Prerequisite: 3300. [3] (MNS)

MATH 4600. Numerical Analysis. [Formerly MATH 286] Finite difference and variational methods for elliptic boundary value problems, finite difference methods for parabolic and hyperbolic partial differential equations, and the matrix eigenvalue problem. Student use of the computer is emphasized. Prerequisite: 3620. [3] (MNS)

MATH 4610. Methods of Mathematical Physics. [Formerly MATH 292] Linear operators on vector spaces, matrix theory, and Hilbert spaces. Functions of a complex variable and calculus of residues. Ordinary and partial differential equations of mathematical physics, boundary value problems, special functions. Prerequisite: Either 2410, 2600, or 2501, and either 2400, 2420, or 2610. [3] (MNS)

MATH 4620. Linear Optimization. [Formerly MATH 288] An introduction to linear programming and its applications. Formulation of linear programs. The simplex method, duality, complementary slackness, dual simplex method and sensitivity analysis. The ellipsoid method. Interior point methods. Possible additional topics include the primal-dual algorithm, cutting planes, or branch-and-bound. Applications to networks, management, engineering, and physical sciences. Prerequisite: either 2410, 2600, or 2501, and either CS 1101 or 1103. [3] (MNS)

MATH 4630. Nonlinear Optimization. [Formerly MATH 287] Mathematical modeling of optimization problems. Theory of unconstrained and constrained optimization, including convexity and the Karush-Kuhn-Tucker conditions. Derivative- and non-derivative-based methods. Familiarity with computer programming is expected. Prerequisite: 2501; or both 2300 (or 2310) and either 2410 or 2600. [3] (MNS)

MATH 4650. Financial Stochastic Processes. [Formerly MATH 249A] The theory of stochastic processes and applications to financial economics. Brownian motion; martingales; Itô's Lemma; stochastic integration. Monte Carlo simulations with variance reduction techniques. Applications include discrete time option pricing and delta hedging. Prerequisite: 3650 and either 2810, 2820, or 3640. [3] (MNS)

MATH 4651. Evaluation of Actuarial Models. [Formerly MATH 249B] Applications of statistics to the evaluation and selection of actuarial models. Severity, frequency, and aggregate models. Measure of risk. Applications

of Bayesian analysis to credibility theory. Simulation and bootstrap methods. Prerequisite: 3651, 3641, and 4650. [3] (MNS)

MATH 4700. Combinatorics. [Formerly MATH 274] Elements of enumerative analysis including permutations, combinations, generating functions, recurrence relations, the principle of inclusion and exclusion, and Polya's theorem. Some special topics will be treated as class interest and background indicate (e.g., Galois fields, theory of codes, and block designs). Students unfamiliar with permutations, combinations, and basic counting techniques should take 3700 prior to 4700. Prerequisite: 2410, 2600, or 2501. [3] (MNS)

MATH 4710. Graph Theory. [Formerly MATH 275] The mathematical theory of networks. Traversing graphs using paths, cycles, and trails. Matchings and other graph factors. Coloring of vertices and edges. Connectivity and its relation to paths and flows. Embeddings of graphs in surfaces, especially the plane. Prerequisite: linear algebra. Students unfamiliar with basic ideas of graph theory, including paths, cycles, and trees, should take 3700 prior to 4710. [3] (MNS)

MATH 4999. Senior Thesis. [Formerly MATH 269] A written presentation of research results, original for the student but not usually original in the larger sense. The regulations governing the writing of a master of arts thesis in mathematics will apply to the writing of the senior thesis. [3] (No AXLE credit)

Medicine, Health, and Society

MHS 1001. Commons iSeminar. [Formerly MHS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

MHS 1111. First-Year Writing Seminar. [Formerly MHS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

MHS 1500. Introduction to Microbiology. [Formerly NURS 1500] Diversity of bacteria and viruses. Genetics and metabolism of bacteria. Pathogenesis, host immune defense mechanisms, rationale for antimicrobial drugs. Bacteria, fungi, viruses, and parasites important to humans. No credit for students who have earned credit for NURS 1500. [3-4] (MNS)

MHS 1600. Introduction to Nutrition and Health for a Changing World. [Formerly NURS 1600] Nutrition science and research; basic principles of digestion and absorption; role of specific nutrients and dietary practices in health promotion and chronic disease prevention. Nutrition throughout the lifespan. Not intended for students who have previously taken NURS 1601 or NURS 1602. [3] (MNS)

MHS 1920. Politics of Health. [Formerly MHS 170] Sociocultural analysis of the conflicts, definitions, inequalities, and structures of power that influence health. [3] (P)

MHS 1930. Social Dimensions of Health and Illness. [Formerly MHS 201] Multidisciplinary introduction to health conditions from perspectives of anthropology, economics, history, political science and policy studies, philosophy, religious studies, and sociology. Guest lectures by representatives of various disciplines. [3] (P)

MHS 1940. Racial and Ethnic Health Disparities. [Formerly MHS 180] Relationship between health outcomes and race and ethnicity. Historical and contemporary factors influencing differences in health outcomes, including mental health, HIV/AIDS, and other chronic diseases. Explanations of health disparities and of strategies to reduce them. [3] (SBS)

MHS 1950. Theories of the Body. Interdisciplinary study of the human body through critical theory, history, philosophy, art, and popular culture. How cultural understandings of bodies reflect broader social, political, scientific, and legal regimes. [3] (HCA)

MHS 1960. Health Humanities. Cultural, political, and material aspects of human health through novels, memoirs, articles, poems, and films. Serves

as repeat credit for students who have earned credit for MHS 3890-04 offered spring 2019 and fall 2018. [3] (HCA)

MHS 2110. American Medicine and the World. [Formerly MHS 208] Social foundations of medical authority. Health disparities in the United States and abroad. Effects of social settings of medical research, evaluation, and treatment on health outcomes. Inequalities in medical knowledge and institutions. [3] (P)

MHS 2120. Health Social Movements. [Formerly MHS 210] Health inequality and inequity based on race, ethnicity, gender, class, and sexuality. Issues related to access to health care services. Crusades for certain diseases, illness experiences, and disabilities. Challenging science on etiology, diagnosis, treatment, and prevention. [3] (P)

MHS 2130. Social Movements and Community Action. [Formerly MHS 211] The literature of social activism. How citizens individually and collectively accomplish and resist social change. Historical and contemporary health movements as case studies to illustrate the advantages and limitations of social change strategies. [3] (SBS)

MHS 2150. Medical Humanities. [Formerly MHS 248] Conceptual and creative analysis of philosophy, literature, art, and music to identify and account for human nature in the medical context. Ethical, practical, and social management of medical technology. Theories of art, music, and literature to understand human creativity and self-explanation in the face of illness and difference. [3] (HCA)

MHS 2230. Masculinity and Men's Health. [Formerly MHS 232] Interdisciplinary approach to men's health issues and to perceptions of masculinity. The history of men's diseases. Men in clinical settings. Social policies that affect men's health behaviors. [3] (P)

MHS 2240. Bionic Bodies, Disability Cultures. [Formerly MHS 242] Historical and cultural evolution of prosthetics, artificial limbs, and other assistive technologies. Shifts in social views resulting from war, economics, and art and design. [3] (HCA)

MHS 2250. War and the Body. [Formerly MHS 212] Impact of war on the human body. Anthropology of the body and theories of bodily experience. Production, representation, and experience of war and of military and medical technologies on a bodily level. Acceptable and unacceptable types of harm. [3] (P)

MHS 2310. Chinese Society and Medicine. [Formerly MHS 231] Medicine and health in contemporary China. Social organization of medical care, social determinants of health and disease, social construction of health and disease, and health-related social problems. [3] (SBS)

MHS 2320. Medicine, Law, and Society. [Formerly MHS 244] Survey of issues in medicine and law, including the physician-patient relationship, medical malpractice, organ donation, healthcare financing, and the limits and powers of the government to protect the public's health. [3] (SBS)

MHS 2330. Men's Health Research and Policy. [Formerly MHS 234] Concepts and theories of men's health. Global and domestic issues. Effect of men's social and economic advantages on health outcomes. Strategies to improve men's health; relationships between cultural values and health policy; and cultural explanations that shape men's health campaigns. [3] (SBS)

MHS 2350. Italian Representations of Wellness and Illness. From 1300 to the present. Depictions of health and sickness in Italian literature, art, and film. Historical, cultural, and social dimensions of health in Italy and changes in the societal approach to health. Italian society's views on health, wellness, and the stigmatization of physical and mental illness. [3] (INT)

MHS 2410. HIV/AIDS in the Global Community. [Formerly MHS 236] Medical, social, political, economic, and public policy dimensions of HIV/AIDS. Prevention and treatment strategies, social stigma, and discrimination. [3] (P)

MHS 2420. Economic Demography and Global Health. [Formerly MHS 206] Economic consequences of demographic change in developing and developed countries. Links between socioeconomic status and health; relationship between health and economic growth; determinants of fertility, mortality, and migration. [3] (SBS)

MHS 2430. Social Capital and Health. [Formerly MHS 240] Theoretical approaches to social capital and their applications to the social production of disease and illness. Theoretical background of social capital; the conceptualization and measurement of social capital; and the multiple roles of social capital as a social antecedent of health. [3] (SBS)

MHS 2510. Caring for Vulnerable Populations. [Formerly MHS 237] Humanitarian aid and the risks and responsibilities in providing for vulnerable populations. Differences between acute and chronic crises. Geopolitical, cultural, clinical, and practical factors. [3] (No AXLE credit)

MHS 2520. Autism in Context. [Formerly MHS 250] Multiple manifestations. Impact, questions, and debates. Familial, educational, sociological, legal, and medical contexts. [3] (SBS)

MHS 2610. Global Health Crises. Development of global health priorities, responses to emerging crises, and unintended consequences of global health interventions. [3] (INT)

MHS 2920. Medicine on Trial. Medicine as an object of dispute and a source of evidence in courts of law. Key cases and issues in Western law. Medicine adjudicated in religious, military, tribal, national, and international courts. [3] (SBS)

MHS 2940. Race, Citizenship, and Health. Social and historical impacts of immigration, settlement, nation formation, labor exploitation, imperialism, and globalization on populations categorized as victims, vectors of disease, or sanitary citizens. Health as a key site in which the meaning of race and citizenship are developed and navigated. [3] (P)

MHS 2950. Healing Animals. Animals as subjects of medical research and as patients in veterinary medicine. Health of animals as friends, food, entertainment, and vectors of disease. Celebration and concealment of the centrality of animals in modern medicine through legal, economic, social, and emotional techniques. [3] (P)

MHS 3000. Undergraduate Seminar. [Formerly MHS 295] Advanced reading, research, and writing. Topics vary. Limited to juniors and seniors with preference to majors in Medicine, Health, and Society. May be repeated for credit once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Offered on a graded basis only. [3; maximum of 6 credits total for all semesters of MHS 3000] (No AXLE credit)

MHS 3010. Global Health Principles and Practice. Introduction to major global health principles and practices in the developing and developed world. Perspectives of public health practitioners and critical thinking about global health challenges and solutions. [3] (P)

MHS 3020. U.S. Public Health Ethics and Policy. [Formerly MHS 203] Critical perspectives on ethical and policy issues in U.S. public health. [3] (P)

MHS 3030. Community Health Research. [Formerly MHS 235] Conceptual and methodological challenges. Focus on descriptive studies and intervention research to address health disparities in chronic diseases and psychiatric disorders. [3] (SBS)

MHS 3040. Designing Healthy Publics. Politics of public health and the built environment in U.S. cities from the nineteenth century to the present. Critical perspectives on health promotion, research, and design. Nashville as a case study. [3] (US)

MHS 3050W. Medicine and Literature. [Formerly MHS 205W] Narrative analysis, and other humanistic, interpretative practices of relevance to medicine and health. [3] (HCA)

MHS 3101. Human Anatomy and Physiology I. [Formerly NURS 3101] Structure and function of the human organism. Integration of the gross anatomical structures and organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Clinical relevance of selected topics. One semester of a college-level course in biology or chemistry is expected. [4] (MNS)

MHS 3102. Human Anatomy and Physiology II. [Formerly NURS 3102] Continuation of 3101. Structure and function of the human organism. Integration of the gross anatomical structures and organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Clinical relevance of selected topics. [4] (MNS)

MHS 3110. Global Health and Social Justice. [Formerly MHS 204] Global health institutions, policies, and practices. Issues of social justice. Anthropological, sociological, and scientific studies that address the social, moral, political and economic factors influencing the definition of and response to global health problems. [3] (P)

MHS 3120. Medicine, Technology, and Society. [Formerly MHS 245] Tensions between art and science in medicine. The effect of science and technology on the doctor-patient relationship. Social and ethical issues raised by new biomedical developments. Repeat credit for students who completed 295 section 1 in fall 2009. [3] (No AXLE credit)

MHS 3140. Afrofuturism and Cultural Criticisms of Medicine. [Formerly MHS 216] Exploration of Afrofuturism as a literary genre and its critique of the impact of techno-science and medicine on black health, life, and futurity. Multidisciplinary approach in understanding novels, memoirs, and secondary texts. No credit for students who earned credit for 290 section 3 in fall 2013. [3] (HCA)

MHS 3150. Death and Dying in America. [Formerly MHS 225] Interdisciplinary introduction to thanatology; changes in medicine and attitudes towards dying as they reshape the American way of death in a multicultural landscape. [3] (P)

MHS 3210. Health, Development, and Culture in Guatemala. [Formerly MHS 281A] Social dimensions of health in Guatemalan communities. History, culture, and political economy. Spanish language skills strongly recommended. Instructor consent required. [3] (INT)

MHS 3212. Health, Development, and Culture in Guatemala. [Formerly MHS 218B] Social and political dimensions of health and development in Guatemala through fieldwork and service learning in rural Maya communities in Quetzaltenango and Sololá. Prerequisite: 3210. [1-3] (No AXLE credit)

MHS 3220. Healthcare Organizations. [Formerly MHS 222] Key healthcare organizations in the context of policies governing the U.S. healthcare system. How organizations and policies shape the meaning of health and the dynamics of medical encounters. [3] (SBS)

MHS 3250. Perspectives on Trauma. [Formerly MHS 254] Trauma as a framework for understanding individual and collective suffering. Trauma in the context of medicine, war, and politics, and of racial, sexual, and gender inequalities. Alternative ways of conceptualizing feeling, memory and loss. [3] (SBS)

MHS 3310. Healthcare Systems Comparisons. [Formerly MHS 256] Maymester. Travel to France and Italy. Comparison of US healthcare system to universal healthcare systems. On-site healthcare facilities visits. Role of government, insurance coverage and financing, strategies, quality of care, disparities, care coordination, electronic health records, costs, innovations and reforms. Taught in English. Offered on a graded basis only. [3] (INT)

MHS 3320. Introduction to U.S. Health Care Policy. Key features of U.S. health care system. Financing and delivery; historical trends; and comparisons to other countries. Methods of health policy evaluation. [3] (SBS)

MHS 3350. Medicine, Religion, and Spirituality. [Formerly MHS 246] How individuals, families, and communities deal with such life events as birth, serious illness and injury, disability, war, and death through the combined belief in medicine and religion. Sources include fiction, poetry, drama, film, and texts. Research seminar. [3] (No AXLE credit)

MHS 3450. Mental Illness Narratives. Mental illness experiences through memoir, film, and spoken word. Serves as repeat credit for MHS 3890 Section 01 in Spring 2017. [3] (P)

MHS 3830. Service Learning. [Formerly MHS 294A] Under faculty supervision, students will design a program of community service associated with a set of learning objectives. The service component (3830) should benefit both the recipient and the provider of the service, offering the latter opportunities for self-reflection, self-discovery, and the development of values, skills, and knowledge. A central objective must be firsthand experience of a central issue or issues studied in sociology, psychology, political science, economics, or another academic discipline. The MHS program will work to find placements for interested students. The other component,

3831, will consist of an independent study in the relevant discipline and must be closely linked to the issue(s) addressed in 3830. For example, a student may provide services to the elderly in nursing homes and use 3831 to study how state and federal policies affect the delivery of health care and other services to nursing home populations. To be accepted, students must have a 2.90 overall grade point average and 6 hours of prior work in approved MHS courses. They must submit a specific plan for the service-learning experience to the MHS program director. Must be taken Pass/Fail and concurrently with 3831. These hours shall not be included in the minimum hours required for the MHS major or minor. After completing the experience, all students must write a thorough report. Corequisite: 3831. [1-3] (No AXLE credit)

MHS 3831. Service Learning Research and Readings. [Formerly MHS 294B] Under faculty supervision, students will design a program of community service associated with a set of learning objectives. The service component (3830) should benefit both the recipient and the provider of the service, offering the latter opportunities for self-reflection, self-discovery, and the development of values, skills, and knowledge. A central objective must be firsthand experience of a central issue or issues studied in sociology, psychology, political science, economics, or another academic discipline. The MHS program will work to find placements for interested students. The other component—3831—will consist of an independent study in the relevant discipline and must be closely linked to the issue(s) addressed in 3830. For example, a student may provide services to the elderly in nursing homes and use 3831 to study how state and federal policies affect the delivery of health care and other services to nursing home populations. To be accepted, students must have a 2.90 overall grade point average and 6 hours of prior work in approved MHS courses. They must submit a specific plan for the service-learning experience to the MHS program director. Students will write a substantial research or interpretative paper under the supervision of a Vanderbilt faculty member on a topic related to their service learning experience. Corequisite: 3830. [1-3] (No AXLE credit)

MHS 3850. Independent Study. [Formerly MHS 296] A program of reading and/or research in one area of MHS studies to be selected in consultation with an adviser. Normally limited to qualified MHS minors or majors. Approval of faculty adviser and MHS program director required for enrollment. May be repeated for credit once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. (However, students in the MHS honors program may count a total of 12 hours in MHS 3850, including the 6 hours in the senior year devoted to preparation of the honors thesis. The same instructor will ordinarily supervise work on the honors thesis in both fall and spring semesters; a student may work with a thesis adviser who has previously supervised an independent study with that student.) [1-3; maximum of 6 credits for all semesters of MHS 3850; maximum of 12 credits for students in the MHS honors program] (No AXLE credit)

MHS 3880. Internship Training. [Formerly MHS 293A] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs devoted to health care, public health, health-related policy and research. Two options are available. (1) Full-time: 12-15 hours total, including 6-9 hours in 3880, and 6 hours in 3881. (2) Part-time: 2-9 hours total, including 1-6 hours in 3880 and 1-3 hours in 3881. To be accepted for either option, students must have a 2.90 grade point average and 6 hours of prior work in approved MHS courses; they must submit a specific plan for the internship to the MHS program director. After completing the internship, all students must write a thorough report. Note: All work for an internship must be completed during a single semester or summer. Must be taken Pass/Fail and concurrently with 3881. These hours shall not be included in the minimum hours required for the MHS major or minor. Corequisite: 3881. [Variable credit: 1-9] (No AXLE credit)

MHS 3881. Internship Readings and Research. [Formerly MHS 293B] Under faculty supervision, students from any discipline can gain experience in a broad range of public and private agencies, institutions, and programs devoted to health care, public health, health-related policy and research. Two options are available. (1) Full-time: 12-15 hours total, including 6-9 hours in 3880, and 6 hours in 3881. (2) Part-time: 2-9 hours total, including 1-6 hours in 3880 and 1-3 hours in 3881. To be accepted for either option,

students must have a 2.90 grade point average and 6 hours of prior work in approved MHS courses; they must submit a specific plan for the internship to the MHS program director. After completing the internship, all students must write a thorough report. Note: All work for an internship must be completed during a single semester or summer. Students will write a substantial research or interpretative paper under the supervision of a regular Vanderbilt faculty member. Corequisite: 3880. [Variable credit: 1-6] (No AXLE credit)

MHS 3890. Special Topics. [Formerly MHS 290] May be repeated for credit twice if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1-3; maximum of 9 credits total for all semesters of MHS 3890] (No AXLE credit)

MHS 4010. Psychiatry, Culture, and Globalization. [Formerly MHS 252] Cross-cultural analysis of mental illness; the emergence of cultural psychiatry; and the globalization of biopsychiatry and neuroscience. [3] (P)

MHS 4050. Narrative and Medicine: Stories of Illness and the Doctor-Patient Relationship. [Formerly MHS 220] Use of classical and contemporary illness narratives to understand the doctor-patient relationship. Focus on patient stories in clinical settings. [3] (HCA)

MHS 4998. Honors Research. [Formerly MHS 297] Offered on a graded basis only. Limited to seniors admitted to the departmental honors program. [3] (No AXLE credit)

MHS 4999. Honors Thesis. [Formerly MHS 298] Offered on a graded basis only. Limited to seniors admitted to the departmental honors program. [3] (No AXLE credit)

Military Science

MS 1510. American Military History: Principles of War. [Formerly MS 151] Offered on a graded basis only. [3]

Naval Science

NS 1100. Introduction to Naval Science (Navy and Marine option). [Formerly NS 100] No Credit Toward Current Degree. [3]

NS 1300. Naval Operations (Navy option). [Formerly NS 130] No Credit Toward Current Degree. [3]

NS 2410. Organization and Management (Navy and Marine option). [Formerly NS 241] [3]

NS 2420. Leadership and Ethics (Navy and Marine option). [Formerly NS 242] No Credit Toward Current Degree. [3]

Neuroscience

NSC 1001. Commons iSeminar. [Formerly NSC 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

NSC 2060. Elective (Cellular and Molecular). [Formerly 71AT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Cellular and Molecular elective.

NSC 2065. Elective (Systems and Integrative). [Formerly 72AT] This course has no Vanderbilt equivalent. Credit is eligible to count toward the Systems and Integrative elective.

NSC 2201. Neuroscience. [Formerly NSC 201] Physiology of nerve cells, sensory and motor systems, sleep, speech, and sexual behavior. Clinical topics include the chemical basis of psychosis, diseases of the brain, and repair mechanisms after brain injury. [3] (MNS)

NSC 2222. Classical Neuroscience. History of key concepts in modern neuroscience, their context and impact through the original scientific articles that introduced them, with emphasis in their application in furthering oral and writing science communication skills. [3] (MNS)

NSC 3235. Biological Basis of Mental Disorders. [Formerly NSC 235] Cellular and molecular neuropathology of cortical dysfunction resulting from

affective disorders, drug addiction, neurodegenerative disease, and stroke. Prerequisite: 2201. [3] (MNS)

NSC 3240. Neurobiology of Addiction. Neural basis of the regulation and dysregulation of reward processing. Pathophysiology of addiction. Serves as repeat credit for NSC 3891 Section 01 in Spring 2016. Prerequisite: 2201. [3] (MNS)

NSC 3245. Drug Discovery for Neuropsychiatric Disorders. Discovery and development of novel medicines for neurological and psychiatric illness. History of drug discovery, target identification and validation, and medicinal chemistry. In vitro high-throughput screening, drug metabolism, and pharmacokinetics. Prerequisite: 2201. [3] (MNS)

NSC 3260. Psychopharmacology. [Formerly NSC 260] Actions of therapeutic drugs for psychiatric disorders and of drugs of abuse. Molecular mechanisms of effects on perception, cognition, and emotion. Serves as repeat credit for NSC 3630 or PSY 3630. Prerequisite: 2201. [3] (MNS)

NSC 3269. Developmental Neuroscience. [Formerly NSC 269] Normal and abnormal brain development. Cell division, migration, and death; synapse formation and plasticity; and clinical syndromes. Prerequisite: 2201. [3] (MNS)

NSC 3270. Computational Neuroscience. [Formerly NSC 270] Theoretical, mathematical, and simulation models of neurons, neural networks, or brain systems. Computational approaches to analyzing and understanding data such as neurophysiological, electrophysiological, or brain imaging. Demonstrations simulating neural models. Prerequisite: 2201, either CS 1101 or 1103, and either MATH 1200 or 1300. [3] (MNS)

NSC 3272. Structure and Function of the Cerebral Cortex. [Formerly NSC 272] Classic and current concepts of cerebral function. Species differences, receptive field organization, neurotransmitters, modifications by experience, and behavioral effects. Prerequisite: 2201. [3] (MNS)

NSC 3274. Neuroanatomy. [Formerly NSC 274] Functional and comparative anatomy of nervous systems, emphasis on vertebrate brains. Fundamental concepts, organizational principles, structure, connectivity, and how these relate to function and behavior. Demonstrations using plates with human brain sections. Offered on a graded basis only. Prerequisite: 2201. [3] (MNS)

NSC 3630. Drugs and Behavior. [Formerly PSY 261] Drug effects on neural circuits, human physiology, individual psychology, and society. Serves as repeat credit for students who have earned credit for NSC 3260 or PSY 3630. Prerequisite: 1200 or NSC 2201. [3] (SBS)

NSC 3851. Independent Reading in Neuroscience. [Formerly NSC 291] Reading and discussion of research papers on a selected topic under direction of a faculty sponsor. Consent of both faculty sponsor and the director of honors and independent study is required. May be repeated for credit once if there is no duplication in topic, but students may earn only up to 1 credit per semester of enrollment. [1; maximum of 2 credits for all semesters of NSC 3851] (No AXLE credit)

NSC 3860. Introduction to Neuroscience Research. [Formerly NSC 190] Research and reading in the laboratory of a member of the Neuroscience Program. Consent of the Director of Honors and Independent Research is required. Serves as repeat credit for students who have completed 290. [1] (No AXLE credit)

NSC 3861. Undergraduate Research. [Formerly NSC 292A] Original student research on a defined problem in neuroscience under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of honors and independent studies is required. Prerequisite: 3860 or both 2201 and sophomore standing. [2] (No AXLE credit)

NSC 3862. Undergraduate Research. [Formerly NSC 292B] Continuation of 3861. Original student research on a defined problem in neuroscience under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of honors and independent studies is required. Prerequisite: 3861. [2] (No AXLE credit)

NSC 3863. Advanced Research in Neuroscience. [Formerly NSC 293A] Original student research on a defined problem in neuroscience under the direction of a faculty sponsor with some independence in the design and

execution of the project. Consent of both the faculty sponsor and the director of honors and independent studies is required. Prerequisite: 3862. [3] (No AXLE credit)

NSC 3864. Advanced Research in Neuroscience. [Formerly NSC 293B] Continuation of a research project on a defined problem in neuroscience under the direction of a faculty sponsor with some independence in the design and execution of the project. Consent of both the faculty sponsor and the director of honors and independent studies is required. May be taken for credit more than once, but students may earn only up to 3 credits per semester. Prerequisite 3863. [3] (No AXLE credit)

NSC 3891. Special Topics in Cellular and Molecular Neuroscience. [Formerly NSC 285] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2201. [3] (MNS)

NSC 3892. Special Topics in Systems and Integrative Neuroscience. [Formerly NSC 287] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 2201. [3] (MNS)

NSC 4961. Integrative Neuroscience. [Formerly NSC 255] Structure and function of nervous systems. Emphasis on the vertebrate brain and the relationship of anatomy, physiology, and biochemistry to sensory perception, cognition, motor activity, and learning and memory. Prerequisite: 2201 and senior standing. [3] (MNS)

NSC 4969. Senior Seminar in Neuroscience. [Formerly NSC 299] Seminar with advanced reading, discussion, and writing on a specific topic in neuroscience. Limited to seniors. [3] (No AXLE Credit)

NSC 4999. Honors Research. [Formerly NSC 296] Participation in a research project under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of honors and independent study is required. May be repeated for credit more than once, but students may earn only up to 4 credits per semester of enrollment. [2-4] (No AXLE credit)

Philosophy

PHIL 1001. Commons iSeminar. [Formerly PHIL 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

PHIL 1002. Introduction to Philosophy. [Formerly PHIL 100] An introduction to the basic problems of philosophy based upon readings in the works of selected leading philosophers. Repeat credit for students who have completed 1002W. [3] (HCA)

PHIL 1002W. Introduction to Philosophy. [Formerly PHIL 100W] An introduction to the basic problems of philosophy based upon readings in the works of selected leading philosophers. Repeat credit for students who have completed 1002. [3] (HCA)

PHIL 1003. General Logic. [Formerly PHIL 102] A study of the uses of language, definition, informal fallacies, the theory of the syllogism, the basic operations of modern symbolic logic, and selected issues in inductive logic and scientific method. Emphasis is placed on the ambiguities and pitfalls of ordinary usage and on techniques for translating ordinary arguments into formal logic. [3] (MNS)

PHIL 1004. Introduction to Asian Philosophy. [Formerly PHIL 103] Philosophical thought of Asian origin, especially India and China, from ancient times to the present, theoretical and practical concerns. Repeat credit for students who have completed 1004W. [3] (INT)

PHIL 1004W. Introduction to Asian Philosophy. [Formerly PHIL 103W] Philosophical thought of Asian origin, especially India and China, from ancient times to the present, theoretical and practical concerns. Repeat credit for students who have completed 1004. [3] (INT)

PHIL 1005. Introduction to Ethics. [Formerly PHIL 105] A study of theories of the good life and of the nature of virtue. Readings in major texts and discussion of selected problems. [3] (P)

PHIL 1008. Introduction to Medical Ethics. [Formerly PHIL 108] Moral issues in the practice of medicine, biomedical research, policies and regu-

lations related to health care. Repeat credit for students who have completed 1008W. [3] (P)

PHIL 1008W. Introduction to Medical Ethics. [Formerly PHIL 108W] Moral issues in the practice of medicine, biomedical research, policies and regulations related to health care. Repeat credit for students who have completed 1008. [3] (P)

PHIL 1100. Introduction to Business Ethics. [Formerly PHIL 110] Ethical issues arising from business and professional practice. Topics will include: corporate social responsibility, employee rights, technology and privacy in the workplace, corporate governance, and globalization. [3] (P)

PHIL 1111. First-Year Writing Seminar. [Formerly PHIL 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

PHIL 1200. The Meaning of Life. [Formerly PHIL 120] Accounts of life's meaning. The relations between ways of living, happiness, and the fact of death. The individual's role in giving meaning to life. Readings from Mill, Tolstoy, Kierkegaard, and several contemporary thinkers. Repeat credit for students who have completed 1200W. [3] (HCA)

PHIL 1200W. The Meaning of Life. [Formerly PHIL 120W] Accounts of life's meaning. The relations between ways of living, happiness, and the fact of death. The individual's role in giving meaning to life. Readings from Mill, Tolstoy, Kierkegaard, and several contemporary thinkers. Repeat credit for students who have completed 1200. [3] (HCA)

PHIL 2100. Ancient Philosophy. [Formerly PHIL 210] An examination of the major Greek and Roman philosophers with emphasis on the works of Plato and Aristotle. [3] (HCA)

PHIL 2101. Hellenistic and Late Ancient Philosophy. [Formerly PHIL 218] Philosophical ideas of Stoics, Cynics, Epicureans, skeptics, Peripatetics, Neoplatonists, and early monotheist thinkers such as Philo, Origen, and Philoponus. [3] (HCA)

PHIL 2102. Medieval Philosophy. [Formerly PHIL 211] Comparative study of key figures in Islamic, Jewish, and Christian philosophy as they struggle with the philosophy of logic, metaphysics, language, culture, politics, ethics, and nature. [3] (INT)

PHIL 2103. Modern Philosophy. [Formerly PHIL 212] An examination of the major philosophers of modern Europe from Descartes and Spinoza through Locke, Berkeley, Hume, and Kant. [3] (HCA)

PHIL 2104. Nineteenth-Century Philosophy. [Formerly PHIL 228] A study of selected themes and writings from nineteenth-century European philosophers. [3] (INT)

PHIL 2109. Twentieth-Century Continental Philosophy. [Formerly PHIL 260] A study of selected twentieth-century philosophers such as Derrida, Foucault, and Lacan. [3] (HCA)

PHIL 2110. Contemporary Philosophy. [Formerly PHIL 213] An examination of selected problems treated in recent philosophical literature such as meaning, perception, knowledge, truth, and freedom. Readings from the Anglo American analytical and the phenomenological traditions. [3] (HCA)

PHIL 2660. Philosophy of Music. [Formerly PHIL 249] Music and meaning, language, emotion, expression, interpretation, performance, the body, and politics. No musical background is required. [3] (HCA)

PHIL 2661. Philosophy of Sport. Philosophical examination of sports, athletics, games, and play. Fairness, competition, cheating, aesthetics, embodiment, and doping. Role models, gender, exploitation, luck, and sports ethics. [3] (P)

PHIL 2665. Race and Racism. Race and related concepts, including ethnicity, caste, class, gender, nation, and intersectionality. Discrimination, xenophobia, prejudice, bias, oppression, and privilege. [3] (P)

PHIL 3003. Formal Logic and Its Applications. [Formerly PHIL 202] A self-contained course designed to convey an understanding of the

concepts of modern formal logic, to develop convenient techniques of formal reasoning, and to make some applications of them in one or more of the following: psychology, linguistics, structuralist studies, information and computer sciences, and the foundations of mathematics. Philosophy 1003 is not required. [3] (MNS)

PHIL 3004. Advanced Asian Philosophy. [Formerly PHIL 203] Classical Asian philosophical texts. Historical development of practices and ideas; translation and interpretation issues; comparisons with European and other traditions of thought. [3] (INT)

PHIL 3005. Jewish Philosophy. [Formerly PHIL 261] Introduction to Jewish philosophy and the philosophical achievement of such major figures as Philo, Saadia, Maimonides, Levinas, and selected contemporary thinkers. [3] (HCA)

PHIL 3006. Islamic Philosophy. [Formerly PHIL 262] Introduction to the major figures of Islamic philosophy including Kindi, Razi, Farabi, Avicenna, and Ibn Khaldun. [3] (INT)

PHIL 3007. French Feminism. [Formerly PHIL 263] Introduction to the tradition of French feminist philosophy, including relevant works by Beauvoir, Cixous, Irigaray, Kristeva, LeDoeuff, Kofmann, and others. [3] (No AXLE credit)

PHIL 3008. American Philosophy. [Formerly PHIL 222] A study of the works of selected American philosophers from the colonial period to the present. [3] (US)

PHIL 3009. Existential Philosophy. [Formerly PHIL 224] A study of two or three existential philosophers and selected problems that arise in relation to their thought. [3] (HCA)

PHIL 3010. Phenomenology. [Formerly PHIL 226] Selected readings from such thinkers as Husserl, Sartre, and Merleau-Ponty on the structures of experience, the sources and limits of knowledge, mind, and body, interpersonal relations, and the meaning of freedom. [3] (HCA)

PHIL 3011. Critical Theory. [Formerly PHIL 232] The Frankfurt School; mass culture, ideology, and modernism in the arts; the disenchantment of reason; alienation and fascism; the prospects for experience and political critique. Readings include Adorno, Horkheimer, Marcuse, Benjamin, and Habermas. [3] (HCA)

PHIL 3012W. Writing as Political Resistance. [Formerly PHIL 233W] Writings from the political margins from authors under house arrest, in exile, or in prison. Expressions of active resistance to oppressive, and occasionally violent, political institutions. [3] (P)

PHIL 3013. History of Aesthetics. [Formerly PHIL 240] History of philosophy of art, aesthetic experience, creativity, criticism, and related concepts. [3] (HCA)

PHIL 3014. Modernistic Aesthetics. [Formerly PHIL 241] Abstraction, nontraditional media, mixed media, new media, changes in artistic institutions, and the death of art. [3] (HCA)

PHIL 3103. Immanuel Kant. [Formerly PHIL 220] Kant's revolutionary critique of the foundations of human knowledge, moral obligation, and religious faith, with readings from his three Critiques and lesser works. [3] (HCA)

PHIL 3104. Kierkegaard and Nietzsche. [Formerly PHIL 247] A study of selected works. [3] (HCA)

PHIL 3105. Hegel. Selected works and themes. Experience, reason, freedom, history, and sociality. Modernity, dialectics, religion, and art. [3] (HCA)

PHIL 3600. Philosophy of Knowledge. [Formerly PHIL 216] Nature, sources, and scope of scientific, moral, and religious belief. Justification, knowledge, and skeptical challenges to their legitimacy. [3] (HCA)

PHIL 3601. Metaphysics. [Formerly PHIL 217] Selected problems in metaphysics such as ultimate explanation, meaning of existence, time and eternity, freedom and determinism, and science and religion. [3] (HCA)

PHIL 3602. Philosophy of History. [Formerly PHIL 231] Focus on alternative conceptions of time and history in Aristotle, Augustine, Kant, Hegel, Heidegger, and Benjamin. [3] (HCA)

PHIL 3603. Philosophy of Education. [Formerly PHIL 234] Analysis of educational concepts. Educational implications of theories of knowledge and theories of the individual. Emphasis on higher education. [3] (HCA)

PHIL 3604. Gender and Sexuality. [Formerly PHIL 235] Recent theories of the relation between sex, gender, and sexuality. Construction of gendered identities, and their relation to embodiment, gender politics, ethics and epistemology. [3] (P)

PHIL 3605. Contemporary Ethical Theory. [Formerly PHIL 238] A study of theories about the cognitive foundations of ethical discourses. Prerequisite: 1005. [3] (HCA)

PHIL 3606. Moral Problems. [Formerly PHIL 239] A discussion of specific moral problems such as the justification of abortion and euthanasia. Moral theories such as utilitarianism will be discussed, but the emphasis will be on their relevance to the solution of moral problems. Repeat credit for students who have completed 3606W. Prerequisite: 1005. [3] (P)

PHIL 3606W. Moral Problems. [Formerly PHIL 239W] A discussion of specific moral problems such as the justification of abortion and euthanasia. Moral theories such as utilitarianism will be discussed, but the emphasis will be on their relevance to the solution of moral problems. Repeat credit for students who have completed 3606. Prerequisite: 1005. [3] (P)

PHIL 3607. Philosophy of Religion. [Formerly PHIL 242] A study of various problems concerning religious experiences; ideas about religion and divinity. [3] (HCA)

PHIL 3608. Ethics and Medicine. [Formerly PHIL 270] Selected ethical issues raised by clinical practice, medical theories, and biomedical research and technology. Not open to students who have earned credit for PHIL 1111-03 without permission. Total credit for this course and PHIL 1111-03 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1005, 1008, or 1008W. [3] (P)

PHIL 3609. Ethics and Business. [Formerly PHIL 271] Moral problems in the business world including irresponsible marketing, conflict between profit and social conscience, resource use, public regulation of business, and the value of competition. Prerequisite: 1005. [3] (P)

PHIL 3610. Ethics and Law. [Formerly PHIL 272] Moral problems in the practice of law including conflicts of interest, confidentiality, limits of advocacy, and the obligations of lawyers to clients, courts, and the public. Repeat credit for students who have completed 3610W. Prerequisite: 1005. [3] (SBS)

PHIL 3610W. Ethics and Law. [Formerly PHIL 272W] Moral problems in the practice of law including conflicts of interest, confidentiality, limits of advocacy, and the obligations of lawyers to clients, courts, and the public. Repeat credit for students who have completed 3610. Prerequisite: 1005. [3] (SBS)

PHIL 3611. Environmental Philosophy. [Formerly PHIL 273] Environmental ethics (animal rights, respect for nature, the land ethic), science and the natural world, the aesthetics of nature, global justice, and sustainability. [3] (P)

PHIL 3612. Ethics and Animals. [Formerly PHIL 274] Ethical issues raised by human interactions with animals, including laboratory experiments, factory farming, hunting, zoos, and pet ownership. Challenges to ethical theory provoked by extending rights to animals. [3] (HCA)

PHIL 3615. Philosophy of Film. [Formerly PHIL 243] Challenges posed by film forms to traditional aesthetics and the novel philosophical approaches created to deal with them. Topics include the nature of the film image, film and experiential time, cinematic genres, the problem of mass art, and feminist critiques of spectatorship. Weekly screenings. [3] (HCA)

PHIL 3616. Philosophy and the Natural Sciences. [Formerly PHIL 244] Philosophical issues in the methodology, conceptual structure, patterns of explanation, historical development, and cultural impact of the natural sciences. Metaphysical and ethical implications. [3] (P)

PHIL 3617. Philosophy of Language. [Formerly PHIL 246] Philosophical problems in the methodology of linguistics, relations between thought and

language, theories of meaning and symbolism, the nature of metaphor, the philosophical implications of theories of language acquisition. [3] (SBS)

PHIL 3618. Philosophy and Literature. [Formerly PHIL 248] Philosophical topics in novels or poetry. Examples include: meaning of life, linguistic meaning, good and evil, aesthetic value, and human freedom. Repeat credit for students who have completed 3618W. [3] (HCA)

PHIL 3618W. Philosophy and Literature. [Formerly PHIL 248W] Philosophical topics in novels or poetry. Examples include: meaning of life, linguistic meaning, good and evil, aesthetic value, and human freedom. Repeat credit for students who have completed 3618. [3] (HCA)

PHIL 3620. Political and Social Philosophy. [Formerly PHIL 252] Central issues and arguments concerning individual liberty, political authority, democracy, and justice. Key texts and arguments. Contemporary debates. [3] (P)

PHIL 3621. Early Modern Political Philosophy. [Formerly PHIL 257] A study of competing accounts of the best form of political association, which differ from Locke, through the works of Machiavelli, Hobbes, Spinoza, and Rousseau. [3] (INT)

PHIL 3622. Contemporary Political Philosophy. [Formerly PHIL 258] A focused and extended examination of selected topics in contemporary political theory, such as justice, liberty, rights, tolerance, and autonomy. Content varies depending on instructor. [3] (P)

PHIL 3623. Modern Philosophies of Law. [Formerly PHIL 254] Contemporary theories of legal validity, legal liability (criminal and civil), and contractual obligation with special attention to the controversy between legal positivism and "natural law" theories and the assessment of contemporary economic analyses of legal rights. [3] (SBS)

PHIL 3630. Philosophy of Mind. [Formerly PHIL 256] Selected problems in the philosophy of mind. Relation between mind and body, the nature of consciousness, the problem of other minds, the status of self-knowledge, and the possibility of machine and other intelligence. Connections with empirical investigations in related cognitive disciplines. [3] (SBS)

PHIL 3657. Humanity, Evolution, and God. [Formerly PHIL 245] The impact of the idea of evolution on our conception of personhood. Theistic and non-theistic approaches to philosophical anthropology, ethics and society, the theory of knowledge, the mind-body problem, and relations with the environment and other species. [3] (P)

PHIL 3661. Topics in Aesthetics. [Formerly PHIL 251] Philosophy of art and aesthetic theory. [3] (HCA)

PHIL 3851. Independent Readings. [Formerly PHIL 289A] Designed for majors not in the departmental honors program. Consists of a project to be carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [1-6; maximum of 12 credits total for four semesters of PHIL 3851 and 3852] (No AXLE credit)

PHIL 3852. Independent Readings. [Formerly PHIL 289B] Designed for majors not in the departmental honors program. Consists of a project to be carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 12 credits in 3851 and 3852 combined over a four semester period if there is no duplication in topic, but students may earn only up to 6 credits per semester of enrollment. [1-6; maximum of 12 credits total for four semesters of PHIL 3851 and 3852] (No AXLE credit)

PHIL 3891. Selected Topics. [Formerly PHIL 294A] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

PHIL 3892. Selected Topics. [Formerly PHIL 294B] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit) (No AXLE credit)

PHIL 4999. Honors Independent Study. [Formerly PHIL 295] Designed for students in the Honors Program in philosophy. Consists of guided

reading, periodic reports, and work on honors thesis. May be repeated for credit once, but students may earn only up to 6 credits per semester of enrollment. [3-6; maximum of 12 credits total for all semesters of PHIL 4999] (No AXLE credit)

Physics

PHYS 1001. Commons iSeminar. [Formerly PHYS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

PHYS 1010. Introductory Physics. [Formerly PHYS 110] Normally accompanied by 1010L. Motion, forces, conservation laws, light, heat, and electricity. Quantum theory, the atomic nucleus, elementary particles, and properties of materials. Special relativity, Big Bang, and cosmology. Primarily intended for those who do not expect to major in science. [3] (MNS)

PHYS 1010L. Introductory Physics Laboratory. [Formerly PHYS 111] Laboratory to accompany 1010. Corequisite: 1010. One three-hour laboratory per week. Satisfies the AXLE lab course requirement when completed with 1010. [1] (No AXLE credit)

PHYS 1111. First-Year Writing Seminar. [Formerly PHYS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

PHYS 1501. Introductory Physics for the Life Sciences I. [Formerly PHYS 113A] Normally accompanied by 1501L. Calculus-based introduction to physics taught within the context of life science applications. Mechanics, fluids, sound, thermal, and statistical physics. Prospective majors are strongly advised to take Math 1300 or a higher level calculus course. Prior study of calculus or concurrent enrollment in Math 1100, 1200, or 1300 is expected. Serves as repeat credit for PHYS 1601. Not open to students who have earned credit for 1901 without permission. Credit for this course and 1901 will not exceed 5 credit hours. [3] (MNS)

PHYS 1501L. Laboratory for Introductory Physics for the Life Sciences I. [Formerly PHYS 114A] Laboratory to accompany Physics 1501. Normally accompanied by 1501. Satisfies the AXLE lab course requirement when completed with 1501 (strongly preferred) or 1601. Serves as repeat credit for PHYS 1601L. Not open to students who have earned credit for 1901 without permission. Credit for this course and 1901 will not exceed 5 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [1] (No AXLE credit)

PHYS 1502. Introductory Physics for the Life Sciences II. [Formerly PHYS 113B] Normally accompanied by 1502L. Calculus-based introduction to physics taught within the context of life science applications. Electricity and magnetism; geometric and physical optics; atomic, nuclear, and quantum physics. Prospective majors are strongly advised to take Math 1301 or a higher level calculus course. Prior study of calculus or concurrent enrollment in Math 1100, 1201, or 1301 is expected. Serves as repeat credit for PHYS 1602. Not open to students who have earned credit for 1902 without permission. Credit for this course and 1902 will not exceed 5 credit hours. [3] (MNS)

PHYS 1502L. Laboratory for Introductory Physics for the Life Sciences II. [Formerly PHYS 114B] Laboratory to accompany Physics 1502. Normally accompanied by 1502. Satisfies the AXLE lab course requirement when completed with 1502 (strongly preferred) or 1602. Serves as repeat credit for PHYS 1602L. Not open to students who have earned credit for 1902 without permission. Credit for this course and 1902 will not exceed 5 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [1] (No AXLE credit)

PHYS 1601. General Physics I. [Formerly PHYS 116A] Normally accompanied by 118a. Calculus-based introduction to general physics and its applications. Mechanics, heat, and sound. Potential majors are strongly advised to take MATH 1300 or a higher level calculus course. Prior study of calculus or concurrent enrollment in MATH 1200 or 1300 is expected. Serves as repeat credit for PHYS 1501. Not open to students who have

earned credit for 1901 without permission. Credit for this course and 1901 will not exceed 5 hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [3] (MNS)

PHYS 1601L. General Physics Laboratory I. [Formerly PHYS 118A] Laboratory to accompany Physics 1601. Normally accompanied by 1601. Satisfies the AXLE lab course requirement when completed with 1601 (strongly preferred) or 1501. Serves as repeat credit for PHYS 1501L. Not open to students who have earned credit for 1901 without permission. Credit for this course and 1901 will not exceed 5 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [1] (No AXLE credit)

PHYS 1602. General Physics II. [Formerly PHYS 116B] Normally accompanied by 1602L. Calculus-based introduction to general physics and its applications. Electricity and magnetism, optics, modern physics. Potential majors are strongly advised to take MATH 1301 or a higher level calculus course. Prior study of calculus or concurrent enrollment in MATH 1201 or 1301 is expected. Serves as repeat credit for PHYS 1502. Not open to students who have earned credit for 1902 without permission. Credit for this course and 1902 will not exceed 5 hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [3] (MNS)

PHYS 1602L. General Physics Laboratory II. [Formerly PHYS 118B] Laboratory to accompany Physics 1602. Normally accompanied by 1602. Satisfies the AXLE lab course requirement when completed with 1602 (strongly preferred) or 1502. Serves as repeat credit for PHYS 1502L. Not open to students who have earned credit for 1902 without permission. Credit for this course and 1902 will not exceed 5 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. [1] (No AXLE credit)

PHYS 1911. Principles of Physics I. Classical dynamics, conservation laws, gravitation, wave motion, and thermodynamics. Designed for first-year students who plan to major in physics or in related disciplines. Three lectures and a weekly discussion on modern topics of interest. Not open to students who have earned credit in PHYS 1501, 1601, 1901, or 2051 without permission. Total credit for this course and PHYS 1501, 1601, or 2051 will not exceed 4 credit hours. Total credit for this course and PHYS 1901 will not exceed 5 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. Corequisite: MATH 1301. [4] (MNS)

PHYS 1912. Principles of Physics II. Continuation of 1911. Electromagnetism, optics, relativity, quantum mechanics, and atomic and nuclear physics. Designed for first-year students who plan to major in physics or in related disciplines. Three lectures and a weekly discussion on modern topics of interest. Not open to students who have earned credit in PHYS 1502, 1602, 1902, or 2053 without permission. Total credit for this course and PHYS 1502, 1602, or 2053 will not exceed 4 credit hours. Total credit for this course and PHYS 1902 will not exceed 5 credit hours. Credit reduced from second course taken (or test or transfer credit) as appropriate. Corequisite: MATH 2300 or 2500. [4] (MNS)

PHYS 1912L. Laboratory Skills for Physicists I. Fundamental laboratory skills and techniques. Experimental design, instrumentation, data handling and analysis, documentation, presentation of results. Prerequisite: 1501, 1601, 1911, or 2051. Corequisite: 1502, 1602, 1912, or 2053. [1] (No AXLE credit)

PHYS 2210. Classical and Modern Optics. [Formerly PHYS 221] Geometrical optics, including reflection, refraction, ray tracing, aberrations, and interference. Physical optics, including wave theory, absorption, dispersion, diffraction, and polarization. Properties of light from lasers and synchrotron sources. Photodetectors and optical technology. Prerequisite: either 1502 or 1602 or 1912; and either MATH 1201 or 1301. [3] (MNS)

PHYS 2255. Modern Physics and the Quantum World. Relativity. Experimental basis of quantum physics. Structure of the atom. Wave properties of matter. The hydrogen atom. Atomic and statistical physics. Prerequisite: either 1502, 1602, 1902 (or 1912), or 2053. Corequisite: MATH 2300 or 2500. [3] (MNS)

PHYS 2255L. Laboratory Skills for Physicists II. Fundamental laboratory skills and techniques. Experimental design, instrumentation, data handling and analysis, documentation, presentation of results. Prerequisite:

1502, 1602, 1912, or 2053; and 1912L or one of 1501L or 1601L and one of 1502L or 1602L. Corequisite: 2255 or 3651. [1] (No AXLE credit)

PHYS 2275. Classical Mechanics. Calculus of variations. Lagrangian and Hamiltonian dynamics. Conservation laws. Vector algebra and coordinate transformations. Gravity and potential energy. Free, forced, damped, and nonlinear harmonic oscillations. The anharmonic oscillator and chaos. Orbital and rotational angular momentum. Gravitational and Coulomb central-force problems. Motion in non-inertial reference frames. Coupled oscillators and normal modes. Rigid-body motion. Continuous systems and the wave equation. Serves as repeat credit for PHYS 2270 and 2271. Prerequisite: 2255 or 3651. [3] (MNS)

PHYS 2290. Electricity, Magnetism, and Electrodynamics I. [Formerly PHYS 229A] Electrostatic fields and potentials. Gauss's law. Electrical properties of insulators, semiconductors, and metals. The Lorentz force. Magnetic fields and forces. Electromagnetic induction, Maxwell's equations, and electromagnetic waves. Prerequisite: 2255 or 3651; and either MATH 2400, 2420, or 2610. [3] (MNS)

PHYS 2291. Electricity, Magnetism, and Electrodynamics II. [Formerly PHYS 229B] Electromagnetic waves in dielectrics and conductors. Electromagnetic radiation in waveguide structures. Relativistic electrodynamics. Magnetism as a relativistic phenomenon. Prerequisite: 2290. [3] (MNS)

PHYS 2660. Experimental Nanoscale Fabrication and Characterization. [Formerly PHYS 266] Laboratory course introduction to nanofabrication and characterization. Independent and original research in nanotechnology and nanoscience. Nanomaterials, nanoelectronics, and photonics. Prerequisite: One of 2255 or 3651, and one of 2260 or 2260W; or one of 1501, 1601, 1911, or 2051, and one of CHEM 1602L or MSE 1500. [3] (MNS)

PHYS 2953L. Advanced Physics Laboratory: Introduction to Experimental Research. Fundamental physics experiments and measurements. Statistical analysis of measured data. One laboratory per week. Prerequisite: 2255L, and either 2255 or 3651; or 1912 and either 2255 or 3651; or either 2250W or 2260W. [1] (No AXLE credit)

PHYS 3122. Physics of Living Systems. Physical principles applied to biological phenomena. Development of physical models of biological systems on scales ranging from molecules to organisms. Biological applications of mechanics, thermodynamics, and dynamical systems. Prerequisite: 1502, 1602, 1912, or 2053; and MATH 2400, 2420, or 2610. [3] (MNS)

PHYS 3125. Health Physics. [Formerly PHYS 243] Theory and instrumentation in health physics and radiological physics. Radiation shielding design, methods of external and internal dosimetry, and radiation regulatory issues. Prerequisite: 2255 and either Math 1201 or 1301. [3] (MNS)

PHYS 3200. Statistical Physics. [Formerly PHYS 223] Temperature, work, heat, and the first law of thermodynamics. Entropy and the second law of thermodynamics. Kinetic theory of gases with applications to ideal gases and electromagnetic radiation. Serves as repeat credit for students who have completed 3207. Prerequisite or corequisite: 2270 or 2275. [3] (MNS)

PHYS 3600. Seminar in Presenting Physics Research. [Formerly PHYS 250] Introduction, instruction, and practice in skills for presenting scientific research results. May be repeated for credit once, but students may earn only 1 credit per semester of enrollment and may count only 1 credit toward the major or minor in physics. Prerequisite: major or minor in Physics; and 2255 or 3651. [1] (No AXLE credit)

PHYS 3640. Physics of Condensed Matter. [Formerly PHYS 254] Crystal structure and diffraction. Phonons and lattice vibrations. Free-electron theory of metals. Elementary band theory of solids. Semiconductors. Optical properties of insulators. Applications to solid-state devices, magnetism, and superconductivity. Prerequisite: 2275 and 3200. Corequisite: 2255. [3] (MNS)

PHYS 3645. Radiation Detectors and Measurement. [Formerly PHYS 285] Basic physics principles and applications of radiation detecting instruments, with laboratory exercises. Techniques and instrumentation for nuclear radiation detection and measurements as they relate to health physics (radiation safety) and nuclear physics. Prerequisite: 2255 or 3125. [4] (MNS)

PHYS 3651. Quantum Mechanics I. [Formerly PHYS 251A] Wave-particle duality, indeterminacy, superposition, the Schrödinger equation, angular momentum, the hydrogen atom, and spin and indistinguishability. Prerequisite: 2255; and Mathematics: MATH 2400; or one of (MATH 2410, 2600, 2501) and one of (MATH 2420, 2610). [3] (MNS)

PHYS 3652. Quantum Mechanics II. [Formerly PHYS 251B] Time-independent and time-dependent perturbation theory, matrix theory, scattering, applications to atomic physics, condensed matter physics, and astrophysics. Prerequisite: 2290 and 3651. [3] (MNS)

PHYS 3660. Introduction to Particle Physics. [Formerly PHYS 255] Weak, strong, and electromagnetic forces as evidenced by the interactions of elementary particles. Classification of particles and experimental techniques. Corequisite: 2255 or 3651. [3] (MNS)

PHYS 3790. Computational Physics. Topics in modern physics analyzed exclusively with computer programs. Finite difference approaches to the Schrödinger and Maxwell equations. Solutions of nonlinear equations. Molecular dynamics. Monte Carlo simulations. Growth models and random walks. Serves as repeat credit for PHYS 2237. Prerequisite: Any three of 2255, 2275, 2290, 3200, 3651. [3] (MNS)

PHYS 3820. Methods in Physics Laboratory Teaching. Developing and running physics labs and classroom lecture demonstrations. Understanding safety protocols. Enrollment open only to students who are Secondary Education, Elementary Education, or Education Studies majors, are also either Physics majors or minors, and who have completed any 12 credit hours in satisfaction of requirements for major or minor in Physics. [3] (MNS)

PHYS 3850. Undergraduate Research. Research and scholarly investigation or directed readings in physics under close supervision of sponsoring faculty member. Enrollment by arrangement with sponsoring faculty member and approval of director of undergraduate studies. May be repeated for credit, for a total of no more than 10 total credit hours and for no more than 5 credit hours per semester. [1-5] (No AXLE credit)

PHYS 3890. Selected Topics. [Formerly PHYS 240] Prerequisite or corequisite: either 2250 or 2250W and either 2260 or 2260W. [1-3] (No AXLE credit)

PHYS 4005. Mathematical Methods for Physicists. Linear spaces and operators; matrix algebra; differential equations; Green's function; and complex analysis. Variational calculus; perturbation methods; group theory. Prerequisite: 2275, 2290; and one of MATH 2400, 2420, or 2610. [3] (MNS)

PHYS 4998. Honors Research and Senior Thesis. [Formerly PHYS 296] Independent experimental or theoretical investigations of basic problems in physics under faculty supervision, culminating in a written thesis submitted and an oral defense presented to a departmental faculty examination committee. Required for departmental honors in Physics. Enrollment by arrangement with sponsoring faculty member and approval of director of undergraduate studies. May be repeated for a total of 10 credits, but students may earn only up to 6 credits per semester of enrollment. Prerequisite: major in Physics, junior or senior standing. [1-6] (No AXLE credit)

Political Science

PSCI 1001. Commons iSeminar. [Formerly PSCI 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

PSCI 1100. Introduction to American Government and Politics. [Formerly PSCI 100] A descriptive survey of the constitutional and structural principles, processes, and functions of the American governmental system. [3] (US)

PSCI 1101. Introduction to Comparative Politics. [Formerly PSCI 101] Democracy, communism, and authoritarian rule in developed and developing countries; political institutions and public policy in diverse national settings; principles of comparative analysis. [3] (SBS)

PSCI 1102. Introduction to International Politics. [Formerly PSCI 102] Significant patterns and trends in twentieth- and twenty-first-century world politics: modes of conducting relations among nations, instruments for promoting national and supranational interests, and controls over international

disputes. Emphasis upon episodes throwing light on the causes of war and the conditions of peace. [3] (SBS)

PSCI 1103. Justice. [Formerly PSCI 103] Different understandings of and debates concerning justice. Equality and freedom, individualism and community, diversity, patriotism, and representation. [3] (HCA)

PSCI 1111. First-Year Writing Seminar. [Formerly PSCI 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

PSCI 1150. U.S. Elections. [Formerly PSCI 150] Examination of the presidential and congressional elections. The recruitment of candidates, nomination processes, financing campaigns, media coverage, polling, predictive models, and implications of results. (during presidential election years). [3] (US)

PSCI 2201. Power and Resistance. Modern and contemporary political theories of power and resistance. Disciplinary power, biopower, sovereign power, and economic power. Law, violence, and revolution. [3] (HCA)

PSCI 2202. Ancient Political Thought. [Formerly PSCI 202] Greek and Roman political traditions. Plato, Aristotle, Cicero, and early Christian thinkers. Questions of justice, equality, democracy, and political knowledge. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2203. History of Modern Political Philosophy. [Formerly PSCI 203] Intensive analysis of the principal political philosophers in the modern tradition. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2205. Contemporary Political Theory. [Formerly PSCI 205] Debates in contemporary political thought. Justice, democracy, freedom, identity, and individualism. Includes emerging contemporary theories. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2207. Liberalism and Its Critics. [Formerly PSCI 207] The liberal tradition in political theory and its major challengers. Critical debates surrounding the relationship between individuals and political community, rights, freedom and equality. Repeat credit for students who have completed 2207W. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2207W. Liberalism and Its Critics. [Formerly PSCI 207W] The liberal tradition in political theory and its major challengers. Critical debates surrounding the relationship between individuals and political community, rights, freedom and equality. Repeat credit for students who have completed 2207. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2208. Law, Politics, and Justice. [Formerly PSCI 208] Contemporary and classical theories of law and society: rights theories, gender and the law; law and transitions to democracy; law between nations. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2209. Issues in Political Theory. [Formerly PSCI 209] Topics vary from semester to semester. May be repeated once if there is no overlap with previous offerings. Prerequisite: 2202, 2203, or 2205. [3] (No AXLE credit)

PSCI 2210. West European Politics. [Formerly PSCI 210] Analysis of political development, social forces, institutions, and public policy in Great Britain, France, Germany, Italy, and Sweden. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 2211. Terrorism and Intrastate Conflict. Intrastate conflict and terrorism. Political violence. Organizational economics of militant groups; strategies for counterinsurgency. Data explorations and quantitative analyses. Offered on a graded basis only. No credit for students who have earned credit for 3895 section 02 offered fall 2018 or 3895 section 01 offered fall 2017. Prerequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2213. Democratization and Political Development. [Formerly PSCI 213] Comparative study of political development, with a focus on institutions. The effect of political choices about voting systems, executive

and legislative powers, cabinet formation, and other institutions on political competition, parties and government stability. Cases from established democracies and countries undergoing democratization. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2215. Change in Developing Countries. [Formerly PSCI 215] Comparative study of political and economic change in developing countries. Political implications of ethnicity, economic dependency, and environmental degradation. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2216. The Chinese Political System. [Formerly PSCI 216] Governmental institutions and political processes in the People's Republic of China with emphasis upon the interaction of traditional and revolutionary elements. Some attention to Taiwan since 1950 and to the overseas Chinese as parts of the Chinese political universe. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 2217. Development in South Asia. Political economy of development in South Asian countries, with a focus on India, Pakistan, and Bangladesh. Democracy, growth, poverty, inequality, education, health, and gender equity. Offered on a graded basis only. No credit for students who have earned credit for 3894-01 offered fall 2016, fall 2017, or fall 2018. [3] (SBS)

PSCI 2219. Politics of Mexico. [Formerly PSCI 219] A survey of contemporary Mexican politics from a comparative perspective. Interaction of economic, social, and political forces that led to the demise of one of the world's most durable one-party political regimes and the prolonged transition to democracy. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2220. Crisis Diplomacy. [Formerly PSCI 220] Foreign policy decision making and strategy. Emphasis on differences between crises that lead to war and those that do not. Foreign relations of Britain, France, Germany, Russia, and Japan. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2221. Causes of War. [Formerly PSCI 221] Scientific study of the onset of expansion and consequences of war; conditions of peace, emphasizing alliances, arms races, and crisis escalation. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2222. American Foreign Policy. [Formerly PSCI 222] Critical analysis of major international and domestic factors shaping U.S. foreign relations as reflected in selected twentieth- and twenty-first-century experiences. Not open to students who have earned credit for PSCI 1111-01 without permission. Total credit for this course and PSCI 1111-01 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2223. European Political Economy and Economic Institutions. [Formerly PSCI 223] Policy-making processes of key economic institutions that influence the global political economy. International and financial regulatory reforms. World Trade Organization negotiations and current European economic issues. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2225. International Political Economy. [Formerly PSCI 225] Survey of major issues involving the interaction of political and economic forces at the global level. Particular attention to theories of interdependence and imperialism, the position of developing countries in the international system, multinational corporations, and the economic origins of war. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2226. International Law and Organization. [Formerly PSCI 226] The role of international law and international organizations in the contemporary global political system. Focus on the evolution and impact of international law, the United Nations, the International Monetary Fund (IMF), and selected regional organizations. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2230. Middle East Politics. [Formerly PSCI 230] Cross-national analysis of political institutions, political economies, and processes of change in the Middle East. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2235. The United States Military. Structure and culture of the U.S. military across all branches. Policy issues related to the armed forces. The soldier and military in art and popular culture. [3] (US)

PSCI 2236. The Politics of Global Inequality. [Formerly PSCI 236] Causes of international inequality in the distribution of wealth. The emergence of rich and poor nations, and rich and poor people. Factors related to economic development, and their impact on income distribution. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2237. African Politics. [Formerly PSCI 237] Pre-colonial to the present. State-building, socioeconomic development, public service provision, and foreign interventions. Conflict including: separatism, insurgency, slavery, genocide, and gender-based violence. Rise of democracy including party systems, voting behavior, electoral competition, fraud. Identity politics of ethnicity, gender, class, and clash of Western and local norms. Offered on a graded basis only. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2238. Identity Politics in the Non-Western World. Causes and consequences of the politics of racial and ethnic identities across the developing world. Ethnic politics, affirmative action, immigration, urbanization, and violent conflict. [3] (SBS)

PSCI 2240. Political Parties. [Formerly PSCI 240] Theories of party formation, organization, and behavior. Historical development of party systems. Criteria for the comparative evaluation of party systems. Parties as instruments of citizen control. Implications for electoral outcomes, coalition formation, legislative decision making, and public policy. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2241. U.S. State Governments. Description Influence of U.S. state governments in daily life. Constitutional framework surrounding federalism vis-a-vis structures of state governing bodies. Electoral systems. Representation by the three branches of government. Public policymaking on the state level. [3] (SBS)

PSCI 2243. Political Campaigns and the Electoral Process. [Formerly PSCI 243] Theories of representation and democratic accountability; electoral strategies and tactics, including political polling and analysis. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2245. The American Presidency. [Formerly PSCI 245] Constitutional, historical, and political aspects. Attention to electing and nominating president, presidential leadership and personality, governing, and relations with Congress and the public. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

PSCI 2251. The Politics of U.S. and Global Immigration. [Formerly PSCI 251] Political, philosophical, and moral issues. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 2253. Public Administration. What administrative agencies do and why. Effective management in the public sector, including public budgeting, implementation, personnel management, and communication with the public and the press. Serves as repeat credit for PSCI 3893-03 in Spring 2017 and PSCI 3893-01 in Fall 2015. [3] (SBS)

PSCI 2255. Public Policy Problems. [Formerly PSCI 255] Specific problems of public policies and their relations to political and institutional structures. Particular policy problems vary from semester to semester. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 2256. Politics of Public Policy. [Formerly PSCI 256] Understanding and navigating the policy process. Public opinion, media, elections, interest groups, and agenda settings. Legislatures, executives, decision making, implementation, and policy feedback. Current policy issues. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2259. Political Strategy and Game Theory. [Formerly PSCI 259] Campaigns and elections, legislative politics, political bargaining, and political organization. Applications of decision and game theory. Models of complete and perfect information, and games of incomplete information. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2262. The Judicial Process. [Formerly PSCI 262] Functioning of the judiciary in the American political process; operation and powers of the courts; non-legal aspects of the judicial process; political role and effects of judicial decisions. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2263. Religion and Politics. Religion in modern societies. Faith and civic culture, religion's presence in the public square, religion and colonialism, abortion, gay marriage, faith-based initiatives. Historical works and contemporary contributions to debates. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 2265. Constitutional Law: Powers and Structures of Government. [Formerly PSCI 265] U.S. constitutional system and fundamental principles of constitutional interpretation. Judicial development of principles of distribution and scope of governmental powers. Case method. No credit for students who have earned credit for 261. Repeat credit for students who completed 261a prior to fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

PSCI 2266. Constitutional Law: Civil Liberties and Rights. [Formerly PSCI 266] Supreme Court's interpretation of the Bill of Rights and the Fourteenth Amendment. Case method. No credit for students who have earned credit for 261. Repeat credit for students who earned credit for 261b prior to fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

PSCI 2267. Voting and Political Representation in America. [Formerly PSCI 267] The history of voting rights and the efficacy of representation in the American political system. Political participation, voting rights, felony disenfranchisement, redistricting, and alternative electoral systems. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

PSCI 2270. Conducting Political Research. [Formerly PSCI 270] Research sources, designs, and methods used by political scientists. Locating and accessing data, the logic of causal inferences, and basic data presentation and analysis. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2273. Conflict Management. [Formerly PSCI 273] Conflict management in international and domestic disputes. Negotiation, mediation, adjudication, intervention, and peacekeeping. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2274. Nature of War. [Formerly PSCI 274] Warfare from ancient to contemporary times. Western and non-Western perspectives. Views from political science, philosophy, history, and official U.S. military doctrine. Interplay among international politics, military strategy, technology, and psychology. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 2275. Politics and Strategy of Weapons of Mass Destruction. Causes and effects of the spread of nuclear, biological and chemical weapons, and the history of their use. Responses to the proliferation of WMD, including deterrence, preventive war, and non-proliferation agreements. Nuclear strategy from the Cold War to the present; WMD terrorism. Prerequisite: 1102. [3] (SBS)

PSCI 2279. Logic of Politics. [Formerly PSCI 279] Rational choice analysis of politics. Individual and collective choice. Collective action, public goods, and externalities. Prerequisite or corequisite: 100, 101, 102, 103, or 150. [3] (SBS)

PSCI 2300. Introduction to Data Science for Politics. Problems and techniques using data and statistics to describe and understand political phenomena. [3] (SBS)

PSCI 3206. Radical Political Theory. Major frameworks of modern and contemporary political theory. Subjection and domination, communism and capitalism, feminism and politics of work, neoliberalism and biopower, and colonialism and politics of race. [3] (HCA)

PSCI 3211. The European Union. [Formerly PSCI 211] Political and economic integration. Origins, institutions, decision processes, policies, achievements, and prospects of the European integration movement. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 3217. Latin American Politics. [Formerly PSCI 217] Cross-national analysis of political institutions, cultures, and processes of change in Latin America. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 3218. Public Opinion and Democracy in Latin America. Practicum on survey research methods with applications in Latin America. Questionnaire design, analyzing survey data, and interpreting results. Serves as repeat credit for PSCI 3894-05 in Spring 2017. [3] (SBS)

PSCI 3219. La política de América Latina. Optional discussion taught in Spanish. Open to students concurrently enrolled in PSCI 3217, and who have proficiency in Spanish at or above intermediate-level. Corequisite: 3217. [1] (No AXLE credit)

PSCI 3228. International Politics of Latin America. [Formerly PSCI 228] Examination of Latin America's role in the international and inter-American system. Special attention to the international response to revolutionary change in the area, and to the region's major actors and their changing relationship with the United States, with other major powers, and with other actors such as multinational corporations and international financial institutions. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 3229. Strategy and International Politics. [Formerly PSCI 229] Strategic behavior and strategic choices arising from interactive decision making within the context of international politics. General principles of strategy. In-class experiments and game playing. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3235. Political Islam. [Formerly PSCI 235] Rise of political Islam. Origins, goals, and practices of specific Islamic groups throughout the Middle East. Global and local causes of Islamic political mobilization, and the American response to that mobilization. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 3241. American Public Opinion and Voting Behavior. [Formerly PSCI 241] The development and dynamics of political opinion and its effects on voting and public policy. Models of political behavior. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3242. Police and Prisons. Political mechanisms driving crime policy, policing outcomes, and modern mass incarceration. Theories of punishment, racial disparities, public opinion, and reform. Serves as repeat credit for PSCI 3891-01 section 01 in Spring 2017. [3] (SBS)

PSCI 3244. The Legislative Process. [Formerly PSCI 244] Legislative organization and processes in the U.S. Congress. Attention to parties, elections, institutional structure, interest groups, and other branches of government as they relate to the legislative process. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3247. American Political Culture. [Formerly PSCI 247] Content, historical development, and political consequences of the American public's deeply rooted values concerning how the political system ought to work and the ends it ought to serve. Attention to regional variation. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

PSCI 3249. American Public Opinion and American Politics. [Formerly PSCI 249] Origins and effects of public opinion on politics in the United States. Influence of values, emotion, prejudice, and news information on individual political views. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3250. Group Conflict and Cooperation in U.S. Politics. [Formerly PSCI 250] Psychological and institutional sources of division and unity in American politics. Identity formation and change, explicit and implicit racial attitudes, and political tolerance. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3252. Business and Public Policy. [Formerly PSCI 252] Relationships among business, public policy, and political strategy in the United States and other political systems. Lobbying and legislative politics, antitrust and regulation, intellectual property, international trade, and ethics and corporate social responsibility. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3253. Ethics and Public Policy. [Formerly PSCI 253] Political and moral values in assessing policy-making, public policies and processes, and policy impacts. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 3254. Political Psychology. [Formerly PSCI 254] Interface between politics and the psychological processes of individuals and groups. Cognition, emotion, identity and intergroup relations, leadership, and extremism. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3258. Democratic Theory and Practice. [Formerly PSCI 258] Theories of democratic institutions, practices, and values in historical and contemporary political thought. Impact of popular participation on issues of justice, equality, individual freedom, and political power. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 3260. Introduction to American Law. [Formerly PSCI 260] Law as a component of public policy and the political system; the elements and rationale of private law. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3264W. Global Feminisms. [Formerly PSCI 264W] Global politics through feminist perspectives. Interrelated systems of power. Race, gender, sexuality, colonialism, and imperialism. Health, genocide, and slavery. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (INT)

PSCI 3265. Human Rights in Activism. Role of human rights in struggles against injustice. Identification of key problems of injustice addressed by a human rights framework. Problems with human rights as a tool for activism. Discussion in contemporary politics. Intellectual and legal traditions that have developed around human rights. No credit for students who have earned credit for PSCI 3896 section 01 offered fall 2016. Offered on a graded basis only. [3] (P)

PSCI 3266. Climate Change Justice. The challenge of addressing catastrophic climate change. Rationales for integrating or separating global climate and justice goals. Relationship between greenhouse gas emissions and poverty. Global and local public and private policy for climate change and justice. Offered on a graded basis only. [3] (INT)

PSCI 3268. American Health Policy. [Formerly PSCI 268] Structure of the American health care system. Challenges to providing care and improving health. Private and public insurance, inequality, cost growth, quality of care, and reform. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3270. Human Rights. Factors affecting government violation of human rights. Patterns of violations and their explanations. Domestic and international solutions to protect human rights. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3271. Feminist Theory and Research. [Formerly PSCI 271] Introduction to feminist works in the social sciences. Development of feminist analysis. Important issues, feminist theories, and approaches to social criticism. Methodological challenges to feminist research. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (P)

PSCI 3272W. The War in Iraq, 2003-2011. [Formerly PSCI 272W] The structure of and changes in the U.S. military. Development of Iraqi political institutions. American foreign policy making. Serves as repeat credit for students who completed 287 section 1 in fall 2010 or HUM 161 section 1 in fall 2009. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (US)

PSCI 3273. Networks and Politics. How webs of social relationships affect political behavior; applications to American politics, Comparative politics and international relations. Both online and offline social networks. Concepts, theory, and empirics. Prerequisite: 1101 or 1102. [3] (SBS)

PSCI 3275. National Security. [Formerly PSCI 275] How states ensure their national security. Origins of the security dilemma; the use of power, deterrence, coercion, engagement, and interstate cooperation in settling disputes. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 3841. Directed Study. [Formerly PSCI 291A] Participation in research projects under the direction of a faculty supervisor. Consent of both the faculty supervisor and the director of undergraduate studies is required. Open only to junior and senior majors. May be repeated for a total of 6

credits in 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3] (No AXLE credit)

PSCI 3842. Directed Study. [Formerly PSCI 291B] Participation in research projects under the direction of a faculty supervisor. Consent of both the faculty supervisor and the director of undergraduate studies is required. Open only to junior and senior majors. May be repeated for a total of 6 credits in 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3; maximum of 6 credits total for all semesters of PSCI 3841, 3842, 3851, and 3852] (No AXLE credit)

PSCI 3851. Independent Research. [Formerly PSCI 289A] Development of a research project by the individual student under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Normally open only to majors in political science. May be repeated for a total of 6 credits in 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3; maximum of 6 credits total for all semesters of PSCI 3841, 3842, 3851, and 3852] (No AXLE credit)

PSCI 3852. Independent Research. [Formerly PSCI 289B] Development of a research project by the individual student under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Normally open only to majors in political science. May be repeated for a total of 6 credits in 3841, 3842, 3851, and 3852 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3; maximum of 6 credits total for all semesters of PSCI 3841, 3842, 3851, and 3852] (No AXLE credit)

PSCI 3880. Internship Training. [Formerly PSCI 280A] Under faculty supervision, students from any discipline gain experience with local, state, national, and international government offices or other politically related organizations. A thorough report and research paper are submitted at the end of the semester. Completion of 6 hours of political science, normally a 2.90 grade point average, and prior department approval of the student's plan are required. May be taken on a Pass/Fail basis only and must be taken concurrently with 3882 and/or 3883. These hours may not be included in the minimum hours required in the political science major. Corequisite: 3882 and/or 3883. [1-9] (No AXLE credit)

PSCI 3891. Topics in Contemporary Politics. [Formerly PSCI 281] Political, governmental, and policy issues. May be repeated for credit when topics vary. No more than three hours may be counted toward the major. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [1-3] (No AXLE credit)

PSCI 3893. Selected Topics in American Government. [Formerly PSCI 283] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 3894. Selected Topics in Comparative Politics. [Formerly PSCI 284] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 3895. Selected Topics in International Politics. [Formerly PSCI 285] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 3896. Selected Topics in Political Theory. [Formerly PSCI 286] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 3897. Selected Topics. [Formerly PSCI 287] Topics of special interest. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. No more than a total of 6 credits may be earned for 3897 and 3898 combined. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 4238. Comparative Political Parties. [Formerly PSCI 238] Political parties and their role in the democratic process of modern liberal western democracies, focusing on party systems and party organizations. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 4257. The Politics of Capitalism. [Formerly PSCI 257] Commerce and capitalism in social and political life from the eighteenth century to the present. Questions of justice and equality, freedom, and democratic politics. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (HCA)

PSCI 4277. Future of Warfare. [Formerly PSCI 277] Political, societal, and technological factors that could affect the future conduct of warfare. Insurgency and counterinsurgency. Military operations other than war. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (SBS)

PSCI 4998. Senior Honors Research. [Formerly PSCI 299A] Open only to seniors in the departmental honors program. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

PSCI 4999. Senior Honors Research. [Formerly PSCI 299B] Open only to seniors in the departmental honors program. Prerequisite or corequisite: 1100, 1101, 1102, 1103, or 1150. [3] (No AXLE credit)

Portuguese

PORT 1001. Commons iSeminar. [Formerly PORT 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

PORT 1103. Intensive Elementary Portuguese. [Formerly PORT 102] Accelerated introduction to reading, writing, speaking, and listening. Emphasis on practical usage. Intended for students with prior or current study of another Romance language. No credit for students who have earned credit for 1101, 1102, or a higher level Portuguese language course. [3] (INT)

PORT 1111. First-Year Writing Seminar. [Formerly PORT 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

PORT 2203. Intermediate Portuguese. [Formerly PORT 200] Review of Portuguese grammar with emphasis on conversation, composition, and reading of modern Portuguese literary texts. No credit for students who have earned credit for a higher level Portuguese language course. Prerequisite: 1103. [3] (INT)

PORT 2205. Portuguese and Global Health. Speaking, reading, and writing; advanced grammar. Health in Brazil and Lusophone Africa, through literary texts, films, articles, and public health publications. Virtual language-learning partnerships with medical students in Lusophone Africa. Prerequisite: 2203. [3] (INT)

PORT 2900. Brazilian Civilization through English Language Material. [Formerly PORT 291] The cultural heritage of Brazil from its earliest days to the present. National identity, race relations, and Brazil's emergence as a major force in the Americas and beyond. Taught in English. Not open to students who have earned credit for PORT 1111 Section 01 without permission. Total credit for this course and PORT 1111 Section 01 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (P)

PORT 3301. Portuguese Composition and Conversation. [Formerly PORT 201] Expository writing and development of speaking skills. Emphasis on pronunciation, vocabulary, and grammar. Prerequisite: 2203. [3] (INT)

PORT 3302. Brazilian Pop Culture. [Formerly PORT 203] Development of written and oral communication skills through the study of Brazilian

popular culture. Movies, music, television, and magazines. Prerequisite: 2203. [3] (INT)

PORT 3303. Introduction to Luso-Brazilian Literature. [Formerly PORT 205] Critical readings and methods of literary analysis. Masterpieces from Portugal and Brazil from all genres in several periods. Conversation and writing. Prerequisite: 3301 or 3302. [3] (HCA)

PORT 3850. Independent Study. [Formerly PORT 289] A reading course, the content of which varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available to the student in the regular courses of the curriculum. [Variable credit: 1-3 hours, not to exceed 12 over a four-semester period] (No AXLE credit)

PORT 3891. Special Topics in Portuguese and Brazilian Literature or Civilization in English Translation. [Formerly PORT 295] Does not count toward a major or minor in Portuguese. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

PORT 3892. Special Topics in Portuguese Language, Literature, or Civilization. [Formerly PORT 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3303. [3] (No AXLE credit)

PORT 4350. Brazilian Culture through Native Material. [Formerly PORT 225] Differences between spoken and written Portuguese in Brazil. Modern culture, including popular music, film, politics, family life, and sports. Prerequisite: 3301 or 3302. [3] (P)

PORT 4420. Brazilian Literature through the Nineteenth Century. [Formerly PORT 232] Main literary trends, principal writers and works of Brazilian literature, from colonial beginnings through the nineteenth century. Study of the works of Gregório de Matos, Gonçalves Dias, Alencar, Machado de Assis, and Euclides da Cunha. Prerequisite: 3303. [3] (HCA)

PORT 4425. Modern Brazilian Literature. [Formerly PORT 233] Brazilian literature from the Semana de Arte Moderna to the present. Modernist and neo-Modernist movements. Prerequisite: 3303. [3] (HCA)

Psychology

PSY 1001. Commons iSeminar. [Formerly PSY 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

PSY 1111. First-Year Writing Seminar. [Formerly PSY 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

PSY 1200. General Psychology. [Formerly PSY 101] A survey of modern scientific psychology. Topics include development, perception, motivation, learning, thinking, remembering, emotion, intelligence, special aptitudes, and personality development. General applications to human behavior. The student must either analyze published research or be a subject in current research. Not open to students who have earned credit for 1111, sections 1, 2, or 3. Total credit hours for this course and 1111 (sections 1, 2, or 3) will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (SBS)

PSY 2100. Quantitative Methods. [Formerly PSY 209] Principles and methods for the statistical analysis of experiments, with emphasis on applications in psychology. Descriptive and inferential statistics. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

PSY 2150. Principles of Experimental Design. [Formerly PSY 208] Theory and research methods in psychological science. Philosophy of science, ethical issues, experimental design, and data interpretation. Prerequisite: 2100 or PSY-PC 2110. [3] (SBS)

PSY 3100. Abnormal Psychology. [Formerly PSY 215] Mental and emotional disorders. Definitions of adequate human functioning processes that disrupt functioning. Methods of evaluation and treatment. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3110. Social Psychology. [Formerly PSY 231] The influence of social conditions upon behavior in interpersonal and group relations. Perception, judgment, learning, and attitudes. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3120. Cognitive Psychology. [Formerly PSY 225] Attention, pattern recognition, knowledge representation, language, reasoning, and human intelligence. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3600. Personality. [Formerly PSY 211] Major theories of personality development, methods of assessment, and results of research, with an emphasis on normal behavior. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3605. Industrial and Organizational Psychology. [Formerly PSY 239] Scientific theories in cognitive, social, and personality psychology to improve work motivation and performance. Job analysis and assessment methods. Leadership, teamwork, and cross-cultural issues. Prerequisite: 1111 section 1, 2, or 3, or 1200; or a major in Cognitive Studies, Child Development, or Child Studies. [3] (SBS)

PSY 3610. Introduction to Clinical Psychology. [Formerly PSY 244] Historical foundations, professional ethics, principles of clinical assessment and therapy, and areas of specialization such as health psychology. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3615. Emotion. [Formerly PSY 245] Definitions and functions of emotion. Emotion and health, emotion and psychopathology, individual differences, and emotional development. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3620. Schizophrenia. [Formerly PSY 246] Neurological, psychological, cultural, and evolutionary perspectives. Genetics, epidemiology, symptomatology, sex differences, and affect. Prerequisite: 3100 and NSC 2201. [3] (SBS)

PSY 3625. Depression. [Formerly PSY 247] Psychological and biological perspectives on unipolar and bipolar affective disorders. Assessment and classification, epidemiology, genetics, family environment, and treatments. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3630. Drugs and Behavior. [Formerly PSY 261] Drug effects on neural circuits, human physiology, individual psychology, and society. Serves as repeat credit for students who have earned credit for NSC 3260 or NSC 3630. Prerequisite: 1200 or NSC 2201. [3] (SBS)

PSY 3635. Health Psychology. [Formerly PSY 268] Neurophysiological, endocrine, and immune systems. Factors underlying health habits and lifestyles. Methods to enhance health behaviors and prevent illness. Stress management. Reciprocal interactions among behavior, thoughts, and physiology with resulting effects on physical and psychological health and illness. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3640. Positive Psychology. [Formerly PSY 270] Optimal functioning in human psychology. Interdisciplinary approaches to well being, character strengths and virtues, positive emotions, and clinical implications. Not open to students who have earned credit for 1111, section 13. Total credit hours for this course and 1111, section 13, will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3700. Movement. [Formerly PSY 216] Psychological, computational, and neural perspectives on the activities of looking, reaching, grasping, speaking, smiling or frowning, walking and running. Prerequisite: 1111 sec-

tion 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

PSY 3705. Human Sexuality. [Formerly PSY 252] The physiological, psychological, and cultural bases of sexual behavior. History of sexuality, gender roles, sex in human relationships, diagnosis and treatment of sexual disorders and dysfunctions, cross-cultural perspectives, pornography, rape, AIDS, and homosexuality. [3] (P)

PSY 3715. Animal Behavior and Evolutionary Psychology. [Formerly PSY 258] Comparative and phylogenetic approach to the study of behavior, with special emphasis on sensory processes, instinctive behavior, the genetics of behavior, and ethology. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3730. Learning and Memory. Principles of learning and memory and their neural bases. Classical and operant conditioning; declarative and procedural memories; working memory and cognitive control. Strategies for optimizing learning in college; emotional and social influences; aging and diseases of the brain. Not open to students who have earned credit for 1111, section 8. Total credit hours for this course and 1111, section 8, will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Prerequisite: 1111 section 1, 2, or 3, or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS).

PSY 3750. Perception. [Formerly PSY 214] Current theory and research in sensation and perception, including an analysis of philosophical and biological issues. Biological organisms' acquisition, processing, and use of information about objects and events in the environment. Vision, audition, taste, smell, and touch. Prerequisite: Either PSY 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

PSY 3755. Behavioral Decision-making. [Formerly PSY 226] Affective, cognitive, and motivational processes involved in human judgment and decision-making. Accurate and inaccurate judgments. Optimal and suboptimal decisions. Offered on a graded basis only. Prerequisites: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

PSY 3760. Mind and Brain. [Formerly PSY 232] Concepts of cognitive neuroscience. Relationship between the brain and perception, cognition, attention, memory, language, thought, emotion, social judgments, and consciousness. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

PSY 3765. Social Cognition and Neuroscience. [Formerly PSY 238] Neural underpinnings of social perceptions, evaluations, and decisions. Face perception, attraction and reward processing, social co-operation and competition, decision-making, and moral judgments. Offered on a graded basis only. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3775. Human Memory. [Formerly PSY 253] Single- and dual-process models of recognition memory; context and the role of time in memory search; interference versus decay in theories of forgetting. Theories of association, memory for sequences, and memory disorders. [3] (MNS)

PSY 3780. The Visual System. [Formerly PSY 236] Interdisciplinary approach to the ways that humans see and interpret their visual environment. Structure of the eye and brain, including optics. Physiology of individual cells and groups of cells. Machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (MNS)

PSY 3785. Brain Damage and Cognition. [Formerly PSY 277] Effects of neurological impairment from stroke, injury, or disease on perception, speech, memory, judgment, and behavior. Relationship between brain systems and cognitive systems. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3810. Spatial Cognition. Cognitive and neural processes involved in spatial learning, memory, and navigation. Types and nature of spatial knowledge; path integration and wayfinding; gender and cultural differences in navigational skill; effects of technology (e.g., mapping applications); aging and diseases of the brain; comparative perspectives (humans vs. other mammals & insects). Serves as repeat credit for PSY 3891-01 in Fall 2017. Prerequisite: 1111 section 1, 2, or 3, or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (SBS)

PSY 3840. Directed Study. [Formerly PSY 290] Participation in ongoing research projects under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Open only to juniors and seniors. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [1-3] (No AXLE credit)

PSY 3850. Independent Study. [Formerly PSY 293] Development of a project by the individual student under direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. Open only to juniors and seniors. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [1-3] (No AXLE credit)

PSY 3880. Internship Training. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private organizations, institutions and agencies. Work must be related to issues within the spectrum of psychological science, including, but not limited to, neuroscience, clinical psychology, applied psychology, human development, behavior and performance. Credit hours earned are based upon actual work performed at the internship site. A minimum of 3 credit hours in background reading and research must be completed in PSY 3881 concurrently with and regardless of the number of hours earned in PSY 3880. A substantial research paper or report must be submitted at the end of the semester during which the internship is completed. These credit hours may NOT count in the minimum required for the Psychology major or minor. Normally, a 3.0 grade point average, 6 hours of prior course work in Psychology, and prior approval of a specific plan of work by the Director of Undergraduate Studies in Psychology are required. Offered on a Pass/Fail basis only and must be taken concurrently with PSY 3881. Corequisite: PSY 3881 Variable credit: 1-9 No AXLE Credit

PSY 3881. Internship Readings and Research. Under faculty supervision, students from any discipline can gain experience in a broad range of public and private organizations, institutions and agencies. Work must be related to issues within the spectrum of psychological science, including, but not limited to, neuroscience, clinical psychology, applied psychology, human development, behavior and performance. Credit hours earned are based upon readings or research supervised by one or more faculty to lend some intellectual foundation to the internship experience. At least one faculty supervisor must be a member of the Psychology Department in the College of Arts and Science at Vanderbilt. A minimum of 3 credit hours in background readings and research must be completed in PSY 3881 concurrently with and regardless of the number of hours earned in PSY 3880. A substantial research paper or report must be submitted at the end of the semester during which the internship training is completed. These credit hours may not count in the minimum required for the Psychology major or minor. Normally a 3.0 grade point average, 6 hours of prior course work in Psychology and prior approval of a specific plan of work by the Director of Undergraduate Studies in Psychology are required. Offered on a graded basis only and must be taken concurrently with PSY 3880. Corequisite: PSY 3880. [3-6] (No AXLE credit)

PSY 3890. Special Topics in Perception. [Formerly PSY 280] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3750. [3] (No AXLE credit)

PSY 3891. Special Topics in Cognitive Psychology. [Formerly PSY 282] May be repeated for credit more than once if there is no duplication

in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3120. [3] (No AXLE credit)

PSY 3892. Special Topics in Neuroscience. [Formerly PSY 285] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: NSC 2201. [3] (No AXLE credit)

PSY 3893. Special Topics in Clinical Psychology. [Formerly PSY 288] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3100. [3] (No AXLE credit)

PSY 3894. Special Topics in Social Psychology. [Formerly PSY 289] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. Prerequisite: 3110. [3] (No AXLE credit)

PSY 3980. Honors Seminar. [Formerly PSY 295A] Individual readings, reports, and seminar discussions of research areas representative of psychological science at Vanderbilt. The ethical conduct of research, advanced research methods and design, and philosophy of science are representative content areas. Open only to departmental honors candidates. [3] (No AXLE credit)

PSY 3981. Honors Seminar. [Formerly PSY 295B] Individual readings, reports, and seminar discussions of the basic areas of psychology. Selection of topics will provide some freedom to pursue individual interests. Open only to departmental honors candidates. Prerequisite: 1111 section 1, 2, or 3 or 1200; or a major in Child Development, Child Studies, or Cognitive Studies. [3] (No AXLE credit)

PSY 4218. Computational Cognitive Modeling. Human perception and cognition. Model implementation, parameter estimation, statistical model evaluation. Developing and testing new models: stochastic processes; simulation and Monte Carlo methods; high-performance computing. Prerequisite: one of 3120, 3760, 3775, or 3780; and one of CS 1101, 1103, or 1104. [3] (MNS)

PSY 4720. Experimental Methods in Behavioral Neuroscience. [Formerly PSY 234] Experimental methods in behavioral neuroscience. Computer-based data acquisition and analysis, statistical reasoning, and manuscript preparation. Prerequisite: 1200 and NSC 2201. [3] (MNS)

PSY 4730. Laboratory in Experimental Psychology. Experimental methods in psychological science. Evaluation of scientific literature, development of testable hypotheses, and computer-based experimentation including programming, data collection, and analysis. Prerequisite: 2150; and 2100 or PSY-PC 2110. [3] (MNS)

PSY 4998. Honors Thesis. [Formerly PSY 296A] Participation with a staff member in work leading toward the senior thesis. This work may consist of readings and reports or active participation in research and will culminate in an independent research report. Open only to departmental honors candidates. Prerequisite: 3980 or 3981. [3] (No AXLE credit)

PSY 4999. Honors Thesis. [Formerly PSY 296B] Participation with a staff member in work leading toward the senior thesis. This work may consist of readings and reports or active participation in research and will culminate in an independent research report. Open only to departmental honors candidates. Prerequisite: 3980 or 3981. [3] (No AXLE credit)

Public Policy Studies

PPS 1001. Commons iSeminar. [Formerly PPS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

PPS 3100. Cities in the 21st Century. Local policy and politics. Education, crime, health, finance, development, and transportation. Urban government and management. No credit for students who have earned credit for 3890-01 offered fall 2015, fall 2016, fall 2017, or fall 2018. [3] (SBS)

PPS 3150. Public Finance. State and local government finance. Revenue sources including taxation, debt, and fees. Financing and budgeting tools. The politics of financial decision making for state and local governments.

No credit for students who have earned credit for 3890-01 offered spring 2017 or spring 2018. [3] (SBS)

PPS 3850. Independent Research in Public Policy. Normally only open to majors in Public Policy Studies. May be repeated for a total of 6 credit hours, but students may only earn up to 3 credits per semester of enrollment. [1-3] (No AXLE credit)

PPS 3890. Special Topics. [Formerly PPS 294] Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

PPS 4960. Senior Seminar on Research in Public Policy. [Formerly PPS 295] Supervised research project in policy area incorporating methodologies and analytical insights from more than one discipline. Offered on a graded basis only. [3] (SBS)

Religious Studies

RLST 1001. Commons iSeminar. [Formerly RLST 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

RLST 1010. Encountering Religious Diversity. [Formerly RLST 101] Essential beliefs and practices of the world's major religious traditions. Hinduism, Buddhism, Judaism, Christianity, and Islam. Contemporary scholarship and perspectives on religious encounters from each of these traditions. [3] (HCA)

RLST 1100. Introduction to African American Religious Traditions. [Formerly RLST 107] Historical survey of the leadership, dynamics, and cultural milieu of African American religious traditions. Institutional expressions and theologies from the colonial period to the present. [3] (US)

RLST 1111. First-Year Writing Seminar. [Formerly RLST 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

RLST 1190W. Introduction to Southern Religion and Culture. [Formerly RLST 110W] An exploration of the histories of evangelical and non-evangelical expressions in Southern religious culture from the colonial period to the present. The evangelical thrust of Southern culture, with some attention to Catholicism, Judaism, and other religious modes considered outside the mainstream of that culture. [3] (SBS)

RLST 1200. Introduction to Judaism. [Formerly RLST 112] Comprehensive historical overview of Judaism as a religion and a culture. The main ideas and institutions of Judaism, the centrality of the Hebrew Bible and the meaning of interpretation, thinkers, and movements in Jewish civilization, from rabbinic Judaism, medieval philosophy, mysticism, to modern thought, Zionism, and the foundation of the State of Israel. Recent Jewish self-representation in art. [3] (HCA)

RLST 1208. Themes in the Hebrew Bible. [Formerly RLST 108] A thematic introduction to the Hebrew Scripture/Old Testament. Selected themes—such as creation, revelation, covenant, law, suffering, messianic expectation—are traced through the diverse parts of the Bible (Pentateuch, Prophetic Writings, and Wisdom Literature) as well as in early Jewish texts. The comparison of the various expressions of these themes shows both the distinctiveness of each document and the continuity of the Biblical faith through the centuries. [3] (HCA)

RLST 1309. Themes in the New Testament. [Formerly RLST 109] A comparative study of New Testament documents following central themes—such as salvation; evil and sin; the roles of Christ, God, and the Spirit; discipleship; the church; sacred history. The distinctive teaching of each New Testament document as related to a concrete historical setting. Comparison with similar themes in Jewish and Hellenistic texts of that period. [3] (HCA)

RLST 1330W. The Gnostic Gospels. [Formerly RLST 111W] Gnostic writings of the 2nd-4th centuries; relationship to other early Christian writings; modern views of Gnosticism. [3] (HCA)

RLST 1500. Introduction to Islam. [Formerly RLST 113] An historical overview of the different religious traditions in Islam, their basis in the Qur'an and life of the Prophet, their proliferation in the medieval period, and their response to the challenge of modernity. Topics include sunni and shi'i Islam, evolution of law and theology, sufism and political philosophy. Islam in Africa, India, Spain, and southeast Asia as well as the Middle East. [3] (HCA)

RLST 1637. Religions of Tibet and the Himalaya. [Formerly RLST 137] Sixth century CE to the present. Religious ideas and practices. Myth, cosmology, doctrine, pilgrimage, and ritual. Adaptation of religious tradition to changing historical and cultural contexts. Encounters among Tibetan Buddhism, Bön, Catholicism, and modernity. [3] (INT)

RLST 1700. Religions in China. [Formerly RLST 135] Major religious traditions of China. Taoism, Buddhism, Confucianism, state-sponsored religious systems, and popular religion. Thought and practice from ancient times to the present. [3] (INT)

RLST 1710. Religions of Japan. [Formerly RLST 136] Early myths to present-day practices. Buddhism, Shinto, Shugendo, Christianity, and new religious movements. Cosmology, ritual, death, and modernity. Thematic explorations through film. [3] (INT)

RLST 1820. Religion, Sexuality, Power. [Formerly RLST 120] Historical, cultural, social scientific, and philosophical theories of how religious and political ideas and institutions are related to and dependent upon assumptions and ideologies of sex, gender, and race. Politics and public discourse on sex and religion. [3] (SBS)

RLST 2210W. Constructions of Jewish Identity in the Modern World. [Formerly RLST 220W] How Jewish thinkers at the end of the nineteenth and early twentieth centuries addressed the question of individual and collective identity. Cultural, political, and religious definitions of modern Jewish identity, the role and the reinvention of national myths; the "Jewry of muscles," the "New Hebrews," the Zionist myth narratives in Zionism. [3] (HCA)

RLST 2220. Jewish Ethics. [Formerly RLST 222] A study of the logic and basic values that, in the Jewish tradition, guide thinking about moral problems. Examination of family and social ethical issues found in Talmud and other Jewish classical texts. Basic religious views of modern Jewish thinkers and their relation to contemporary Jewish life. Offered alternately with 1200. [3] (HCA)

RLST 2250W. History of the Bible. Jewish and Christian Bibles from the formation of earliest bibles to the present. Major forms of the Bible, major interpretive approaches, and impact on politics and culture. [3] (HCA)

RLST 2310. Interpreting the Gospels. [Formerly RLST 210] The Synoptic Gospels through history and culture. Focus on either Matthew, Mark, or Luke; a survey of the interpretations of the Gospel from its original historical context, through the history of the church, and more recently in Catholic and Protestant churches after the Holocaust, in African American churches, and in feminist circles. [3] (HCA)

RLST 2315. Introduction to Christian Ideas. Ancient, modern and contemporary debates in theology. Ideas of God, Jesus, Spirit, salvation, evil, and liberation. Key questions of science, belief, theism, race, gender, and colonial impact of Christian ideas. St. Paul, Augustine, Calvin, Tillich, Gutierrez, Cone, Daly, and Althaus-Reid. [3] (HCA)

RLST 2461. Islam in Africa. [Formerly RLST 261] Social and cultural development of Islam across Africa from the eighth century to the present, as illuminated by historical, ethnographic, and literary sources. Interplay between Muslims and outside religious groups, jihads in pre-colonial Africa, and Islam during European colonization. Attention to Sub-Saharan Africa. [3] (INT)

RLST 2471. Religion in Africa. [Formerly RLST 171] Indigenous religious forms from pre-colonial Africa to the present. Creation myths, notions about gods and spirits, ritual, magic, witchcraft, art, shamanism, and ancestry. Interplay of indigenous religions with Islam and Christianity. [3] (INT)

RLST 2472. Religion, Ecology, and Power in Africa. [Formerly RLST 272] The interrelationship between religion and ecology in Africa; the ways power relations in pre-colonial Africa through the present have determined human-Earth relations. Divine origin and development of the Earth and its peoples; influence on African social structure, ethnically-based occupations, and stewardship over the environment. [3] (INT)

RLST 2644. Buddhist Traditions. [Formerly RLST 244] Historical and thematic survey of foundational, Mahayana, and esoteric Buddhist traditions. Mythology, doctrine, meditation, devotional practices, and institutions. Contemporary case studies from Asia and North America. [3] (INT)

RLST 2664. Foundations of Hindu Traditions. [Formerly RLST 264] Hindu cosmology and the ritual structure of sacrifice. The effect of the law of cause and effect (karma) on the moral order of the universe (dharma). The emergence of bhakti devotion to key gods and goddesses. The escape from the cycle of lives through yoga, introspection, and devotion. Pilgrimage mapping and the sacred geography of ancient and modern India. Classical mythology of the Vedas, Epics, and Puranas. [3] (INT)

RLST 2811. Natural Science and the Religious Life. How scientific discoveries and religious teachings are related. Descriptions of the physical universe from Aristotle through Albert Einstein are compared to contemporary definitions of the moral life by religious thinkers such as Thomas Aquinas, Martin Luther, Immanuel Kant, and Martin Buber. [3] (P)

RLST 2881. Myth and History in Religious Biography. [Formerly RLST 181] Religious biography and hagiography as distinct literary genres. Hero mythology and narrative patterning. Ways religions construct unique biographical images by combining the historical life with religious belief. Examples from lives of Jesus, Buddha, Muhammad, Luther, Caitanya, Shinran, and Mama Lola. Interpretive strategies include hermeneutic theory, modes of history, structuralism, and feminism; additional theoretical perspectives on translation, orality, and reader response criticism. [3] (HCA)

RLST 2940. Great Books of Literature and Religion. [Formerly RLST 140] "Great Books" of the Western intellectual tradition, tracing Greco-Roman and Judeo-Christian literature and culture from their origins to synthesis in the medieval period. [3] (HCA)

RLST 3079. The Sacred and the Secular. [Formerly RLST 279] Ethnographies of ritual and religious life. Politics of secularism and religious revival. Issues in anthropology, literature, and philosophy. Christianity, Hinduism, Islam, and Native American Religions. [3] (P)

RLST 3119. Martin Luther King, Jr., and the Social Roles of Religion. [Formerly RLST 219] King as religious leader and agent of social change. His views of the social roles of religion seen against the background of late nineteenth-century dissenting traditions and the early twentieth-century social gospel movement in America. Critical evaluations in terms of classical Christian views (e.g., Aquinas, Luther, Calvin, Wesley). [3] (US)

RLST 3129. Race and Religion in America. The religious foundations of racial myths, symbols, images, conflicts, and cultures from the sixteenth century to the present. Gender, violence, sexuality, media, and popular culture. [3] (US)

RLST 3142. Slave Religion and Culture in the United States' South. [Formerly RLST 242] The religious thought of African American slaves as expressed through folklore, literature, and art. Creative ideas about the cosmos, the supernatural, transcendent spiritual reality, natural social reality, and the human condition. [3] (US)

RLST 3178. Native American Religious Traditions. [Formerly RLST 278] Diversity of First Nation religious traditions in North America, especially Eastern Woodlands and Plains. Spiritual and cultural dimensions of diversity, cosmologies, stereotypes, cultural resilience, creativity and storytelling, humor, rituals and practices, healing, and sovereignty. [3] (HCA)

RLST 3225. Sexuality in the Hebrew Bible and the Ancient Near East. [Formerly RLST 225] Issues of sexuality in the Hebrew Bible in the context of the Ancient Near East. Homosexuality, virginity, and incest. [3] (HCA)

RLST 3229. The Holocaust: Its Meanings and Implications. [Formerly RLST 229] Interdisciplinary study of the systematic destruction of European Jewish communities during WWII. Historical, social, political, cultural developments that led to it. Psychological and sociological dimensions of its

aftermath. Philosophical and theological problems it raises for both Jews and Christians. [3] (P)

RLST 3270. Jewish Theories of Religion. [Formerly RLST 203] Critical analysis and discussion of modern Jewish constructions of religion: politically, symbolically, ethically, normatively, and aesthetic-mystically. Selected readings from Cohen, Buber, Rosenzweig, Kaplan, and social philosophers such as Simmel and Habermas on the function, nature, and meaning of religion in secular culture. [3] (P)

RLST 3304W. Evangelical Protestantism and the Culture Wars. [Formerly RLST 204W] Evangelical traditions from the reformation to their present manifestations in twentieth-century America. Debates concerning the authority of the scripture, the person of Jesus Christ, evangelism, and soul-winning mission, revivalism and social reform, church-state relations, the relationship between science and religion, Biblical vs. "New" morality, and other areas of cultural cleavage. [3] (US)

RLST 3306. Global Interpretations of Christian Scriptures. [Formerly RLST 206] Comparative interpretations of Biblical texts by Christians in Africa, Asia, Latin America, and Oceania - with those by Orthodox Christians in Eastern Europe and the Middle East, and by Catholics and Protestants in Western Europe and North America. The role of culture in each type of biblical interpretation. [3] (INT)

RLST 3312. The Pauline Interpretation of Christianity. [Formerly RLST 212] An introduction to Pauline Christianity and its place in the early church, using the letters of Paul, the deuter-Pauline letters, and the portrait of Paul in Acts. [3] (HCA)

RLST 3313. Ethics of the New Testament. [Formerly RLST 213] Major ethical teachings as presented in New Testament documents, letters, and as interpreted through history and cultures. [3] (HCA)

RLST 3316. Christianity in the Reformation Era. [Formerly RLST 216] The setting of the Reformation (c. 1500-1648) and its developments together with consideration of some of the significant ecclesiastical, theological, and historical issues of the period. Attention to backgrounds and causes and examination of major individuals and ecclesiastical patterns. The aim of the course is to help students understand and interpret the events, become familiar with some of the major theological documents, and reflect upon questions of continuing historical interest that have come out of the Reformation. [3] (HCA)

RLST 3350. Christian-Jewish Relations in Medieval and Early Modern Europe. Political and cultural history from the medieval persecutions to the expansion of religious toleration in the Enlightenment. Close consideration of legal toleration, banishments, re-admissions, and the impact of Christian reform movements. [3] (INT)

RLST 3380. History of the Christian Tradition. [Formerly RLST 180] Christian traditions from the origins to the present. Such themes as Christology, church and state, and the social and cultural contents of changing Christian beliefs, and views of the Church. [3] (HCA)

RLST 3561. Islam in South Asia. History of Islam in South Asia. Cultural memory of conquest. Inter-religious interactions. Sufism and Bhakti. Mughal traditions of cosmopolitanism. Legacy of colonialism. Impact of Partition. Shared popular culture and shared sacred spaces. [3] (INT)

RLST 3650. Classical Philosophies of India. [Formerly RLST 250] Hindu and Buddhist traditions. The six "mainstream" schools (darsana) of Hindu thought and their interaction with Buddhist philosophy in ancient India. [3] (INT)

RLST 3669. Sacred Space in the Tibetan World. [Formerly RLST 269] Creation, mediation, and reproduction of sacred space from artifacts to built structures to geographies. Narrative, ritual, and cosmological aspects of Tibetan Buddhist, Bön, and local religious traditions. Cases include pre-modern to modern periods, and local to global contexts. [3] (INT)

RLST 3670W. Buddhism and the State. [Formerly RLST 270W] Models relating Buddhism and the state in ancient and modern Asia. Kingship and spiritual leadership; sacred territory and national identity; legitimation theory and its alternatives; and religious responses to the modern state. Case studies from India, Nepal, Thailand, Burma, Tibet, Mongolia, China, and Japan. [3] (INT)

RLST 3747. Daoist Tradition. [Formerly RLST 247] Historical and thematic survey of the Daoist tradition in China. Philosophical classics and religious scriptures, as well as social history are covered. Daoism today. [3] (HCA)

RLST 3749. Zen Buddhism. [Formerly RLST 249] A study of the development of Zen Buddhism in China and Japan with special attention to its basic philosophy, its position within Mahayana Buddhism, its meditational techniques, and its contemporary significance. [3] (INT)

RLST 3753. East Asian Buddhism. [Formerly RLST 253] East Asian Buddhist texts. Key Buddhist ideas, values, practices, and institutions. Chronological surveys of key developments in major historical periods. [3] (INT)

RLST 3775. Chinese Religions through Stories. [Formerly RLST 275] Analysis of narratives from various religious traditions and genres within early and medieval China. The role of narrative in Chinese religious, cultural, and political life. Primary texts in English translation. Offered on a graded basis only. [3] (INT)

RLST 3850. Independent Study. [Formerly RLST 289A] May be repeated for a total of 6 credits in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of RLST 3850 and 3851] (No AXLE credit)

RLST 3851. Independent Study. [Formerly RLST 289B] May be repeated for a total of 6 credits in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of RLST 3850 and 3851] (No AXLE credit)

RLST 3890. Special Topics in Religious Studies. [Formerly RLST 294] May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

RLST 3900. Mysticism and Spirituality, Comparative Study. [Formerly RLST 200] Philosophical, historical, and textual perspectives. Key mystical traditions, philosophies, texts, and figures from Hindu, Buddhist, and Christian traditions. The popular emergence of spirituality as a contemporary mode of religiosity in advanced capitalist societies. [3] (P)

RLST 3921. Ethics and Ecology. [Formerly RLST 221] Relationships among humans, nature, and the sacred. Focus on understandings of our 'dominion' over non-human nature. The role of religion in shaping attitudes and behaviors regarding the environment. Topics include eco-centered ethics, "creation care," reliance on fossil fuels, and alternative sustainable scenarios. [3] (SBS)

RLST 3926. Ancient Goddesses. [Formerly RLST 226] Ancient concepts of the feminine divine in literature and iconographic evidence. Specific goddesses, their spheres of influence, and their place in the various pantheons. Cultic practices and religious syncretism across cultures, including Mesopotamia, Egypt, and Ancient Israel. Offered on a graded basis only. [3] (INT)

RLST 3930. Women and Religion. [Formerly RLST 230] Themes and issues in the traditions and texts of selected Western religions from a feminist perspective. Biblical and theological images of women, sources of religious authority, psychological and ethical implications of feminist approaches to religion. [3] (P)

RLST 3940. The Nature of Evil. [Formerly RLST 240] Human evil as expressed in the Shoah, religious fundamentalism, and ethnic cleansing. Theological, philosophical, biological, and literary texts. Evil transformed by scientific inquiry since 1600. [3] (HCA)

RLST 3941. Religion, Science, and Evolution. [Formerly RLST 241] Interactions between science and religion from antiquity to Charles Darwin. Subsequent modifications of Darwinism and religious responsibilities to evolutionary theories. [3] (SBS)

RLST 4100. Native American Philosophies. Shared concepts and principles among contemporary Native American writers. Time, space, personhood, ecology, and healing. Spirituality and narrative ontology. [3] (HCA)

RLST 4371. Through the Eyes of the Other: A History of Muslim-Christian Relations. Travelogues and interpretive accounts of encounter-

ing the religious and cultural "Other," Christian or Muslim. Increased awareness of long-standing relationship between two major religious traditions. Offered on a graded basis only. [3] (HCA)

RLST 4551. Islamic Mysticism. [Formerly RLST 251] Origins and development of mystical traditions in Islam; rise of asceticism; early Sufis; development and systematization of Sufi orders and teachings; evolution of theosophical dimensions of mysticism; present day Sufism and its spread in North America; comparison of Islamic mysticism with other forms of mysticism. [3] (HCA)

RLST 4552. Islam in the Modern World. [Formerly RLST 252] Impact of colonialism on Muslim societies and everyday life in the cities of the Middle East. Analysis through literary, religious, political, and ethnographic texts. Relationship of Sharia to the modern state; impact of modernity on the understanding and practice of religion. [3] (INT)

RLST 4554. The Qur'an and Its Interpreters. [Formerly RLST 254] The Qur'an and the Islamic tradition of interpretation. The treatment of Biblical prophets, Jesus and Satan. Interpretations will be drawn from all time periods including rationalist, dogmatic, Shi'i and mystical schools of interpretation. [3] (INT)

RLST 4562. Culture, Religion, and Politics of the Arab World. [Formerly RLST 262] Diversity and unity in Arab culture. Religious, sociopolitical, and historical factors shaping Arab identity in the modern age. Encounters and relationships between Arabs and the Western world. The Israeli-Palestinian conflict. [3] (INT)

RLST 4592. Advanced Seminar in Arabic. [Formerly RLST 292] Analysis of style and forms. Poetry, novels, popular literature, and historical chronicles. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

RLST 4593. Advanced Seminar in Islamic Tradition. [Formerly RLST 293] Analysis of original Arabic texts, manuscript reading, and research methods. Topics vary. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

RLST 4665. Mythologies and Epics of South Asia. [Formerly RLST 265] Classical Hindu and Buddhist mythologies of South Asia. Sanskrit Mahabharata and Ramayana epics. Regional adaptations of mythical themes in vernacular languages. Buddhist and Islamic narratives of romance and chronicle. Interpretive and performance strategies. Oral, literary, and visual modes of representation. Political deployment of myths. [3] (INT)

RLST 4666. Devotional Traditions of South Asia: Hindu, Muslim, Sikh. [Formerly RLST 266] Mythology of Hindu pantheon and worship through devotion or bhakti. Techniques for inculcating devotion through meditation, temple rituals, and pilgrimage. Entry of Islam into South Asia. Shi'i and Sufi practices. Sikh traditions. Role of vernacular languages in creating local traditions. Hindu-Muslim interaction, syncretism, and shared sacred space. Challenges to orthodoxy. [3] (INT)

RLST 4774. Japanese Mythology. [Formerly RLST 274] Antiquity to the present. Classic myths and re-tellings over time. Introduction to theoretical frameworks including comparative and historical. Politics, gender, and performance. [3] (INT)

RLST 4834. Post-Freudian Theories and Religion. [Formerly RLST 234] An examination of contemporary European and American schools of psychoanalysis. Focus on both the clinical and explanatory theories as they relate to the examination of religious experience. Recommended: 1820. [3] (SBS)

RLST 4835. Freudian Theories and Religion. [Formerly RLST 235] A critical assessment of psychoanalytic theories as an explanation of religious behavior. Study of the basic structure of these theories followed by a systematic critique of texts by Sigmund Freud and Erik Erikson. Examination of religious narrative forms. [3] (SBS)

RLST 4836. The Religious Self according to Jung. [Formerly RLST 236] The religious core of human existence as related to the concepts of the archaic unconscious and the birth of the self in C. G. Jung's analytical psychology. Study of the life and thought of Jung as illustrated by his

autobiography, Memories, Dreams, Reflections. Critical assessment of his theory as a means for understanding religious phenomena. [3] (SBS)

RLST 4837. Psychology of Religious Myth and Ritual. [Formerly RLST 237] Examination of religious rituals and myths from both Christian and other traditions. Critical review of major psychological theories of ritual and myth. Their relevance to an understanding of myth and ritual as religious phenomena. [3] (SBS)

RLST 4938. Marriage in the Ancient Near East and the Hebrew Bible. [Formerly RLST 238] Religious, legal, and socio-economic aspects of marriage. Survey of ancient Sumerian, Assyrian, Babylonian, and Egyptian sources, and relevant sections of the Hebrew Bible. Marriage as an institution at the beginning of recorded history. [3] (INT)

RLST 4939. Religious Autobiography. [Formerly RLST 239] The construction of identity in religious autobiography: motivations (personal salvation, witness, proselytism); relationships among self, God, and religious tradition; role of memory; cultural, gender, and religious differences. Readings may include Augustine, Gandhi, Malcolm X, Angelou, Wiesel. [3] (P)

RLST 4960W. Approaches to the Academic Study of Religion. [Formerly RLST 280W] Theories and methods for the academic study of religious traditions. Open only to junior and senior majors and minors. [3] (HCA)

RLST 4970. Majors Colloquium. [Formerly RLST 298] Regular presentations and critical readings of student projects and professional writings. May be repeated for credit twice for a total of 3 credit hours. Open only to majors. [1] (No AXLE credit)

RLST 4998. Senior Honors Thesis. [Formerly RLST 299A] Reading of primary research sources and writing an honors thesis under the supervision of the thesis adviser. Open only to senior departmental honors students. [3] (No AXLE credit)

RLST 4999. Senior Honors Thesis. [Formerly RLST 299B] Reading of primary research sources and writing an honors thesis under the supervision of the thesis adviser. Open only to senior departmental honors students. [3] (No AXLE credit)

Russian

RUSS 1001. Commons iSeminar. [Formerly RUSS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

RUSS 1101. First-Year Russian. [Formerly RUSS 101] Elementary conversation and reading with an emphasis on everyday situations. Introduction to Russian culture and life through contemporary Russian materials. No credit for students who have earned credit for a more advanced Russian language course. [4] (No AXLE credit)

RUSS 1102. First-Year Russian. [Formerly RUSS 102] Continuation of 1101 with emphasis on reading and talking about texts. No credit for students who have earned credit for a more advanced Russian language course. Prerequisite: 1101. [4] (INT)

RUSS 1111. First-Year Writing Seminar. [Formerly RUSS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

RUSS 1500. Introduction to Russian and East European Studies. History and culture of Russia and East Europe, 1700-present. Political history, intellectual history, literature, and culture of region. Russia and East Europe in historical and geopolitical context. [3] (P)

RUSS 1874. Russian Fairy Tales. [Formerly RUSS 183] Perspectives from history, psychology, politics, gender, and religion. Fairy tale adaptations by Pushkin, Tolstoy, Stravinsky, Nabokov, Bulgakov, and others. Knowledge of Russian is not required. [3] (INT)

RUSS 1910W. 19th Century Russian Literature. Literature as a battleground for the conflict between traditional values and new, rationalistic val-

ues introduced by industrialization and modernization. Gender relations, role of religion, social status of art, and rise of radical political movements. Texts by Tolstoy, Dostoevsky, and Chekhov. Knowledge of Russian not required. No credit for students who earned credit for 2310. [3] (HCA)

RUSS 1911W. 20th Century Russian Literature. Masterpieces of literature as reflections of and reactions to massive social and political changes. Utopian and dystopian writing; literature as investigative reporting; and sincerity vs. postmodern irony. Return to nationalism in Putin's Russia. Including writings by Nabokov and six Nobel laureates: Bunin, Pasternak, Sholokhov, Solzhenitsyn, Brodsky, and Alexievich. Soviet and contemporary genre fiction. Knowledge of Russian is not required. [3] (HCA)

RUSS 2201. Second-Year Russian I. [Formerly RUSS 203] Reading, speaking, listening, and writing. Grammar review and reading of contemporary Russian texts. Prerequisite: 1102. [4] (INT)

RUSS 2202. Second-Year Russian II. [Formerly RUSS 204] Reading, speaking, listening, and writing. Grammar review and reading of contemporary Russian texts. Prerequisite: 2201. [4] (INT)

RUSS 2210. Russia Today: Politics, Economics, and Culture. [Formerly RUSS 251] Four-week immersion in the history and culture of Russia. Travel to and interaction with residents in Vladimir, Moscow, St. Petersburg, and rural areas. Excursions to UNESCO World Heritage sites and volunteering at community organizations. Pre-departure readings and an examination must be completed. Knowledge of Russian is not required. [3] (INT)

RUSS 2230. Russia at War. [Formerly RUSS 230] Russia's wars as seen through depictions in literature, film, music, and video games. Works by Tolstoy, Eisenstein, Bulgakov, Babel, Borodin, and others. Knowledge of Russian not required. [3] (INT)

RUSS 2273. Russian Science Fiction. [Formerly RUSS 173] Masterpieces of the genre including Tarkovsky's *Solaris* and *Stalker*, the novels of the Strugatsky Brothers, and Protazanov's *Aelita*. Various media ranging from literature and film to video games. Knowledge of Russian not required. Serves as repeat credit for students who have earned credit for RUSS 2273W [3] (INT)

RUSS 2273W. Russian Science Fiction. Radical ideas at the intersection of technology, ideology, and the human as physical form and humanity in science fiction. Masterpieces of the genre including Andrei Tarkovsky's films, the novels of the Strugatsky Brothers, and Protazanov's *Aelita*. Film, fiction, conceptual art, video games, and their historical contexts throughout the twentieth century. Knowledge of Russian not required. Serves as repeat credit for students who have earned credit for 2273. [3] (INT)

RUSS 2434. Russian Cinema. [Formerly RUSS 234] Masterpieces of Russian and Soviet cinema from the silent period to the present. Montage theory, propaganda film, politics of the art house, and rise of the Russian blockbuster. Films by master directors Eisenstein, Vertov, Tarkovsky, Sokurov, and Zvyagintsev. Soviet musicals and contemporary popular cinema. Knowledge of Russian not required. [3] (INT)

RUSS 2435. Leo Tolstoy: *Anna Karenina* and Other Masterpieces. [Formerly RUSS 235] Early stories and post-conversion novellas. Realist masterpiece *Anna Karenina* and its film adaptations. Moral inquiry in Tolstoy's writing. Philosophical and psychological exploration into the themes of love, adultery, religion, work, and art. Knowledge of Russian is not required. [3] (INT)

RUSS 2436. Tolstoy's *War and Peace*. Tolstoy's famous novel in cultural, historical, political, and religious context. Selected early and late pieces by Tolstoy; critical commentaries on his place in Russian culture; and film and operatic adaptations of *War and Peace*. Tolstoy as artistic innovator, political anarchist, and significant moral voice for the 19th century. Serves as repeat credit for RUSS 2435 in Spring 2016. Knowledge of Russian is not required. [3] (INT)

RUSS 2438. Dostoevsky's *The Brothers Karamazov*. [Formerly RUSS 238] Historical, social, political, philosophical, and religious contexts of one of the great epics of Western and Russian literature. Influence on 20th and 21st century literature and culture. Knowledge of Russian is not required. [3] (INT)

RUSS 2460. Modern Yiddish Literature in Translation. Late nineteenth to mid-twentieth century. Diaspora, minority writing, gender, from shtetl to city, and the Holocaust. [3] (INT)

RUSS 2485. Russian Crime Fiction. Dostoevsky, Tolstoy, Nabokov, and others. Contemporary Russian interpretations of Sherlock Holmes and of classic Russian crime cinema. Knowledge of Russian is not required. [3] (INT)

RUSS 2537. Vladimir Nabokov. [Formerly RUSS 237] Major works including *The Luzhin Defense*, *Lolita*, *Invitation of a Small Guest*, and *Pale Fire*. Examination of Nabokov's life through his memoir, *Invitation of a Small Guest*, and excerpts from his unfinished final novel, *The Original of Laura*. Knowledge of Russian is not required. [3] (INT)

RUSS 2600. Women and Resistance in Russia. Cultural and political history of women's resistance in Russia, starting in the Putin era working back through the Soviet Union and Imperial Russia to Medieval saints. The concept of resistance and the specificity of female resistance in Russia. Historical narrative in light of missing sources. [3] (INT)

RUSS 2639. From the House of the Dead: Stories of Siberia. Depictions of Siberia from Russian and outside perspectives. Exile, imperial conquests, the Stalinist gulag, and native Siberian cultures. Works on Siberia by Dostoevsky, Tolstoy, Chekhov, Solzhenitsyn, Shostakovitch, Kurosawa, and Herzog. Pasternak's Siberia-themed masterpiece *Doctor Zhivago* and writings by native Siberians. Knowledge of Russian not required. [3] (INT)

RUSS 2745. Radical Art: The Avant-Garde Revolution. Introduction to experimental art—both verbal and visual—in the 1910s–1930s. Movements studied: Cubism, Futurism, Dadaism, Suprematism, Constructivism, and Surrealism through the avant-garde's engagement with various genres and media: the manifesto, performance, sound and image poetry, painting, photomontage, artist's book, magazine, film and architecture. Taught in English. [3] (INT)

RUSS 2800. Viewing Communism in Eastern Europe. Exploration of life in Communist Eastern Europe through film, memoir, fiction, photography, and documents. Life in a police-state, variations of socialism, dissent, public memory of the Second World War, revolution, and Communist nostalgia and legacy. [3] (INT)

RUSS 2810. Revolutions and Post-Communism in Eastern Europe and Eurasia, 1981–2010. Life in the Soviet Imperium. Revolutions of 1989 in Eastern Europe. Disintegration of the U.S.S.R., 1989–1991. Challenges of neoliberal transitions to free-market democracies. Post-socialist culture. Ecology and environmentalism; globalization; gender; religion and ideology; mass media; violence; ethno-nationalism; and authoritarianism. Taught in English. [3] (P)

RUSS 2820. Eastern Europe: Critical Encounters. Eastern Europe from Enlightenment to 1989. Nineteenth century imperial competition, birth of nation-states. Minority rights, World War II and the Holocaust, socialist experimentation, police state, and dissent. Revolutions of 1989. [3] (INT)

RUSS 2910. Russia: Old Regime to Revolution. Russian history from the early nineteenth-century old regime through the Russian Revolution of 1917. Culture, society, and serfdom; the Great Reforms, ideology, and radicalism; industrialization; modernity in an agrarian society; twentieth-century revolutions. [3] (INT)

RUSS 2915. Russia: The U.S.S.R. and Afterward. Russian history since the 1917 Revolution. Overview of the old regime; revolution and civil war; the Soviet "Roaring '20s"; Stalinism and the totalitarianized society; World War II. Postwar Soviet society and culture; de-Stalinization and the sixties generation; Gorbachev, perestroika, and disintegration; contemporary history. [3] (INT)

RUSS 3303. Advanced Grammar and Reading. Advanced grammar and reading skills. Prerequisite: 2202. [3] (INT)

RUSS 3305. Advanced Conversation and Composition. [Formerly RUSS 257] Advanced conversation and composition skills. Prerequisite: 2202. [3] (INT)

RUSS 3306. Advanced Russian Language through Culture and Literature. Literature, history, aesthetics, and politics in Russian-speaking

cultures. May be repeated for credit if there is no duplication in topic. Prerequisite: 2202. [3] (INT)

RUSS 3307. Advanced Russian Language through Visual Culture and Media. Cinema, media arts, visual culture, and media history of Russian-speaking cultures from pre-digital to the digital age. May be repeated for credit if there is no duplication in topic. Prerequisite: 2202. [3] (HCA)

RUSS 3308. Advanced Russian Language through Russian Society. Seminal aspects of Russian literature, culture, and civilization through interdisciplinary lenses. May be repeated for credit if there is no duplication in topic. Prerequisite: 2202. [3] (P)

RUSS 3850. Independent Readings. [Formerly RUSS 289A] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1–3; maximum of 6 credits total for four semesters of RUSS 3850 and 3851] (No AXLE credit)

RUSS 3851. Independent Readings. [Formerly RUSS 289B] Designed for majors and qualified undergraduates. Projects are carried out under the supervision of a member of the department. All projects must be approved by the department. May be repeated for a total of 6 credits over a four-semester period in 3850 and 3851 combined if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1–3; maximum of 6 credits total for four semesters of RUSS 3850 and 3851] (No AXLE credit)

RUSS 3880. Internship Training. [Formerly RUSS 280A] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Russia. Background reading and research must be completed in Russian 3881 concurrently with 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average and prior approval of the director of undergraduate studies of the student's plans are required. Offered on a Pass/Fail basis only and must be taken concurrently with 3881. Hours of 3880 cannot be included in the minimum hours counted toward the Russian majors or minors. Corequisite: 3881. [Variable credit: 1–9] (No AXLE credit)

RUSS 3881. Internship Readings and Research. [Formerly RUSS 280B] Under faculty supervision, students gain experience working in a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations in the United States and Russia. Background reading and research in Russian 3881 must be completed concurrently with 3880. A minimum of 3 hours of 3881 must be completed, independent of hours taken in 3880. Students may earn up to 6 hours of 3881 credit. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average and prior approval of the director of undergraduate studies of the student's plans are required. Corequisite: 3880. [Variable credit: 3–6] (No AXLE credit)

RUSS 3890. Selected Topics. [Formerly RUSS 294A] May be repeated for a total of 12 credit hours in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1–3; maximum of 12 credit hours total for all semesters of RUSS 3890 and 3891] (No AXLE credit)

RUSS 3891. Selected Topics. [Formerly RUSS 294B] May be repeated for a total of 12 credit hours in 3890 and 3891 combined if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [1–3; maximum of 12 credit hours total for all semesters of RUSS 3890 and 3891] (No AXLE credit)

Sanskrit

SNSK 1101. Elementary Sanskrit I. Fundamental elements of Sanskrit language in Devanagari script. [3] (No AXLE credit)

SNSK 1102. Elementary Sanskrit II. Development of reading, pronunciation, recitation, and grammatical proficiency. Materials from classical works of religion, philosophy, folklore, drama, and poetry. Discussion of Sanskrit milieu and historical development. Prerequisite: 1101. [3] (HCA)

Sociology

SOC 1001. Commons iSeminar. [Formerly SOC 99] Topics vary. General Elective credit only. [1] (No AXLE Credit)

SOC 1010. Introduction to Sociology. [Formerly SOC 101] The study of human society; the nature of culture and its organization. Processes of communication, socialization, mobility, population growth. Repeat credit for students who have completed 1010W. No credit for students who have earned credit for 103. [3] (SBS)

SOC 1010W. Introduction to Sociology. [Formerly SOC 101W] The study of human society; the nature of culture and its organization. Processes of communication, socialization, mobility, population growth. Repeat credit for students who have completed 1010. No credit for students who have earned credit for 103. [3] (SBS)

SOC 1020. Contemporary Social Issues. [Formerly SOC 102] Social change, conflict, and inequality in modern societies. Basic sociological concepts and methods as they apply to social issues and policy. Focus varies by section. Repeat credit for students who have completed 1020W. [3] (SBS)

SOC 1020W. Contemporary Social Issues. [Formerly SOC 102W] Social change, conflict, and inequality in modern societies. Basic sociological concepts and methods as they apply to social issues and policy. Focus varies by section. Repeat credit for students who have completed 1020. [3] (SBS)

SOC 1030. Environment and Society. Inequality, population, social change, technology, and the state. Application of concepts from general sociology and environmental sociology to environmental problems across institutional sectors such as food, water, energy, health, and transportation. [3] (SBS)

SOC 1041. Men and Women in American Society. [Formerly SOC 104] This course focuses on ideas about masculinity and femininity and how these ideas carry with them inequalities in the distribution of power and resources available to men and women. We examine how gender permeates seemingly neutral aspects of everyday life—how we date, sexuality, family life, work relationships, political life, media images. Repeat credit for students who have completed 1041W. [3] (P)

SOC 1041W. Men and Women in American Society. [Formerly SOC 104W] This course focuses on ideas about masculinity and femininity and how these ideas carry with them inequalities in the distribution of power and resources available to men and women. We examine how gender permeates seemingly neutral aspects of everyday life—how we date, sexuality, family life, work relationships, political life, media images. Repeat credit for students who have completed 1041. [3] (P)

SOC 1111. First-Year Writing Seminar. [Formerly SOC 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

SOC 2100. Statistics for Social Scientists. [Formerly SOC 127] Descriptive and inferential statistics with social science research applications. Sampling issues; describing data with measures of central tendencies and dispersion; hypothesis testing using categorical and continuous indicators; multivariate techniques for continuous, categorical, and time dependent data. Limited to majors and minors in Sociology, Public Policy Studies,

and Communication of Science and Technology, with preference given to Sociology majors and minors. [3] (No AXLE credit)

SOC 3001. Sociological Perspectives. [Formerly SOC 201] Major classical and contemporary sociological perspectives such as symbolic interactionism, functionalism, and conflict sociology. Attention to the orientation and style of outstanding representatives of each perspective. Analysis in terms of basic concepts, central questions, substantive themes, methodology, and bearing on contemporary social issues. [3] (P)

SOC 3002. Introduction to Social Research. [Formerly SOC 211] Overview and evaluation of research strategies. Interpretation of qualitative and quantitative data. Research methods and design. Evaluate research ethics, research hypotheses, and literature reviews. Prerequisite: 1010, 1010W, 1020, or 1020W. Open only to majors. [3] (SBS)

SOC 3003. Research Practicum. Review of sociological concepts and methods coupled with experience in data collection and analysis as applied to a research project underway by one or more sociology faculty members. May be repeated for a total of 6 credits if there is no duplication of content. [3] (No AXLE credit)

SOC 3201. Cultural Consumption and Audiences. [Formerly SOC 228] How audiences and consumers engage with art and culture—from popular music to film, classical art, fashion, and food. [3] (SBS)

SOC 3202. Cultural Production and Institutions. [Formerly SOC 229] The production of culture. The role of artists, firms, and markets in creating cultural objects, ideas, and practices, including novels, television and news, science, music, visual arts, and food. [3] (SBS)

SOC 3203. Art in Everyday Life. [Formerly SOC 214] Art and the public sphere. Cultural analysis, critical theory, art production and reception, curation, ethnography. [3] (SBS)

SOC 3204. Tourism, Culture, and Place. [Formerly SOC 218] Nature of tourist encounters. Marketing and displaying culture to tourists. Implications for urban economies and landscapes, and for tourists and locals. Ethics and dilemmas. Nashville as case study. Field-trip based learning. Frequent travel off-campus will pose scheduling conflicts with other classes immediately prior or after. Prerequisite 1010 or other Sociology class. [3] (SBS)

SOC 3205. Seeing Social Life. [Formerly SOC 219] History, theory, and ethics of visual images in sociological research. Truth status of visual data. How individuals and groups use photographs to make sense of social worlds. Race, ethnicity, gender, social class, and their visual documentation. Methods for collection and analysis of visual data, especially photographs. Prerequisite: SOC 1010, 1010W, 1020, 1020W, 1041, 1041W, or ANTH 1101. [3] (SBS)

SOC 3206. Creativity and Innovation in Society. [Formerly SOC 227] The social context for innovation and creativity. Interdisciplinary approaches to the creative process, invention, and entrepreneurship. Social relations and networks surrounding creative work; gate keeping; the diffusions of innovation; changing institutions; and economic forces. [3] (SBS)

SOC 3207. Popular Culture Dynamics. [Formerly SOC 248] Examination of theories and research that link culture and society. Consideration of the mass media arts with particular emphasis on popular music. Focus on creators, industry, and audiences. [3] (SBS)

SOC 3213. Artists, Community, and Democracy. Communities of diverse artists, minority viewpoints, and cultural pluralism in a democratic society. Contemporary United States with cross-cultural and historical comparisons. [3] (SBS)

SOC 3221. The Family. [Formerly SOC 230] Study of the relationship of family structure to social organization. Comparative and historical approaches to the family. Recent changes in the American family. Courtship, marriage, marital adjustment, parenthood, and family dissolution in relation to contemporary American society. [3] (P)

SOC 3222. Sociology of Religion. [Formerly SOC 246] Theories of the nature, function, and structure of religion. Religion in America, including fundamentalism, the Black Church, and cults. How religion changes and is changed by secular society. [3] (SBS)

SOC 3223. Schools and Society: The Sociology of Education. [Formerly SOC 254] How schools affect individuals and relate to institutions: the government, the economy, social classes, and families. How social attributes, including race and class, affect academic achievement. Controversies such as desegregation and intelligence testing. [3] (SBS)

SOC 3224. Sociology Through Baseball. Baseball as a social institution. Group dynamics; baseball as work and business. Free agency and law; race and ethnic relations. Globalization. Serves as repeat credit for students who have earned credit for 3224W. [3] (SBS)

SOC 3224W. Sociology Through Baseball. [Formerly SOC 265W] Baseball as a social institution. Group dynamics, baseball as work and business. Free agency and law, race and ethnic relations, and globalization. Serves as repeat credit for students who have earned credit for 3224. [3] (SBS)

SOC 3231. Contemporary Latin America. [Formerly SOC 277] Current history and long-term trends; regional trade. Development strategies and social inequalities. Hispanic Americans, immigration, and the U.S. border; the war on drugs. Race, music, and popular culture. [3] (INT)

SOC 3232. Contemporary Mexican Society. [Formerly SOC 279] Sociological understanding of contemporary Mexican society. Historical roots of the modern Mexican state. Economic, political, and social institutions operating in Mexico, formal and informal structures, and their consequences. [3] (INT)

SOC 3233. Contemporary American Society. [Formerly SOC 235] Shifts in the political, economic, and social structure of the United States; changes in technology, demography, and social mores. [3] (US)

SOC 3301. Society and Medicine. [Formerly SOC 237] Cultural and social factors in the perception, definition, diagnosis, treatment, and distribution of disease. Doctor-patient relations; role of nurses and other health professions. Social consequences of hospitals, medical technology, medical specialization, and health insurance. [3] (SBS)

SOC 3302. Poverty, Health, and Politics. [Formerly SOC 205] Politics of poverty, health, and social welfare policy in the U.S. from the 1930s to the present. Profiles of poverty and health. Social change, social movements, advocacy, and social enterprise. [3] (SBS)

SOC 3303. Social Dynamics of Mental Health. [Formerly SOC 264] Definition and classification of mental health and mental illness. Emphasis on social factors affecting mental health. Different ways of responding to persons in poor mental health and consequences of particular responses. [3] (SBS)

SOC 3304. Race, Gender, and Health. [Formerly SOC 268] Effect of racial and ethnic background, gender, socioeconomic status, sexual identity, and age or generation on the experiences of health, illness, medical institutions, and work in the health professions. [3] (SBS)

SOC 3306. Gender and Medical Work. Gender inequality in the health professions. Relationship between gender inequality and other forms of inequality in health care work. [3] (SBS)

SOC 3311. Climate Change and Society. [Formerly SOC 207] The sociology of climate change, including efforts to reduce greenhouse gases and problems caused by climate change. Comparative analysis of how governments and businesses develop strategies to adapt to climate change. [3] (SBS)

SOC 3312. Environment and Development. [Formerly SOC 208] Relationship between economic development and the natural environment. Implications of development on our contemporary ways of life and the environmental conditions of our planet. Different models of development for both Western industrial and developing societies, from early imperialism to contemporary globalization. Current global environmental crises, problems of environmental inequality and injustice, and social movements for alternative development initiatives. [3] (SBS)

SOC 3313. Sociology of Health and Environmental Science. [Formerly SOC 206] Basic concepts in the sociology of science and their applications to controversies in the health and environmental sciences. Toxins and risk, nutrition, and health. Health and environmental aspects

of emerging technologies. Case studies to develop generalizable social-science hypotheses. [3] (SBS)

SOC 3314. Environmental Inequality and Justice. [Formerly SOC 221] Relationships between social inequalities and environmental degradation, both in the U.S. and internationally. Distribution of environmental hazards across race and class, natural resource rights and management, urban health and sustainability, climate injustices, and environmental justice movements. Not open to students who have earned credit for WGS 1111 Section 4 without permission. Total credit for this course and WGS 1111 Section 4 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (SBS)

SOC 3315. Human Ecology and Society. [Formerly SOC 270] Demography, social organization, technology, and the global environment. Shifting energy systems; sustainable industries; food production. Growth vs. development. Affluence, waste, and recycling. [3] (INT)

SOC 3316. Business, Civil Society, and the Environment. Environmental sustainability and social responsibility; interactions among private sector, civil society, state, and consumers. Social movements and industry, politics of green consumption, and rise of third-party certification movements and private governance. Agriculture, fishing, and forestry industries. [3] (SBS)

SOC 3317. Energy Transitions and Society. Comparisons of contemporary societies' transition to low-carbon energy systems. Emphasis on renewable energy and energy efficiency. Perspectives include both wealthy and poor countries. [3] (INT)

SOC 3318. Sociology of Green Jobs. Comparative, historical, and theoretical perspectives of the contemporary transformation of work and employment in green jobs. Emphasis on the U.S. economy. [3] (SBS)

SOC 3319. NGOs, Society, and the Environment. Integrated sociological, political science, and nonprofit studies' perspectives on the roles and operation of nonprofits and environmental NGOs (ENGOs). NGOs as agents of social and environmental change. ENGOs as setters and implementers of environmental governance agendas and regimes. ENGOs as complex organizational actors. Internal logics and operation of NGOs. Basics of nonprofit management. [3] (SBS)

SOC 3321. Population and Society. [Formerly SOC 220] The mutual influence of demographic factors and social structure. Trends in fertility, mortality, population growth, distribution, migration, and composition. Population policy and national development. [3] (INT)

SOC 3322. Immigration in America. [Formerly SOC 274] Theories of international migration, with an emphasis on migration as a social process. Economic and social impact, including assimilation, immigrant incorporation, and the second generation. The migrant experience, including transnational practices, and how immigration redefines race, ethnicity, and gender. Immigration history of the United States. Current U.S. immigration law and policy. Debate on open borders. [3] (SBS)

SOC 3601. Self, Society, and Social Change. [Formerly SOC 204] Problems and prospects for individual participation in social change; volunteering, community service, and philanthropy; role of individuals and voluntary associations in social change. [3] (SBS)

SOC 3602. Change and Social Movements in the Sixties. [Formerly SOC 216] Mid-1950s to mid-1970s. The rise and influence of social movements in the 1960s, including civil-rights, student, anti-Vietnam War, feminist, and countercultural. [3] (SBS)

SOC 3603. Women and Social Activism. [Formerly SOC 225] History of women's participation in social movements. Women's citizenship, environmentalism, second- and third-wave feminism, hate movements, and global feminist activism. Theories of mobilization, collective identity, strategy, and movement outcomes. Not open to students who have earned credit for SOC 1111 Section 17 without permission. Total credit for this course and SOC 1111 Section 17 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. [3] (SBS)

SOC 3604. American Social Movements. Key social movements in American society. Mobilization, strategy, and effects of movements such as civil rights, LGBT+, feminism, environmental, and labor movements. [3] (US)

SOC 3605. Law and Social Movements. [Formerly SOC 252] Social activists and their relationship to the law and legal institutions. Activist litigation, movement legislative influence, protest policing, government surveillance of activists, and rights consciousness. Civil rights, women's, LGBT, environmental, and labor movements. [3] (SBS)

SOC 3611. Women and the Law. [Formerly SOC 224] History of laws in the U.S. subordinating women. Efforts by feminists to achieve substantive and procedural equity. Employment, educational, reproductive, and criminal law, and women's role in the legal profession. [3] (P)

SOC 3612. Class, Status, and Power. [Formerly SOC 236] Analysis of the competition for jobs, advancement, and income. The influence of social background, education, politics, race, sex, changes in national economy, and other factors will be considered. Theoretical and empirical analysis focusing on the United States. [3] (SBS)

SOC 3613. Law and Society. [Formerly SOC 240] Law, inequality, and racial, ethnic, gender, and economic groups in society. Operation of the legal system, including lawyers, courts, and police. Advantages and disadvantages in law. Law's role in social change. [3] (SBS)

SOC 3614. Politics, State, and Society. [Formerly SOC 244] The relationship between state and society; the nature and distribution of power in democratic society; the social conditions necessary for democracy; social movements and protest in political change; and the politics of public policy making. Attention to political actions, definitions of citizenship, and political ideology. [3] (SBS)

SOC 3615. Human Behavior in Organizations. [Formerly SOC 247] Organizations are treated as resources in the production and distribution of goods and services. Case analyses from the economy are reviewed to diagnose "organizational pathologies" and to understand reciprocal impacts among organizational structures, leaders, and citizens. [3] (SBS)

SOC 3616. Women and Public Policy in America. [Formerly SOC 251] A study of public policies as they affect women in contemporary American society. Issues considered include participation of women in the labor force; effects of employment patterns on the family; birth control, abortion, and health care policies; child care; participation of women in political processes; divorce, child support, and custody; affirmative action policies; present governmental remedies and proposed alternatives. [3] (SBS)

SOC 3621. Criminology. [Formerly SOC 231] The nature, distribution, causes, and control of crime with emphases on contemporary American society and a broad range of types of crime. [3] (SBS)

SOC 3622. Delinquency and Juvenile Justice. [Formerly SOC 232] The nature, distribution, causes and control of juvenile delinquency and the operation of the juvenile justice system in contemporary American society. [3] (SBS)

SOC 3623. Deviant Behavior and Social Control. [Formerly SOC 233] The social causes of, and societal reactions to, several types of deviant behavior (e.g., juvenile delinquency, crime, sex deviance, mental illness). Examines the probable consequences of suggested solutions to reduce different types of deviant behavior. [3] (SBS)

SOC 3624. Prison Life. [Formerly SOC 234] Prison life from the perspective of prisoners, officials, and the society in which they operate. [3] (SBS)

SOC 3701. Racial Domination, Racial Progress. [Formerly SOC 253] Racial and ethnic relations in contemporary American society. Impact of race and ethnicity on education, economics, politics, family, and health. Study of Whites, Blacks, Hispanics, Asians, and Native Americans. Color-blind ideology. [3] (SBS)

SOC 3702. Racial and Ethnic Minorities in the United States. [Formerly SOC 255] Status of blacks, Asians, Hispanics, and other minorities. Migration, identity and association, and strategies to improve group status and reduce intergroup tensions. Comparisons to other countries. [3] (SBS)

SOC 3703. Social Psychology of Prejudice. [Formerly SOC 262] Prejudice and its amelioration. Problems of relations between blacks and whites in the United States. [3] (SBS)

SOC 3704. Race, Gender, and Sport. [Formerly SOC 256] Manifestations of race and gender in sport. Emphasis on race and gender ideologies and the associated inequalities in sport in America. International comparisons for context. [3] (SBS)

SOC 3711. Women, Gender, and Globalization. [Formerly SOC 239] Globalization and its impact on women and gender relations. Multinational corporations, economic development, and inequality; new forms of work; human rights; feminist movements for change. [3] (INT)

SOC 3722. Gender in Society. [Formerly SOC 250] Theoretical approaches to gender relations with a focus on the contemporary U.S. Evolution of gender stereotypes, gender socialization over the life course, gender in social interactions, institutional sources of gender inequality, and intersections of gender with race, social class, and sexual identity. Topics include work, school, families, health, and intimate relationships. [3] (SBS)

SOC 3723. Gender, Sexuality, and the Body. [Formerly SOC 257] The body is a physical marker of gender and sexuality. Biological reproduction is saturated with social meanings - shaping ideas about masculinity, femininity, the gender division of labor, and heterosexuality. In this course, we will look at the body as reflexive project and as the site of historical and ideological significance. We address race, ethnicity, physical abilities, and class in explaining variations in cultural ideals. [3] (SBS)

SOC 3724. Gender Identities, Interactions, and Relationships. [Formerly SOC 272] Gender identities form and influence interactions in friendships, intimate relations, families, education, and other institutions. Changes and continuities in gender roles within the United States and ways in which race, class, and sexual orientation intersect processes of gender relations. [3] (SBS)

SOC 3851. Independent Research and Writing. [Formerly SOC 299] May be repeated for a total of 6 credits. Students may enroll in more than one section of this course each semester. [1-6; maximum of 6 credits total for all semesters of 3851] (No AXLE credit)

SOC 3880. Internship Training. [Formerly SOC 280B] Under faculty supervision, students gain experience in any of a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations. Background reading and research will be completed in Sociology 3881 concurrently with the completion of internship training, Sociology 3880. A minimum of 3 hours of 3881 must be completed with hours taken in 3880. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, completion of 6 hours of prior work in sociology, and prior departmental approval of the student's plans are required. Offered on a pass/fail basis only and must be taken concurrently with 3881. Hours of 3880 may not be included in the minimum hours counted toward the sociology major. Corequisite: 3881. [1-9] (No AXLE Credit)

SOC 3881. Internship Readings and Research. [Formerly SOC 280A] Under faculty supervision, students gain experience in any of a variety of settings, such as civic, corporate, cultural, government, health, media, political, research, and social welfare organizations. Background reading and research will be completed in Sociology 3881 concurrently with the completion of internship training, Sociology 3880. A minimum of 3 hours of 3881 must be completed with hours taken in 3880. A research paper and report must be submitted at the end of the semester during which the internship training is completed. A 2.90 grade point average, completion of 6 hours of prior work in sociology, and prior departmental approval of the student's plans are required. Corequisite: 3880. [3-6] (No AXLE credit)

SOC 4961. Seminars in Selected Topics. [Formerly SOC 294] May be repeated for a total of 6 credits if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3; maximum of 6 credits total for all semesters of 4961] (No AXLE credit)

SOC 4981. Honors Research. [Formerly SOC 296] Research and writing supervised by department staff culminating in the Senior Honors Thesis. Work consists of both background reading and active research. May be repeated for a total of 12 credits if there is no duplication in topic,

but students may earn only up to 6 credits per semester of enrollment. Open only to honors candidates. Prerequisite or corequisite: 3002. [3-6; maximum of 12 credits total for all semesters of 4981] (No AXLE credit)

Spanish

SPAN 1001. Commons iSeminar. [Formerly SPAN 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

SPAN 1100. Elementary Spanish I for True Beginners. [Formerly SPAN 100] Designed exclusively for students with no previous exposure to Spanish. Development of basic listening, speaking, reading, and writing skills with Spanish-speaking culture through a communicative approach. Conducted primarily in Spanish. Not open to students with previous training in Spanish. Four hours of classroom instruction plus one hour of independent research activities. Students continuing in Spanish take 1102. No credit for students who have already completed 1100 or have earned credit for a more advanced Spanish language course. Students wishing to repeat this course must take 1101 for repeat credit. [5] (No AXLE credit)

SPAN 1101. Elementary Spanish I. [Formerly SPAN 101] Basic listening, speaking, reading, and writing skills. Communicative approach and exposure to aspects of Spanish-speaking cultures. Conducted entirely in Spanish. Four hours of classroom instruction plus one hour of independent research activities. Intended for students with prior study of the language and a departmental placement score under 275. Serves as repeat credit for students who have completed 1100. No credit for students who have earned credit for a more advanced Spanish language course. [5] (No AXLE credit)

SPAN 1102. Elementary Spanish II. [Formerly SPAN 102] Further development of listening, speaking, reading, and writing skills using a communicative approach. Exposure to aspects of Spanish-speaking culture. Conducted entirely in Spanish. Four hours of classroom instruction plus one hour of independent research activities. Students continuing in Spanish take 2203. No credit for students who have earned credit for a more advanced Spanish language course. Prerequisite: 1100 or 1101. [5] (INT)

SPAN 1103. Intensive Elementary Spanish. [Formerly SPAN 103] A communicative approach to reading, writing, listening, and speaking for students who have studied one to three years of Spanish. Rigorous review of elementary Spanish through four hours of class instruction and one hour of independent research activities. Departmental Spanish placement exam score of 275-364. Students continuing in Spanish take 2203. No credit for students who have earned credit for 1100, 1101, or 1102. No credit for students who have earned credit for a more advanced Spanish language course. [5] (INT)

SPAN 1111. First-Year Writing Seminar. [Formerly SPAN 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

SPAN 2203. Intermediate Spanish. [Formerly SPAN 104] Development of intermediate linguistic competence in Spanish (listening, speaking, reading, and writing) using a communicative approach. Study of cultures of Spanish-speaking countries by incorporating authentic materials. Four hours of classroom instruction plus one hour of independent research activities. Intended for students who have earned credit for 1102 or 1103 or have a departmental placement score of 365-440. No credit for students who have earned credit for a more advanced Spanish language course. [5] (INT)

SPAN 2780. Intensive Spanish. [Formerly SPAN 200] A one-month intensive course in the Spanish language, meeting before regular classes begin. Emphasis is placed on conversation, reading, composition, and grammar. Offered only in the Vanderbilt in Spain program. [3] (INT)

SPAN 2990. Images of the Feminine in Spanish Cinema. [Formerly SPAN 292] Spanish national cinema from the death of Francisco Franco

to the present. Stories written, directed, and told by men about women. Taught in English with subtitled films. [3] (P)

SPAN 2995. Contemporary Latin American Prose Fiction in English Translation. [Formerly SPAN 293] Themes and techniques of the contemporary novel, novella, and short story written by both men and women in Spanish America and Brazil. No credit for graduate students in Spanish or Portuguese. [3] (HCA)

SPAN 3301W. Intermediate Spanish Writing. [Formerly SPAN 201W] Development of abilities in composition tasks related to expository writing. Focus on rhetorical techniques for organizing information, vocabulary abilities, and emphasis on collaborative work. Students write several short papers and a final long paper. Intended for students who have earned credit for 2203 or have a departmental Spanish placement exam score of 441 or higher. [3] (INT)

SPAN 3302. Spanish for Oral Communication through Cultural Topics. [Formerly SPAN 202] Development of speaking skills through the study of Spanish and Hispanic culture, and Spanish and Spanish-American current affairs. Texts drawn from contemporary articles, short stories, TV news, documentaries, and Web materials. Different registers of spoken Spanish. The development of effective strategies for oral communication. Offered on a graded basis only. Prerequisite: 3301W. Students with advanced oral skills will be placed in a higher level course. [3] (INT)

SPAN 3303. Introduction to Spanish and Spanish American Literature. [Formerly SPAN 203] Critical reading and methods of literary analysis. Selections cover all genres in several periods. Prerequisite: 3301W and 3302. [3] (HCA)

SPAN 3320. Introduction to Hispanic Cultural Studies. [Formerly SPAN 204] An examination of contemporary Hispanic culture through a variety of media (newspapers, magazines, comics, Web sites), arts, and entertainment. Prerequisite: 3301W and 3302. Not open to students who have studied abroad. [3] (INT)

SPAN 3325. The Way of Saint James. [Formerly SPAN 205] Origins and development of the Way of Saint James, or Camino de Santiago, through an examination of literature, art, history, and cultural and religious issues. Contributions from the cult of Saint James and the Way to Spanish national identity. Prerequisite: 3301W and 3302. [3] (HCA)

SPAN 3330. Cultural Studies in the Andes. [Formerly SPAN 224] Contemporary Andean culture through the lenses of anthropology and archaeology. Popular and elite artistic productions, cultural syncretism, and festive culture. Gender and society. Emphasis on hands-on learning on site. Locations include Lima, Cuzco, and Machu Picchu. Maymester only. Prerequisite: 3301W and 3302. [3] (INT)

SPAN 3340. Advanced Conversation. [Formerly SPAN 207] An intercultural approach contrasting Hispanic and American perspectives. Discussions and oral presentations on contemporary issues. For students with a high level of oral proficiency, especially those returning from a semester abroad. Offered on a graded basis only. Prerequisite: 3302. [3] (INT)

SPAN 3345. Spanish for Business and Economics. [Formerly SPAN 206] Linguistic skills and cultural information for conducting business in the Spanish-speaking world. Basic syntactic and phonological structures within the context of business. Activities to develop written, oral, and aural skills in several areas, including finance, management, marketing, and tourism. Offered on a graded basis only. Prerequisite: 3301W and 3302. [3] (INT)

SPAN 3350. Spanish for the Legal Profession. [Formerly SPAN 210] Advanced conversation course emphasizing specialized Spanish legal terminology. The development of linguistic proficiency and cultural competency. Vocabulary acquisition, grammar review, translation practice, oral presentations, and written papers. Prerequisite: 3301W, 3302, and 3303. [3] (INT)

SPAN 3355. Advanced Conversation through Cultural Issues in Film. [Formerly SPAN 208] Spanish and Latin American films as the basis for discussion and analysis of linguistic, historic, cultural, and social issues. Students are expected to have completed at least one Spanish language course beyond 3303. Prerequisite: 3301W, 3302, and 3303. [3] (INT)

SPAN 3360. Spanish Civilization. [Formerly SPAN 221] The development of Spanish culture from the Middle Ages to the present in the context of Western civilization. Discussion of historical background, literary and artistic trends, and political and socioeconomic patterns. Not open to students who have attended Vanderbilt in Spain. Prerequisite: 3301W and 3302. [3] (INT)

SPAN 3365. Film and Recent Cultural Trends in Spain. [Formerly SPAN 226] The cinema and Spanish cultural evolution during and after the Franco dictatorship. Prerequisite: 3303. [3] (INT)

SPAN 3370. Spanish American Civilization. [Formerly SPAN 223] The development of Spanish American culture from colonial times to the present; discussion of basic institutions, political and socioeconomic patterns, education, the arts, and folklore. Prerequisite: 3301W and 3302. [3] (INT)

SPAN 3375. Film and Culture in Latin America. [Formerly SPAN 227] Latin American cinema in historical perspective. Screenings, critical readings, and supplementary texts. Prerequisite: 3303. [3] (P)

SPAN 3380. The Spanish Language. [Formerly SPAN 209] An advanced grammar course with emphasis on problem constructions, stylistics, and composition. Offered only in the Vanderbilt in Spain program. [3] (INT)

SPAN 3385. Creative Writing and Advanced Grammar. Development of writing skills through advanced grammatical concepts, vocabulary, and writing techniques and the production of short stories, essays, poems, and other forms of textual discourse. Prerequisite: 3303. [3] (INT)

SPAN 3830. Spanish for the Medical Profession. [Formerly SPAN 211] Advanced conversation course incorporating linguistic skills and cultural information relevant to medical issues in the Hispanic world. Service learning with the Latino and Latina community as an important component. Prerequisite: 3301W and 3302. [3] (INT)

SPAN 3835. Latino Immigration Experience. [Formerly SPAN 243] Literature and film that depict the immigration and assimilation experiences of the main Latino groups. Service to the Latino community integral part of course work. Prerequisite: 3303. [3] (P)

SPAN 3850. Independent Study. [Formerly SPAN 289] Designed primarily for majors. Projects are arranged with individual professors and must be approved by the director of undergraduate studies before the close of registration in the semester of the project. May be repeated for a total of 12 credits over a four semester period, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 12 credits total for four semesters of SPAN 3850] (No AXLE credit)

SPAN 3880. Internship Training in Spain. [Formerly SPAN 287B] Under faculty supervision, students gain experience in public or private organizations and complete research and readings. Offered on a pass/fail basis only and must be taken concurrently with 3881. Corequisite: 3881. [1] (No AXLE credit)

SPAN 3881. Internship Readings and Research in Spain. [Formerly SPAN 287A] Under faculty supervision, students gain experience in public or private organizations, and complete research and readings. Must be taken concurrently with 3880. Corequisite: 3880. [3] (No AXLE credit)

SPAN 3891. Special Topics in Hispanic Culture. [Formerly SPAN 296] Prerequisite: 3303. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

SPAN 3892. Special Topics in Spanish Language and Linguistics. [Formerly SPAN 295] Prerequisite: 3303. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

SPAN 3893. Special Topics in Hispanic Literature. [Formerly SPAN 294] Prerequisite: 3303. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

SPAN 4300. Introduction to Spanish Linguistics. [Formerly SPAN 212] Major linguistic subsystems of the Spanish language. Morphology, syntax, phonetics and phonology. Semantics and pragmatics, dialectology, and

sociolinguistics. No previous knowledge of linguistics required. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4310. Translation and Interpretation. [Formerly SPAN 213] Theory and practice of translation and interpretation, both from English to Spanish and Spanish to English. Practical knowledge of the basic modes of translation (direct and oblique) and interpretation (sight, consecutive, and simultaneous). Emphasis on the fundamentals of translation in legal, medical, literary, business, commercial, media, sports, and other fields. Prerequisite: 3303. [3] (SBS)

SPAN 4315. Contrastive Analysis of Spanish and English. [Formerly SPAN 217] A comparison of the phonological, morphological, and syntactical structures of Spanish and English to demonstrate the similarities and differences between the linguistic systems of these two languages. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4320. Phonology. [Formerly SPAN 216] Analysis of the production, nature, and systematic function of the sounds of the Spanish language, as well as of problems frequently experienced by non-native speakers. Both standard and dialect features of Spanish are examined. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4325. Dialectology. [Formerly SPAN 214] Formation, general characteristics, distinctive features, and geographical extension of the principal dialectal regions of Spain and Spanish America. Both historical and modern dialects are considered. Emphasis on non-standard dialectal varieties of Spanish. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4330. Words and Stems. [Formerly SPAN 215] A morphological presentation of the structural principles governing the creation of noun, verb, adjective, and adverb along with an overview of the formation of the underlying stems. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4335. Morphology and Syntax. [Formerly SPAN 218] An introduction to the principles of modern Spanish morphology (word formation) and syntax (phrase structure and usage) through an analysis of the native speaker's organization of reality and use of language to reflect and to express that organization. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4340. History of the Spanish Language. [Formerly SPAN 219] Origins and evolution of the Spanish (Castilian) language. Emphasis on the phonological and morphological development of Spanish within historical and cultural contexts of the Iberian Peninsula. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4345. The Languages of Spain. [Formerly SPAN 220] Origins, development, and the contemporary sociolinguistic situation of the principal languages and dialects of Spain, including Castilian, Catalan, Galician, and Basque. Prerequisite: 3301W and 3302. [3] (SBS)

SPAN 4350. Communicating Across Cultures. [Formerly SPAN 282] Relationships among discourse, identity, and culture. Linguistic construction of ethnicity and gender. Latin American and U.S. Latino ways of speaking. Prerequisite: 3303. [3] (SBS)

SPAN 4355. Spanish in Society. [Formerly SPAN 283] Language variation and linguistic change. Regional, socioeconomic, gendered, and ethnic differences in spoken Spanish. Language as it shapes the identities of speakers. Language use in social contexts with comparisons to English. Prerequisite: 3303. [3] (SBS)

SPAN 4360. Discourse Analysis. [Formerly SPAN 285] Linguistic pragmatics. Speech acts in conversation as patterned activity rather than unpredictable behavior. Implications, presuppositions, discourse markers, and other pragmatic units. Comparisons with English. Prerequisite: 3303. [3] (SBS)

SPAN 4400. The Origins of Spanish Literature. [Formerly SPAN 231] From its beginnings to the Renaissance; the creation of a social order and a cultural tradition. Close study of three literary landmarks—*Poema del Cid*, *Libro de Buen Amor*, *La Celestina*—and other prose and poetry selections. Prerequisite: 3303. [3] (HCA)

SPAN 4405. Literature of the Spanish Golden Age. [Formerly SPAN 232] Representative works from early modern Spain, including poetry,

prose, and drama of the Renaissance and Baroque periods. Prerequisite: 3303. [3] (HCA)

SPAN 4410. Spanish Literature from the Enlightenment to 1900. [Formerly SPAN 233] Essays and Neoclassic literature. Romanticism, Realism, and Naturalism. Representative works and authors from all genres. Prerequisite: 3303. [3] (HCA)

SPAN 4415. Spanish Literature from 1900 to the Present. [Formerly SPAN 234] Representative authors and works. Prerequisite: 3303. [3] (HCA)

SPAN 4420. Spanish American Literature from the Conquest to 1900. [Formerly SPAN 235] Development of all forms from colonial times to the end of the 19th century. Patterns of interaction of Amerindian, African, and European cultural traditions. Unity and diversity of Spanish American literature. Prerequisite: 3303. [3] (HCA)

SPAN 4425. Spanish American Literature from 1900 to the Present. [Formerly SPAN 236] The works of Neruda, Borges, Paz, Garcia Márquez and others. Prerequisite: 3303. [3] (HCA)

SPAN 4440. Development of the Short Story. [Formerly SPAN 260] From early manifestations in Spain through its current forms in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

SPAN 4445. Development of the Novel. [Formerly SPAN 239] From the seventeenth century through Realism and Naturalism in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

SPAN 4450. The Contemporary Novel. [Formerly SPAN 240] New forms in the twentieth-century novel in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

SPAN 4455. Development of Drama. [Formerly SPAN 251] Spanish theatrical works from 1600 to 1900, including the Golden age comedia, neoclassicism, romanticism, and early realism in drama. Prerequisite: 3303. [3] (HCA)

SPAN 4465. The Theory and Practice of Drama. [Formerly SPAN 281] Critical works and plays from different periods. Introduction to the principles of dramaturgy. Prerequisite: 3303. [3] (HCA)

SPAN 4470. Development of Lyric Poetry. [Formerly SPAN 230] Popular and traditional forms; the sonnet and other Renaissance and Baroque classical forms. Romanticism. Prerequisite: 3303. [3] (HCA)

SPAN 4475. Contemporary Lyric Poetry. [Formerly SPAN 237] From Modernism to the present in Spain and Spanish America. Prerequisite: 3303. [3] (HCA)

SPAN 4550. The Theory and Practice of Literary Translation. [Formerly SPAN 271] Theoretical approaches and their consequences for the interpretation of translated texts. Practical application of these principles in the translation of both Spanish and Portuguese texts into English. Taught in Spanish. Written work in Spanish or Portuguese. Prerequisite: 3303. [3] (HCA)

SPAN 4620. Love and Honor in Medieval and Golden Age Literature. [Formerly SPAN 256] The evolution of the key themes of love and honor in works from various genres of medieval and Golden Age Spanish literature with special attention to sociohistorical context. Prerequisite: 3303. [3] (HCA)

SPAN 4640. Don Quixote. [Formerly SPAN 246] Directed reading and intensive study of the novel. Prerequisite: 3303. [3] (HCA)

SPAN 4670. Spanish Realism. [Formerly SPAN 258] Methods of, implications to, and pitfalls of creating realistic characters in nineteenth-century Spanish novels. Prerequisite 3303. [3] (HCA)

SPAN 4690. Alterity and Migration in Spain. [Formerly SPAN 264] Historical and literary texts about nationalism and cultural difference. Representations of contact with Africa, the Americas, and Asia; regional identities; immigration; gender and racial issues. Prerequisite: 3303. [3] (P)

SPAN 4720. Literary Genres and National Identities in Latin America. [Formerly SPAN 277] A comparative approach to the rise of the national literary traditions from independence to the latter half of the twentieth century. Indigenist novels, abolitionist narratives, and gaucho poetry by colonial

figures, including African slaves, indigenous peoples, and Argentine Gauchos. Prerequisite: 3303. [3] (P)

SPAN 4725. Jungle Narratives in Latin America. From the colonial period to the present. Evolution of the representation of the jungle. Prerequisite: 3303. [3] (HCA)

SPAN 4730. Modern Latin American Poetry. [Formerly SPAN 273] Development of poetry in Spanish America and Brazil during the twentieth century. Major poets and movements, including both Spanish American Modernismo and Brazilian Modernismo. Poetry as a genre; composition and discussion of students' poetry. Taught in Spanish. Prerequisite: 3303. [3] (HCA)

SPAN 4740. Spanish-American Literature of the Boom Era. [Formerly SPAN 247] The Boom novel of the 1960s: Carlos Fuentes' *La muerte de Artemio Cruz*, Julio Cortázar's *Rayuela*, Mario Vargas Llosa's *La ciudad y los perros*, Guillermo Cabrera Infante's *Tres tristes tigres*, and Gabriel García Márquez's *Cien años de soledad*. Prerequisite: 3303. [3] (HCA)

SPAN 4741. Spanish-American Literature of the Post-Boom Era. [Formerly SPAN 248] The post-Boom novel from the 1970s to the present; analysis of related films. Manuel Muig's *Boquitas pintadas*, *Me llamo Rigoberta Menchú*, Laura Esquivel's *Coma agua para chocolate*, Reinaldo Arená's *Viaje a La Habana*, and Daisey Rubiera Castillo's *Reyita, sencillamente*. Prerequisite: 3303. [3] (P)

SPAN 4750. Afro-Hispanic Literature. [Formerly SPAN 244] From nineteenth-century slave narrative to modern writers such as Miguel Barnet, Alejo Carpentier, and Quince Duncan. Prerequisite: 3303. [3] (P)

SPAN 4755. Latina and Latin American Women Writers. [Formerly SPAN 275] Contemporary writing of women in Latin America and of Latinas in the United States. Representation of sexuality and the maternal body. Prerequisite: 3303. [3] (P)

SPAN 4760. Literature and Medicine. [Formerly SPAN 274] Modern intersections of literature and medicine in Latin America. From the social hygiene literature of the nineteenth century to the autobiographical disease narrative of the late twentieth century. Prerequisite 3303. [3] (P)

SPAN 4765. Latin American Fiestas: Mexico, The Andes, and the Caribbean. Comparative analysis of the celebration phenomenon as a stark contrast to everyday reality. Festive integration of Amerindian, African, and European legacies embedded in the identity of three Latin American regions. Colonial and contemporary texts, paintings, and film. Serves as repeat credit for SPAN 3893 Section 01 in Fall 2017. Prerequisite: 3303. [3] (P)

SPAN 4810. Images of the City. [Formerly SPAN 263] Literary representations of cityscapes in Spain and Latin America. Prerequisite: 3303. [3] (HCA)

SPAN 4980. Undergraduate Seminar. [Formerly SPAN 280] Close contextual readings of major Hispanic literary texts through selected critical approaches. Open to junior and senior majors in Spanish; required of candidates for honors. Prerequisite: 3303. [3] (HCA)

SPAN 4998. Senior Honors Thesis. [Formerly SPAN 299A] [3] (No AXLE credit)

SPAN 4999. Senior Honors Thesis. [Formerly SPAN 299B] [3] (No AXLE credit)

Theatre

THTR 1001. Commons iSeminar. [Formerly THTR 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

THTR 1010. Fundamentals of Theatre. [Formerly THTR 100] An introduction to the various elements that combine to form a theatrical experience; the development of critical standards to judge these elements in performance. Not open to students who have earned credit for THTR 1111. Total credit for this course and THTR 1111 will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Repeat credit for students who have completed 1010W. [3] (HCA)

THTR 1010W. Fundamentals of Theatre. [Formerly THTR 100W] An introduction to the various elements that combine to form a theatrical experience; the development of critical standards to judge these elements in performance. Not open to students who have earned credit for THTR 1111. Total credit for this course and THTR 1111 will not exceed 3 hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. Repeat credit for students who have completed 1010. [3] (HCA)

THTR 1111. First-Year Writing Seminar. [Formerly THTR 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

THTR 1611. Acting I. [Formerly THTR 219] The role of the actor in the theatre with emphasis on artistic self-expression through improvisation and development of performance skills. Available on a graded basis only. [3] (HCA)

THTR 1711. Introduction to Theatrical Production. [Formerly THTR 110] Contemporary concepts, methods, and practices employed in the planning and implementation of stage scenery and lighting. Communication, creative problem solving, and organizational management through research, lecture, and class discussion. [4] (HCA)

THTR 1741. Art of Scene Painting. [Formerly THTR 112] Concepts, methods, and practices in scenic artistry. Contemporary and historical examples. Impact on theatrical design and production. [3] (HCA)

THTR 1751. Fundamentals of Theatre Design. [Formerly THTR 111] Roles and skills of scenic, costume, and lighting designers. Critical assessment of design quality. Elements and principles of design, script analysis, dramaturgical and visual research, color theory and practice. [4] (HCA)

THTR 1811. Marshals, Mobsters, Monsters, Magnums, and Musicals: American Movie Genres. [Formerly THTR 171] Western, gangster, horror, private eye, and musical genres. Representative films from each category reflecting the evolution of the genre and the changing American landscape. [3] (US)

THTR 2201. Histories of Theatre and Drama I: Ritual and World Performance. [Formerly THTR 201] Including festivals of ancient Greece, Rome, Medieval Europe, and Mesoamerica; Japanese Noh, Kabuki, and Bunraku; African dance and postcolonial theatre. [3] (INT)

THTR 2202W. Histories of Theatre and Drama II: The European Stage. [Formerly THTR 202W] Including the Italian Renaissance, French neoclassicism, English Restoration, German and French romanticism, and the modernist movements of realism, symbolism, Dada and futurism, expressionism, epic theatre, and absurdism. [3] (INT)

THTR 2204. Histories of Theatre and Drama III: The U.S. Stage. [Formerly THTR 204] Including British colonial and revolutionary drama; frontier theatre; melodrama; minstrelsy, vaudeville, burlesque, and the musical stage; pageantry and community theatre; postwar realism; African-American, Chicana/o, feminist, and Asian-American theatre movements. [3] (US)

THTR 2311W. Writing for the Stage and Screen. Techniques for writing plays and screenplays with critical attention to dramatic themes and characterization. [3] (HCA)

THTR 2651. Play Direction. [Formerly THTR 230] Play direction as an aid to critical understanding and appreciation of the theatre. Development of techniques. Prerequisite: 1611. [3] (HCA)

THTR 2781. The History of Fashion. [Formerly THTR 216] Men's and women's fashion from ancient times to the present. Women's roles in society as reflected in their clothing. [3] (P)

THTR 3201W. Contemporary Drama and Performance Criticism. [Formerly THTR 206W] Dramatic literature and performance theory. Advanced techniques in writing performance criticism. Prerequisite: at least sophomore standing and 1010, 1010W, or 1111. [3] (P)

THTR 3207. Storytelling as Performance. Multiple cultural traditions, including the development and practice of oral language skills. [3] (HCA)

THTR 3281. Theatre in London. [Formerly THTR 280] Intensive overseas summer study program in contemporary British theatre. Ten productions in London covering a broad spectrum of theatrical offerings. Weekly seminars with artists and administrators from the British professional stage. [3] (P)

THTR 3282. Theater and Performance in the United Kingdom. Maymester abroad. Performing arts scenes of London, Glasgow, and Edinburgh. Contemporary British theatre: state-funded, commercial, and independent artistry. Performance styles and traditions. [3] (HCA)

THTR 3311. Playwriting. [Formerly THTR 225] Instruction in writing plays with critical attention to dramatic themes and characterization. Prerequisite: 1010, 1010W, or 1111 and consent of the instructor. [3] (HCA)

THTR 3600. Rehearsal-Acting. [Formerly THTR 221] Students performing major roles in university theatre productions may receive 1 credit hour per role at the discretion of the director. Full character analysis and periodic reports of rehearsal progress are required. Prerequisite: 3611. May be repeated for a total of 3 credits, but students may earn only up to 2 credits per semester of enrollment. [1-2; maximum of 3 credits total for all semesters of THTR 3600] (No AXLE credit)

THTR 3611. Acting II. [Formerly THTR 220] The actor's role in the theatre with emphasis on acting as character interpretation and ensemble performance through analysis and scene study. Offered on a graded basis only. Prerequisite: 1611. [3] (HCA)

THTR 3651. Intermediate Play Direction. [Formerly THTR 231] Development of theoretical and practical approaches to directing dramatic texts. Emphasis on research, interpretation, and communication. Prerequisite: 2651. [3] (HCA)

THTR 3700. Rehearsal-Production. [Formerly THTR 211] Students performing major technical assignments in university theatre productions may receive 1 credit hour per assignment at the discretion of the technical director. Detailed plans of expected work and full reports on all crew sessions are to be submitted. May be repeated for a total of 3 credits, but students may earn only up to 2 credits per semester of enrollment. Prerequisite: consent of instructor. [1-2; maximum of 3 credits total for all semesters of THTR 3700] (No AXLE credit)

THTR 3721. Elements of Basic Design: Scenery and Props. [Formerly THTR 212] Aesthetics and processes. Development and communication of design ideas through script analysis, research, virtual and physical model-building. Contemporary scenic practices. Prerequisite: 1711. [4] (HCA)

THTR 3741. Elements of Basic Design: Costuming and Makeup. [Formerly THTR 214] Aesthetics and processes. Development and communication of design ideas through the drawing and rendering of the costumed figure. Prerequisite: 1711 or 2781. [4] (HCA)

THTR 3761. Elements of Basic Design: Lighting and Sound. [Formerly THTR 213] Aesthetics and processes. Development and communication of design ideas through script analysis and research. Lighting and audio theory and practice. Contemporary lighting and audio technology. Prerequisite: 1711. [4] (HCA)

THTR 3781. Management in the Theatre. [Formerly THTR 218] Roles of theatre and stage managers. Tools and methods. Organizational theories and skills. Prerequisite: 1711. [3] (HCA)

THTR 3851. Independent Study. [Formerly THTR 289] A research project in selected aspects of theatre and drama to be arranged with the instructor. [Variable credit: 1-3] (No AXLE credit)

THTR 3891. Selected Topics in Theatre. [Formerly THTR 294] Intensive study of a particular area of theatre. Emphasis on personal investigation and written reports. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

THTR 4201. Shakespeare in the Theatre. [Formerly THTR 232] Selected plays and scenes. Theoretical and practical exploration of script, theatre, and audience in terms of production, past and present. [3] (HCA)

THTR 4611. Problems of Acting Style. [Formerly THTR 223] Advanced scene study, investigating methods used today to perform drama of past

eras which used non-realistic styles. Offered on a graded basis only. Prerequisite: 3611. [3] (HCA)

THTR 4961. Senior Seminar: Performance Ensemble. [Formerly THTR 261] Advanced development of artistic, communicative, and organizational skills required to create theatre. Culminates in a public performance. Open to senior majors only. Prerequisite: 1010, 1010W, or 1111; 1711; 1751; 1611; and 2651. [3] (HCA)

THTR 4998. Senior Honors Thesis. [Formerly THTR 299A] Independent research and completion of an honors thesis, done in consultation with a member of the faculty in Theatre. Open only to those who qualify to begin departmental honors work in Theatre. [3] (No AXLE credit)

THTR 4999. Senior Honors Thesis. [Formerly THTR 299B] Independent research and completion of an honors thesis, done in consultation with a member of the faculty in Theatre. Open only to those who qualify to begin departmental honors work in Theatre. [3] (No AXLE credit)

Tibetan

TBTN 1101. Elementary Tibetan I (UVA). Grammar and syntax of spoken and written Tibetan. Listening, speaking, reading, and writing from Tibetan short stories, proverbs, and other sources. Tibetan culture. Offered on a graded basis only. [4] (No AXLE credit)

TBTN 1102. Elementary Tibetan II (UVA). Grammar and syntax of spoken and written Tibetan; listening, speaking, reading and writing. Examples from Tibetan short stories and proverbs, among other sources. Exposure to Tibetan culture to improve communication skills, using a dynamic, interactive format. Offered on a graded basis only. Prerequisite: 1101. [4] (INT)

TBTN 2201. Intermediate Tibetan I (UVA). Grammar and syntax of spoken and written Tibetan. Listening, speaking, reading, and writing through the integrated use of spoken and literary forms. Enhanced knowledge of Tibetan culture. Offered on a graded basis only. [4] (INT)

TBTN 2202. Intermediate Tibetan II (UVA). Grammar and syntax of spoken and written Tibetan; listening, speaking, reading and writing through spoken and literary forms. Further study of Tibetan culture to improve communication skills. Offered on a graded basis only. Prerequisite: 2201. [4] (INT)

Women's and Gender Studies

WGS 1001. Commons iSeminar. [Formerly WGS 99] Topics vary. General Elective credit only. [1] (No AXLE credit)

WGS 1111. First-Year Writing Seminar. [Formerly WGS 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through intensive class discussion, oral presentations, and written expression. May be repeated for credit once if there is no duplication of topic, but students may earn only up to 3 credits in any 1111 course per semester of enrollment. [3; maximum of 6 credits total for all semesters of 1111] (AXLE credit category varies by section)

WGS 1150. Sex and Gender in Everyday Life. [Formerly WGS 150] Sex and gender roles in culture and society. Gender, race, and class. Women and men in literature, art, culture, politics, institutions. Repeat credit for students who have completed 1150W. [3] (P)

WGS 1150W. Sex and Gender in Everyday Life. [Formerly WGS 150W] Sex and gender roles in culture and society. Gender, race, and class. Women and men in literature, art, culture, politics, institutions. Repeat credit for students who have completed 1150. [3] (P)

WGS 1160. Sex and Society. [Formerly WGS 160] Historical, cultural, and social contexts of sexual diversity, discrimination, and sexual violence. Understanding the centrality of sexuality to identity; challenging harmful modes of sexual expression; developing critical awareness of sex and sexuality. [3] (P)

WGS 1272. Feminism and Film. [Formerly WGS 272] Images of gender and race; techniques, sound, lighting, cinematography in relation in gender. Prerequisite: 1150 or 1150W or 1160. [3] (US)

WGS 2225. Women in Popular Culture. [Formerly WGS 200] Gender differentiation in popular culture and mass-market products. Portrayal of women in movies, print, music, and the Internet. The sources and effects of these portrayals. Women as both consumers and the consumed. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 2234. Women in Judaism. Judaism and feminism. Women in the Hebrew Bible, Jewish law, natural philosophy, and history. Case studies in Jewish medieval and modern contexts; problems of assimilation and cultural specificity in modern society. [3] (INT)

WGS 2235. Women in Israel. Status and experiences of Jewish and non-Jewish women living in Israel. Religion and the law; Jewish and non-Jewish minorities; women and the military; women's health; violence against women; the Palestinian/Israeli conflict. [3] (INT)

WGS 2240. Introduction to Women's Health. [Formerly WGS 240] How culture influences women's health, body image, self esteem. Issues include fertility control and child bearing, medical innovations to detect disease, alternative therapies, psychological well-being, sexuality, physical and sexual abuse. Impact of politics on health options for women. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 2242. Women Who Kill. [Formerly WGS 242] Examination of classical and contemporary representations of women who kill. [3] (P)

WGS 2243. Sociologies of Men and Masculinity. [Formerly WGS 243] Traditional and emerging perspectives on masculinity and male gender-roles. Emphasis on relationship between social forces and males' everyday experiences across the life-span. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 2244. The Body, Culture, and Feminism. The body as a cultural, social, and historical construction. Western culture and narratives of "normalcy" and their impact on identity and representation. Body image and eating disorders. Cultural politics of size, weight, and shape. Disability. Cosmetic surgery. Prerequisite: 1150, 1150W, or 1160. [3] (P)

WGS 2248. Humor and Cultural Critique in Fannie Flagg's Novels. [Formerly WGS 248] Humor used to address cultural issues in Southern small-town America from 1920-1970. Gender, race, community, and feminism in Fannie Flagg's novels. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 2249. Women and Humor in the Age of Television. [Formerly WGS 249] The period 1950 to present. Television variety shows, sitcoms, and stand-up comedy as media for promoting women's humor and feminism. Comedy as a means of dealing with difficult personal and social issues. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 2252. Sex and Scandals in Literature. [Formerly WGS 252] From the eighteenth century to the present. Women's and men's disorderly conduct as represented in literary texts. Charlotte Rowson, Kate Chopin, Edith Wharton, Henry James, and Toni Morrison. [3] (HCA)

WGS 2254. Feminist Fictions. [Formerly WGS 254] From the nineteenth century to the present. Feminist ideas and ideals as represented in literary texts. Kate Chopin, Edith Wharton, Virginia Woolf, Alice Walker, and Margaret Atwood. [3] (HCA)

WGS 2256. Literary Lesbians. From the nineteenth century to the present. How girls' and women's intimacies are monitored and policed in literature and culture. Impact of race, class, religion, and disability on expression and reception of relationships. [3] (HCA)

WGS 2259. Reading and Writing Lives. [Formerly WGS 259] Interdisciplinary exploration of life-stories as narratives. Strategies of self-representation and interpretation, with particular attention to women. Includes fiction, biography, autobiography, history, ethnography, and the writing of life-story narratives. Repeat credit for students who have completed 2259W. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 2259W. Reading and Writing Lives. [Formerly WGS 259W] Interdisciplinary exploration of life-stories as narratives. Strategies of self-representation and interpretation, with particular attention to women. Includes fiction, biography, autobiography, history, ethnography, and the writing of life-story narratives. Repeat credit for students who have completed 2259. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 2262. Gender and Ethics. [Formerly WGS 262] Religious world-views connected to moral traditions. Epistemological and ethical systems and their relationship to gender and patriarchy. Social construction of gender; violence against women; feminism; and difference. [3] (P)

WGS 2267. Seminar on Gender and Violence. [Formerly WGS 267] In-depth study of violence against women, with a service-learning component in a community setting. Topics include domestic abuse, rape, sexual harassment, pornography, and global violence. Focus on problems and potential solutions, examining violence on a societal, institutional, and individual level, interrogating the “personal as political,” and exposing power structures that shape our communities. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 2268. Gender, Race, Justice, and the Environment. [Formerly WGS 268] Gender and racial aspects of environmental degradation. Risk, activism, health and illness, policy and politics. Prerequisite: 1150 or 1150W or 1160. [3] (SBS)

WGS 2270. Ecofeminism: Theory, Politics, and Action. [Formerly WGS 270] Interconnections among the exploitation of nature, the oppression of women, and the abuse of resources that have led to the current global ecological crisis. [3] (SBS)

WGS 2610. Womanism in Global Context. Survey of global Womanist (Black Feminist) theory and praxis. Race, class, sexuality, spirituality, and activism. Controversies over female bodies. [3] (INT)

WGS 2612. Lesbian, Gay, Bisexual, and Transgender Studies. [Formerly WGS 212] Introductory study of sexual identity, queer theory, relationships, politics. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 2613. Compulsory Couplehood. From the nineteenth century to the present. Legal and societal implications of marriage. Marginalization of the single person. Different gendered stereotypes of the uncoupled adult, including the bachelor and the spinster. Non-normative forms of kinship and relationships. Primarily United States with global perspectives. Scholarly and pop-cultural texts. [3] (P)

WGS 2614. Cowboys, Gangsters, and Drag Kings: Introduction to Critical Masculinity Studies. Critical examination of representations of masculinity in patriarchal societies. Constructed nature of masculinity in relation to race, sexuality, class, national, and religious identifications. Historical, sociological, literary, cinematic, and visual art analyses. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 2615. Transgender Lives in Literature and Film. Global study of transgender representation in film and literature. Cultural theory approach, utilizing work from the fields of transgender, queer, feminist, and disability studies. Prerequisite: 1150 or 1150W or 1160. [3] (HCA)

WGS 3030. Feminist Disability Studies. Disability through a feminist lens. Changes in the meaning of disability over time and across cultures. Intersectional focus on gender, race, ethnicity, class, age, sexuality, and nationality. Embodiment, eugenics, performance, social movements, and violence. [3] (P)

WGS 3201. Women and Gender in Transnational Context. [Formerly WGS 201] Gender as a social construction. Feminist critiques of knowledge, family and work, sexuality, health and medicine, and the women’s movement. The future of feminism in global context. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 3246W. Women’s Rights, Women’s Wrongs. [Formerly WGS 246W] Intellectual and theoretical foundations for contemporary feminist theory and politics in the United States, based upon works by nineteenth- and twentieth-century authors. Prerequisite: 1150 or 1150W or 1160. [3] (US)

WGS 3250. Contemporary Women’s Movements. [Formerly WGS 250] Recent feminist history. The origins and parameters of women’s movements from the 1960’s to the present. Repeat credit for students who have completed 3250W. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 3250W. Contemporary Women’s Movements. [Formerly WGS 250W] Recent feminist history. The origins and parameters of women’s

movements from the 1960’s to the present. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 3265. Human Rights in Activism. Role of human rights in struggles against injustice. Identification of key problems of injustice addressed by a human rights framework. Problems with human rights as a tool for activism. Discussion in contemporary politics. Intellectual and legal traditions that have developed around human rights. No credit for students who have earned credit for PSCI 3896 section 01 offered fall 2016. Offered on a graded basis only. [3] (P)

WGS 3271. Feminist Legal Theory. [Formerly WGS 271] Theoretical issues about the interaction between law and gender. Application of feminist analysis and perspective to law relating to family, work, criminal law, reproductive freedom, pornography, and sexual harassment. Prerequisite: 11150 or 1150W or 1160. [3] (P)

WGS 3273. Seminar on Psychoanalysis and Feminism. [Formerly WGS 273] Historical and contemporary perspectives on the long and ambivalent relationship between psychoanalysis and feminism. Trauma, hysteria, narcissism, gender, and the family. Prerequisite: 1150 or 1150W or 1160. [3] (P)

WGS 3281. Globalization and Policy-Making. [Formerly WGS 281] Western historical conceptualizations of the state. Socio-political contexts. Prerequisite: 1150 or 1150W or 1160. [3] (INT)

WGS 3303. Feminist Disability Studies. Gender, disability, and the body. Theories of disability, performance arts, eugenics, disability rights movement, and technology. Intersectional analysis of disability alongside race, ethnicity, sexuality, and class. Memoir, history, qualitative research, and literary analysis. [3] (P)

WGS 3850. Independent Study. [Formerly WGS 289] A program of reading and research for advanced students in an area of women’s and gender studies arranged in consultation with an adviser. Prerequisite: 1150 or 1150W. May be repeated for a total of 6 credits if there is no duplication in topic, but students may earn only up to 3 credits per semester of enrollment. [1-3; maximum of 6 credits total for all semesters of WGS 3850] (No AXLE credit)

WGS 3880. Internship Training. [Formerly WGS 288A] Under faculty supervision, students gain experience combining theoretical and practical work in a project related to social change and focused on women, feminism, or gender. Legislative, community, educational, or non-profit settings. Internship plan developed between student and faculty sponsor, with approval of Women’s and Gender Studies program director. A thorough report and research paper are submitted at the end of the semester. Must be taken on a Pass/Fail basis only and must be taken concurrently with 3882 and/or 3883. These hours may not be included in the minimum hours required for the women’s and gender studies major. Prerequisite: 3201 and one other 2000-level (or higher) Women’s and Gender Studies course, and a 2.90 grade point average. Corequisite: 3882 and/or 3883. [1-9] (No AXLE credit)

WGS 3882. Internship Readings. [Formerly WGS 288C] Under faculty supervision, students gain experience combining theoretical and practical work in a project related to social change and focused on women, feminism, or gender. Legislative, community, educational, or non-profit settings. Internship plan developed between student and faculty sponsor, with approval of Women’s and Gender Studies program director. A thorough report and research paper are submitted at the end of the semester. Prerequisite: 3201 and one other 3000-level Women’s and Gender Studies course, and a 2.90 grade point average. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit)

WGS 3883. Internship Research. [Formerly WGS 288B] Under faculty supervision, students gain experience combining theoretical and practical work in a project related to social change and focused on women, feminism, or gender. Legislative, community, educational, or non-profit settings. Internship plan developed between student and faculty sponsor, with approval of Women’s and Gender Studies program director. A thorough report and research paper are submitted at the end of the semester. Prerequisite: 3201 and one other 2000-level (or higher) Women’s and Gender

Studies course, and a 2.90 grade point average. Corequisite: 3880. [Variable credit: 1-3] (No AXLE credit)

WGS 3891. Special Topics: Topics in Gender, Culture, and Representation. [Formerly WGS 294A] Topics vary. Prerequisite: 1150 or 1150W or 1160. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

WGS 3892. Special Topics: Topics in Gender, Society, and Political Economy. [Formerly WGS 294B] Topics vary. Prerequisite: 1150 or 1150W or 1160. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

WGS 3893. Selected Topics. [Formerly WGS 295] Topics vary. Prerequisite: 1150 or 1150W or 1160. May be repeated for credit more than once if there is no duplication in topic. Students may enroll in more than one section of this course each semester. [3] (No AXLE credit)

WGS 4960. Senior Seminar. [Formerly WGS 291] Advanced reading and research. Prerequisite: 1150 or 1150W or 1160. [3] (No AXLE credit)

WGS 4970. Sexing the Archive: Research Methods in Women's and Gender Studies. Conducting research through a feminist and queer lens. Archival research; examining oral histories using specialized Vanderbilt resources, as well as other local and online archives. Offered on a graded basis only. Prerequisite: 1150, 1150W, or 1160. [3] (HCA)

WGS 4998. Honors Research. [Formerly WGS 298] Reading and research under the guidance of a faculty supervisor. Consent of both the faculty supervisor and the director of Women's and Gender Studies program required. Open only to honors candidates. May be repeated for a total of 6 credits if there is no duplication in topic. [3-6; maximum of 6 credits total for all semesters of WGS 4998] (No AXLE credit)

WGS 4999. Honors Thesis. [Formerly WGS 299] Open only to seniors in the Women's and Gender Studies Honors Program. May be repeated for a total of 6 credits if there is no duplication in topic. [3-6; maximum of 6 credits total for all semesters of WGS 4999] (No AXLE credit)

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Undergraduate School Catalog





Blair School of Music

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Blair School of Music

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CONNIE HEARD, Strings, Guitar, and Harp
PETER KOLKAY, Woodwinds
DOUGLAS SHADLE, Musicology/Ethnomusicology
GAYLE SHAY, Voice
MARIANNE PLOGER, Musicianship
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Faculty Coordinators

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JOSHUA MCGUIRE, Director of Faculty Affairs
RYAN MIDDAGH, Jazz Studies
CRYSTAL PLOHMAN, Folk Instruments
PAMELA SCHNELLER, Precollege Scholarships
MICHAEL HIME, Music as a Second Major
ZACHARY EBIN, Suzuki Program

Committees

For a list of committees, please visit blair.vanderbilt.edu.

Faculty

For a list of current faculty, please visit virg.vanderbilt.edu/webtools/registry.

Music at Vanderbilt

BLAIR School of Music serves as the focal point at Vanderbilt for the study of music as a human endeavor and as a performing art. The school contributes to the quality of life at the university through concerts, lectures, and recitals by faculty, students, and visiting artists, scholars, and composers, and through course offerings in performance, musicology/ethnomusicology, composition, and theory. In an age of increasing technology and social complexity, music offers to persons of all ages a vital medium for the expression of the human spirit.

The Blair School has been an integral part of Nashville's musical environment since its founding in 1964 by the Justin and Valere Potter Foundation through a bequest of Valere Blair Potter. In 1981 the school was merged with Vanderbilt following the university's decision to develop an excellent program in music. Studies leading to the professional bachelor of music in performance were initiated in 1986.

The Bachelor of Music degree program includes majors in performance, composition, and integrated studies. The performance major is available in any orchestral instrument, piano, saxophone, euphonium, and voice. The major in composition emphasizes analytical skills as well as the development of students' creativity. The integrated studies major combines the study of composition or a performance area with an additional concentration in music. The integrated studies major also forms the basis for a five-year program in teacher education offered cooperatively with Peabody College. In the Bachelor of Musical Arts degree program, composers and performers complete an in-depth music study in addition to a field outside of music. All Blair degree programs are accredited by the National Association of Schools of Music (NASM).

A non-professional 31-hour liberal arts music major makes it possible for students outside the Blair School to choose music as a second major. Students in other schools and colleges of the university also may pursue a minor in music, music composition, musicology/ethnomusicology, or music performance. And Blair offers a remarkable variety of electives for students who wish to enrich their studies with credit in music courses, ensembles, or performance instruction, or to select music as an extracurricular activity.

Blair School of Music is home to internationally known faculty soloists and ensembles, and Blair's performers, composers, ethnomusicologists, and musicologists are among the most respected in their fields. Members of the faculty ensembles (Blair String Quartet, Blair Woodwind Quintet, Blair Brass Quintet, and Blakemore Trio) provide private instruction and coach chamber music ensembles and performance classes. The faculty's dedication to teaching and a low student/faculty ratio provide students the personal attention that fosters maximum musical growth and understanding. The school is committed to its goal of developing students who are among the most articulate, culturally aware, and artistically sensitive of any graduates in the country.

Facilities

The Blair building incorporates innovative developments in acoustical design and engineering. It contains teaching studios and faculty offices, classrooms, rehearsal halls, practice rooms,

library, administrative offices, composition and keyboard labs with individual computer workstations, and concert venues. The 272-seat Steve and Judy Turner Recital Hall is the locus for student recitals and concerts and master classes by faculty members and visiting artists held on a regular basis. It also houses the Dobson Organ Opus 92 (2014), designed in the tradition of eighteenth-century eastern German organs not unlike those Bach knew, with additions and accommodations for twenty-first century use. Opened in spring 2002, the 609-seat Ingram Hall garnered immediate acclaim for its superb acoustics, its visual beauty, and its enhancement of the school's ability to host and produce orchestra, opera, and other major concert events.

The Anne Potter Wilson Music Library is a division of the Jean and Alexander Heard Libraries. The collection, begun in 1947, was moved from Peabody College to its new and permanent home at Blair in the summer of 1985. Named to honor Anne Potter Wilson by the Vanderbilt Board of Trust in 1987, the 12,000-square-foot library holds more than 110,000 books, scores, sound and video recordings, and subscriptions to journals and online music databases. It is equipped with a seminar room, listening and viewing stations, computer workstations, and study facilities. A variety of equipment is available for check out including laptops, microphones, phone chargers, midi keyboards, headphones, and umbrellas. Music librarians and staff are available to assist users with music research and finding resources for performance, study, or instruction.

Accreditation

All programs leading to B.Mus. and B.Mus.Arts degrees are accredited by the National Association of Schools of Music, 11250 Roger Bacon Drive, Suite 21, Reston, VA 20190-5248; telephone: (703) 437-0700.

Classes for the General Student

The Blair School of Music welcomes the general student into its classes and studios. A large number of courses are designed specifically for non-majors. Many classes are held in Sarratt Cinema, Alumni Hall, and other central campus locations. Non-majors may also participate in any and all music major courses for which they are qualified.

A wide variety of music courses fulfill liberal arts core requirements for undergraduates in the College of Arts and Science, the School of Engineering, and Peabody College. These are listed by course numbers in each school's/college's section of this catalog, where requirements outlining Arts and Science AXLE, Engineering liberal arts core, or Peabody liberal education core requirements are given. Requirements and the courses which fulfill them differ for each Vanderbilt school.

Courses of particular interest to the general student are:

*First-Year Writing Seminars**

Music and Modernism	MUSL 1111 [W, HCA]
Shakespeare and Music	MUSL 1111 [W, HCA]

Music Composition and Theory

Music Theory (Survey of)	MUTH 1200-1210
Nashville Number System, The	MUTH 1130

Songwriting and Elements of Music Theory	MUTH 1120
Songwriting II	MUTH 1125
Advanced Lyric Writing for Songwriters	MUSO 1230

*Musicology and Ethnomusicology**

African Music	MUSL 1105 [INT]
American Music	MUSL 2600 [US]
American Popular Music Artist, Community, and Democracy	MUSL 3213 [SBS]
Blues, The	MUSL 1630 [US]
Choral Music (Survey of)	MUSL 1230 [HCA]
Country Music	MUSL 1640 [US]
DIY Movements: Hip Hop, Punk, and the Democratization of America's Pop	MUSL 2620
Exploring the Film Soundtrack Introduction to Music Literature	MUSL 2329 [US]
Jazz (Survey of)	MUSL 1200 [HCA]
Love and Death in Music	MUSL 1620 [US]
Music City Museums and Memorabilia	MUSL 1310 [HCA]
Music, Gender, and Sexuality	MUSL 1660 [HCA]
Music, Identity, and Diversity	MUSL 3150 [P]
Music of the South	MUSL 2150 [P]
Music, the Arts, and Ideas	MUSL 2610 [US]
Musical Theatre in America	MUSL 1300 [HCA]
Opera	MUSL 1610 [HCA]
Rock Music (History of)	MUSL 3220, 3221 [HCA]
Symphony, The	MUSL 1650 [HCA]
Women and Music	MUSL 1220 [HCA]
Women and Rock Music	MUSL 3155 [P]
World Music	MUSL 3160 [HCA]
	MUSL 1100 [INT]

Other Courses

Building Communities Through Music and the Arts	MENT 1130
Arts Administration	MENT 1135
Creating Mission-Driven Arts and Social Programming	MENT 1140
Business of Music, The	MENT 1120
Music Internships	MENT 3880, 3881, 3882

*The bracketed letters indicate categories of the Arts and Science AXLE curriculum, which may also be verified in the Arts and Science section of the catalog. These designations are as follows: Humanities and the Creative Arts [HCA]; International Cultures [INT]; History and Culture of the United States [US]; Social and Behavioral Sciences [SBS]; and Perspectives [P].

Composition/Theory, Musicianship, and Keyboard Harmony

Courses designed for the general university student (MUTH 1120, 1125, 1200, 1210) focus on the recognition of stylistic and structural patterns. This skill enhances the non-technical listener's awareness—both analytical and affective—of creative expression in music.

The music theory and musicianship sequence (MUTH 2100-2400; MUSC 2100-2400) introduces serious students of music, whether majors or not, to the principles of harmony, voice-leading, counterpoint, structure, and analytical/compositional techniques in a variety of historical styles; further, it fosters the all-important skills of hearing tonal relationships with facility and of communicating orally the structures and materials of music.

Ensembles

The Blair School of Music sponsors several major performing ensembles, including the Vanderbilt Symphonic Choir, Vanderbilt Chorale, Orchestra, Wind Symphony, Opera Theatre, and Blair Big Band. Other non-western and vernacular ensembles, such as the African Performing Ensemble and the Steel Drum/Pan Ensemble, are also available for credit. A large number of smaller ensembles and chamber music groups also exist, offering students a wide variety of experiences.

Auditions. Auditions for the major performing ensembles are held at the beginning of each semester. Audition information can be found on the Blair School of Music website. Students must audition every semester unless excused. Assignment is at the discretion of the director. Openings at mid-year are not guaranteed. Students need the approval of the appropriate faculty chamber music coordinator before enrolling in chamber music; if participation has not been discussed with the coach, students may register tentatively for the "to be assigned" section of chamber music. Openings are not guaranteed.

Credit. Students may register for course credit. Audit status or registration for zero hours may be possible with permission of the director and the associate dean of the student's school or college.

Musicology and Ethnomusicology

Courses in musicology and ethnomusicology are designed to develop students' understanding of music within the prevailing social and cultural contexts; to establish a framework for critical evaluation of music and musical practices; to achieve a working familiarity with recognized, or at least representative, masterworks of musical literature; to develop students' ability to speak articulately about the styles and substance of music; and to equip students with analytic and literary skills and with a working knowledge of the bibliography of music.

Performance

Performance instruction in individual or group settings is available for university credit for an additional fee. Private instruction is offered in all orchestral instruments and in piano, organ, guitar, dulcimer, mandolin, saxophone, euphonium, fiddle, banjo, steel drum/pan, and voice. Credit is flexible, but beginning students may register for only 1 credit hour. Students contract with the private instructor regarding lesson length and practice hours and can earn either 1 or 2 credit hours each semester. Students in the School of Engineering can count up to 12 hours of performance courses towards liberal arts core requirements. For others, performance is elective credit. Group instruction is offered in piano, guitar, and percussion; groups have maximum of six students and earn 1 credit hour.

Group Performance Instruction: Non-Major

Group instruction is designed for beginning students with emphasis on basic technique, rhythm, tone, and musical interpretation. Groups are limited to six students.

Registration. New students must interview with the appropriate faculty member before finalizing registration. Instructions are given in the online registration system.

Fees. Music fees are in addition to tuition charges and are not refundable after the change period. The cost for group instruction is \$880.00 per semester for one 50-minute lesson weekly. (Fees, set annually by the Board of Trust, are subject to review and change without further notice.)

Individual Performance Instruction

Individual instruction is focused on the art and practice of an instrument or voice, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Blair offers collegiate-level performance instruction for non-majors at the 1100 level. 2100-, 2200-, 4100- and 4200-level courses are open only to B.Mus. and B.Mus.Arts students.

Registration. New students must interview with the appropriate faculty member before finalizing registration. Information is available in YES. Enrollments are limited.

Credit. University students enrolled in individual instruction may earn 1 or 2 credit hours depending on lesson length and practice commitment.

- 30-minute or 45-minute lessons with 5 hours minimum weekly practice earn 1 credit hour.
- 60-minute lessons with 10 hours minimum weekly practice earn 2 credit hours.
- Beginners may not register for more than 1 hour of credit.

Fees. Music fees are charged in addition to regular tuition, and are not refundable after the change period. Students receiving need-based financial aid may request that music fees be considered in their financial aid package. Students with a declared second major or minor in music will be charged approximately one-half the music performance instruction fee. For instrument courses numbered 1100, fees per semester are as follows:

	Elective Credit / Non-Blair Students	2nd majors and minors receive 50% discount
One 30-minute lesson weekly	\$1,140	
One 45-minute lesson weekly	\$1,597	
One 60-minute lesson weekly	\$2,002	

Fees, set annually by the Board of Trust, are subject to review and change without further notice.

Music Minors

Students may elect one of four minors: music, music composition, musicology/ethnomusicology, or music performance. Formal admission to the general minor, the performance minor, or the second major is contingent upon a performance audition that meets departmental standards for the intermediate or advanced level of study. Following interviews with the appropriate department, students plan their studies with Blair advisers. Contact information and declaration paperwork are available online: blair.vanderbilt.edu. Students must complete all requirements for the music minors with standard grading basis (that is, not Pass/Fail).

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Music Minor. 24 or 25 hours.

Music Theory. 6 or 7 hours.

MUTH 1200-1210; or MUTH 2100-MUSC 2100 and
MUTH 2200-MUSC 2200

Musicology/Ethnomusicology. 12 hours.

MUSL 2200W or 1200

One course chosen from: MUTH 3890, MUSL 1111-02
(Shakespeare and Music), 1210, 1220, 1230, 3220-3240,
and, with approval of department chair, 3890

One course chosen from: MUSL 1111-01 (Music and Global
Health), MUSL 1111-03 (Music and Modernism), MUSL
1111-04 (Music, Identity, and Diversity), 1100, 1105, 2110,
2150, 2610, 3150, 3155, 3220-3240, and 3890

One course chosen from: MUTH 3890 or any MUSL course

Performance. 4 hours.

Individual performance instruction in a single instrument
for at least 4 semesters (any orchestral instrument,
piano, organ, guitar, saxophone, euphonium, voice, or
JAZZ 1100).

Students must meet minimum performance standards for
admission to the program, earning a total of 4 hours.

Declaration forms are available in the Blair office and
online at blair.vanderbilt.edu/academics.

Ensemble. 2 hours (2 different semesters).

Participation for two semesters in an appropriate perform-
ing ensemble, after consultation with the minor adviser.

Musicology/Ethnomusicology Minor. 18 or 19 hours.

Music Theory. 6 or 7 hours.

MUTH 1200-1210; or MUTH 2100-MUSC 2100 and
MUTH 2200-MUSC 2200

Musicology/Ethnomusicology. 12 hours.

MUSL 2100, MUSL 2200W*, MUSL 3100, and one course
from 3220-3240.

*Students who have completed MUSL 1200 must substitute another course for
MUSL 2200W, selected from MUSL 1100, 1105, 1210, 1220, 1230, 1300, 1600,
1610, 1620, 1630, 1640, 1650, 1660, 2110, 2150, 2320, 2600, 2610, 3155, 3150,
3220-3240, 3160, or 3890.

Music Composition Minor. 26 hours.

Music Theory. 13 hours.

MUTH 2100, 2200, 2300, 2400; MUSC 2100, 2200

Musicology/Ethnomusicology. 6 hours.

MUSL 1200 or 2200W, 3100

Composition. 7 hours.

COMP 1100; COMP 2100 (4 semesters)

Formal admission into the music composition minor requires
departmental approval. Applicants should submit a
composition portfolio consisting of three completed works,
with scores and recordings (MIDI is acceptable) to the
Composition and Theory Department Chair.

Music Performance Minor. 25 or 26 hours.

Music Theory. 6 or 7 hours.

MUTH 1200-1210; or MUTH 2100-MUSC 2100 and
MUTH 2200-MUSC 2200

Musicology/Ethnomusicology. 6 hours.

MUSL 2200W or 1200

One course chosen from MUSL 3220-3240 (Jazz students:
MUSL 1620)

Performance. 8–11 hours.

Individual instruction in a single instrument for at least 6 semesters (any orchestral instrument, piano, organ, guitar, saxophone, euphonium, or voice.) Jazz students earn 8 hours in 4 semesters of JAZZ 1100.

Students must meet minimum performance standards for admission to the program, earning a total of 8–11 hours. Repertoire information and declaration forms are available in the Blair office and online at blair.vanderbilt.edu/academics.

Ensemble. 2 hours (two different semesters).

Participation for two semesters in an appropriate performing ensemble, as assigned following audition. String, woodwind, brass, percussion, and harp students must audition for MUSE 1010, Instrumental Ensemble. Students who are not placed in MUSE 1010 may participate in another appropriate ensemble, contingent upon permission of the ensemble instructor and the studio instructor. Guitar and voice students must audition for MUSE 1020, Symphonic Choir. Keyboard students must participate as a pianist for one semester in MUSE 2300, 2310, 2320, 2330, 2210, 2230, or 2270; or in 1010, 1020, 1030, or 2120, contingent upon permission of the ensemble instructor and the piano instructor. Jazz students may choose MUSE 1310, 1320, or 1330.

Elective for Jazz students. 2–3 hours. One or two courses chosen from MUSO 1220, 1221, 1222, 1340, 1342; MUTH 3120; JAZZ 1150; MUSL 1105, 1600, 1630, 2110, 2600, 2610, 2620, 3160.

Music as a Second Major

Blair offers a non-professional liberal arts major in music that requires a minimum of 31 hours. Designed jointly by Blair and the College of Arts and Science, it is also available to Peabody and Engineering students as a second major. Following interviews with the appropriate performance department, students plan their studies with Blair adviser Professor Michael Hime, coordinator of the program. Contact information and declaration paperwork are available online: blair.vanderbilt.edu. Students must complete all requirements for the music as a second major with standard grading basis (that is, not Pass/Fail).

Music Major (Second Major). 31 hours.

Music Theory. 12 hours.

MUTH 2100-MUSC 2100, MUTH 2200-MUSC 2200,
MUTH 2300-MUSC 2300, and MUSC 2400.

Musicology/Ethnomusicology. 9 hours.

MUSL 2100, 2200W*, 3100.

*Students who have completed MUSL 1200 must take an additional course instead of MUSL 2200W, selected from MUSL 3220-3240.

Individual Performance Instruction. 6 hours.

Six semesters of study in any orchestral instrument, piano, organ, guitar, saxophone, euphonium, or voice.

Students must meet minimum performance standards for admission to the program, earning a total of 6 hours. Repertoire information and declaration forms are available in the Blair office and online at blair.vanderbilt.edu/academics.

Ensemble. 2 hours (two different semesters).

Participation for two semesters in an appropriate performing ensemble, as assigned following audition. String, woodwind, brass, percussion, and harp students must audition for MUSE 1010, Instrumental Ensemble. Students who are not placed in MUSE 1010 may participate in another appropriate ensemble, contingent upon permission of the ensemble instructor and the studio instructor. Guitar and voice students must audition for MUSE 1020, Symphonic Choir. Keyboard students must participate as a pianist for one semester in MUSE 2300, 2310, 2320, 2330, 2210, 2230, or 2270; or in 1010, 1020, 1030, or 2120, contingent upon permission of the ensemble instructor and the piano instructor.

Elective. 2–3 hours.

One course in music theory, musicology/ethnomusicology, or conducting, chosen from MUTH 2400, 3130, 3110, 3210, 3200, 3120, 3140, 3160, 3890; any MUSL; MCON 3000.

The Degree Programs

Bachelor of Music

The Bachelor of Music degree program includes four different majors: performance, composition, integrated studies, and integrated studies/teacher education. The performance major is available in any orchestral instrument, piano, saxophone, euphonium, and voice. The composition major emphasizes both the creation and analysis of music. Performance and composition majors may complete an optional concentration in collaborative arts, composition, conducting, ethnomusicology, jazz, multiple woodwinds, music and the mind, musicology, pedagogy, or music theory. The integrated studies major provides a solid foundation in the art of music and includes a required concentration in collaborative arts, composition, conducting, ethnomusicology, jazz, multiple woodwinds, musicology, pedagogy, music theory, or an individually designed area.

The integrated studies/teacher education program, a five-year curriculum jointly developed with Peabody College, is for students interested in earning the master of education degree and teacher licensure in addition to the bachelor of music degree. Students in this curriculum can earn the B.Mus. degree in four years and the M.Ed. and teacher licensure for instrumental/general or vocal/general music in the fifth year (June–May).

All bachelor of music degree candidates complete a program designed to ensure an intense, yet broadly-based, understanding of the discipline of music, focused on the skills and knowledge students will need to succeed as informed musicians of the twenty-first century. Each student must complete 126 credit hours, including 80 hours in music. The music core (44 credit hours minimum) includes music theory, musicianship, keyboard harmony, music literature, conducting, technology for musicians, pedagogy, and ensemble. Each major has additional specific requirements, including performance instruction and other music courses (to fulfill 80 hours). Liberal arts core requirements (minimum of 30 hours) include English, the humanities, courses chosen from history or social science, mathematics or natural science, and academic electives. Students may take free electives to total 126 hours. Sample curriculum plans are in the *Blair Student Handbook* at blair.vanderbilt.edu/academics.

Bachelor of Music Degree Requirements

Requirements by Major Area

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

BRASS PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
MUTH 2100, 2200, 2300, 2400
MUSC 2100, 2200, 2300, 2400
MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
MCON 3000

TECHNOLOGY. 1 hour
MUSO 1340

ENSEMBLE. 10 hours minimum
MUSE 1010 (every semester in residence); MUSE 2210 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)
TRPT, HORN, TROM, EUPH, or TUBA 2200; 4200

RECITAL ATTENDANCE. No credit
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. TRPT, HORN, TROM, or TUBA 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MPED 3142, MREP 2110

LIBERAL ARTS. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

COMPOSITION

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
MUTH 2100, 2200, 2300, 2400
MUSC 2100, 2200, 2300, 2400
MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
MCON 3000

TECHNOLOGY. 1 hour
MUSO 1340

ENSEMBLE. 8 hours minimum (every semester in residence)
Eight semesters selected with the adviser's approval. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 6 hours, 6 semesters
3 semesters in any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, or voice (1100 level); 2 semesters chosen from any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, or voice or MUED 1010-1040; 1 semester chosen from any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, voice (1100 level), or JAZZ 1100.

RECITAL ATTENDANCE. No credit
MUSO 1000 (every semester in residence except penultimate or final semester)

COMPOSITION. COMP 2301-2304, 4301-4304
Students rotate instructors as assigned for COMP 2301-2304 to gain experience with 4 different members of the department. COMP 1100 may be substituted for Section 01 [Kurek] of COMP 2301 or Section 01 [Kurek] of COMP 2303. Students may select one or more instructors of choice for COMP 4301-4304.

OTHER MUSIC. COMP 1000 (every semester in residence); MUTH 3110, MUTH 3210 or 3220, COMP 3978, 4970

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. Must include one year of a foreign language, normally French, German, or Italian. Another language appropriate to the student's musical pursuits may be chosen with approval of composition/ theory department. Two (2) courses chosen from: 2000-level or higher art history, 2000-level or higher English, 2000-level or higher philosophy; a total of 33 hours, rather than 30, in liberal arts (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

HARP PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
MUTH 2100, 2200, 2300, 2400
MUSC 2100, 2200, 2300, 2400
MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
MCON 3000

TECHNOLOGY. 1 hour
MUSO 1340

ENSEMBLE. 10 hours minimum
MUSE 1010 (every semester in residence); MUSE 1130 or 2210 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)
HARP 2200; 4200

RECITAL ATTENDANCE. No credit
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. HARP 1000 (every semester in residence), MUSO 3970, 4970

OTHER MUSIC. MREP 2130, MPED 3128

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

INTEGRATED STUDIES

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
MUTH 2100, 2200, 2300, 2400
MUSC 2100, 2200, 2300, 2400
MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
MCON 3000

TECHNOLOGY. 1 hour
MUSO 1340

ENSEMBLE. 8-10 hours (every semester in residence)
Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

Strings, woodwinds, brass, harp, percussion—(10 hours minimum) Eight semesters MUSE 1010 (including four semesters of MUSE 1130, 1140, 2220, 2210, 2230, or 2240, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career.

Piano—(8 hours) MUSE 2300 (one semester), 2320 (one semester), 2310 (one semester), conducted ensemble 1020, 2120, 1010, 1030, or other approved conducted choir (one semester), and choice of 1010, 1020, 1030, 1140, 1310, 2120, 2320, 2330, 2210, 2310, or 2230 (four semesters). Participation in 1010 or 1030 is contingent upon approval of ensemble conductor and piano instructor.

Voice—(8 hours) Eight semesters MUSE 1020 or 2120 as assigned (or 2330 if demonstrated schedule conflict exists); juniors or seniors cast in principal roles in MUSE 1030 (as defined by the voice faculty) may substitute MUSE 1030 for one semester only of MUSE 1020 or 2120.

Composition—(8 hours) Eight semesters, selected with adviser's approval

INDIVIDUAL PERFORMANCE or COMPOSITION (for composition students) INSTRUCTION. 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit
MUSO 1000 (every semester in residence except penultimate or final semester)

REQUIRED CONCENTRATION IN MUSIC. 18-20 hours.

PERFORMANCE. Performance class (or composition studio class for composers) every semester in residence (BASS 1000, BSSN 1000, CLAR 1000, CLLO 1000, COMP 1000, FLUT 1000, HARP 1000, HORN 1000, OBOE 1000, PERC 1000, PIAN 1000, SAX 1000, TROM 1000, TRPT 1000, TUBA 1000, VLA 1000, VLN 1000, VOIC 1000)

OTHER MUSIC. 3 hours. MUSO 1400, 1410, 1420 (required for voice only); 4 hours of 1100-level performance instruction or MUED 1010-1040 and 3 hours MUTH 3110 (required for composition only); MUSO 1130 (required for percussion only)

PEDAGOGY. 2 hours. MPED in the area of individual performance or COMP 1000 for composition.

MUSIC ELECTIVES. To complete a minimum of 80 hours in music.

LIBERAL ARTS. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

INTEGRATED STUDIES/TEACHER EDUCATION, INSTRUMENTAL/GENERAL

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
MUTH 2100, 2200, 2300, 2400
MUSC 2100, 2200, 2300, 2400
MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
MCON 3000

TECHNOLOGY. 1 hour
MUSO 1340

ENSEMBLE. 9 hours minimum (every semester in residence) Instrumental ensemble and co-requisite chamber music are required both semesters of freshman year, and a total of six semesters of conducted ensemble (chosen from MUSE 1010, 1020, or 2120) and two semesters of small ensemble is required. Instrumentalists must enroll in at least one semester of MUSE 1020 or 2120 and have experience in orchestra, wind ensemble, jazz ensemble (as appropriate), choir and chamber music, with ensemble enrollment required every semester and every module in residence. Pianists must be accepted in MUSE 1010, 1020, or 2120 by the beginning of the second semester. During study abroad, a student could choose to waive an ensemble of choice. Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors.

INDIVIDUAL PERFORMANCE or COMPOSITION INSTRUCTION. 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit
MUSO 1000 (every semester in residence except penultimate or final semester)

COMPOSITION/THEORY. MUTH 3110

PERFORMANCE. Performance class (or composition studio class for composers) on primary instrument every semester. Secondary instrument(s) two semesters; Intro to Guitar GTR 1010. Senior Recital MUSO 4970. Composition majors only: Performance instruction in an instrument or voice, 8 semesters [8 hours]; composition majors must meet the performance department standards for instruction at the 2100 level and participation in required ensembles.

OTHER MUSIC. Instrumental Conducting MCON 3010.
Note: Conducting study must include two different professors.
MUSO 1130 (Percussion majors only)

PEDAGOGY. 2 hours. MPED in the area of individual performance or COMP 1000 for composition

TEACHING. Class Instruments MUED 1010, 1020, 1030, 1040; Methods and Materials MUED 2010, 3010; Experiential Instruction in Music MUED 3880, 3881, 3882; One MUED seminar of choice MUED 2120-2150; Practica in Music Teaching MUED 3870, 3871, 3872.

LIBERAL ARTS. 34 hours

English/Writing: 6 hours, including MUSL 2200W and choice of AP/IB English credit, any ENGL, or any writing course (any W in the English language, any 1111, or ENGL 1100; must be from outside of music).

Humanities: 9 hours, including MUSL 2100 and 6 hours in humanities (must be HCA in AXLE categories and two different fields). Must be in different fields from music, writing course, or English.

History and Social Science: 6 hours, including 3 hours American History and 3 hours in a social science discipline other than history (must be SBS in AXLE categories), or PSY-PC 2550 is recommended.

Mathematics and Natural Science: 7 hours, including 3 hours math, chosen from statistics (PSY-PC 2110) or calculus (MATH 1010, 1011, 1100, 1200, 1201, 1300, 1301); and 4 hours any science course with a lab.

Academic Electives: 6 hours, specifically EDUC 1220 and SPED 1210 (to be completed before fall of the junior year).

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

INTEGRATED STUDIES/TEACHER EDUCATION, VOCAL/GENERAL MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
MUTH 2100, 2200, 2300, 2400
MUSC 2100, 2200, 2300, 2400
MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
MCON 3000

TECHNOLOGY. 1 hour
MUSO 1340

ENSEMBLE. 8 hours minimum (every semester in residence) 6 semesters large ensemble (chosen from MUSE 1010, 1020, or 2120) and 2 semesters small ensemble. Juniors or seniors cast in principal roles in MUSE 1030 (as defined by the voice faculty) may substitute MUSE 1030 for one semester only of MUSE 1020 or 2120. Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE or COMPOSITION INSTRUCTION. 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit
MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. Performance class on primary instrument every semester. PIAN 1100 one semester (or VOIC 1100 for non-voice majors). African Performing Ensemble MUSE 1230 one semester. Intro to Guitar GTR 1010. Senior Recital MUSO 4970. Composition majors only: Performance instruction in an instrument or voice, 8 semesters [8 hours]; composition majors must meet the performance department standards for instruction at the 2100 level and participation in required ensembles.

OTHER MUSIC. MCON 3020 Choral Conducting. MUSO 1400 Diction for Singers: English and Italian; MUSO 1410 Diction for Singers: German; MUSO 1420 Diction for Singers: French; it is recommended that MUSO 1400, MUSO 1410 and MUSO 1420 be taken in sequence in the first three semesters). MUSO 1130 (percussion majors only).

PEDAGOGY. 2 hours. MPED in the area of individual performance or COMP 1000 for composition.

TEACHING. Methods and Materials MUED 2010, 3020; Choral Literature and Arranging MUED 2110; Experiential Instruction in Music MUED 3880, 3881, 3882; Piano Skills MUED 1080 (or VOIC 1100 for non-voice majors); One MUED seminar of choice MUED 2120-2150; Practica in Music Teaching MUED 3870, 3871, 3872.

LIBERAL ARTS. 34 hours

English/Writing: 6 hours, including MUSL 2200W and choice of AP/IB English credit, any ENGL, or any writing course (any W in the English language, any 1111, or ENGL 1100; must be from outside of music).

Humanities: 9 hours, including MUSL 2100 and 6 hours in humanities (must be HCA in AXLE categories and two different fields). Must be in different fields from music, writing course, or English.

History and Social Science: 6 hours, including 3 hours American History and 3 hours in a social science discipline other than history (must be SBS in AXLE categories), or PSY-PC 2550 is recommended.

Mathematics and Natural Science: 7 hours, including 3 hours math, chosen from statistics (PSY-PC 2110) or calculus (MATH 1010, 1011, 1100, 1200, 1201, 1300, 1301); and 4 hours any science course with a lab.

Academic Electives: 6 hours, specifically EDUC 1220 and SPED 1210 (to be completed before fall of the junior year).

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

PERCUSSION PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours

MUTH 2100, 2200, 2300, 2400

MUSC 2100, 2200, 2300, 2400

MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

TECHNOLOGY. 1 hour

MUSO 1340

ENSEMBLE. 10 hours minimum

MUSE 1010 (every semester in residence); MUSE 1140, 2220, or 2210 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters

(every semester in residence)

PERC 2200; 4200

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. PERC 1000 (every semester in residence), MUSO

3970, 4970

OTHER MUSIC. MUSO 1130, MREP 2120 or 2121, MPED 3144

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

PIANO PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours

MUTH 2100, 2200, 2300, 2400

MUSC 2100, 2200, 2300, 2400

MUKH 2133 and 2134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

TECHNOLOGY. 1 hour

MUSO 1340

ENSEMBLE. 8 hours minimum (every semester in residence)

MUSE 2300 (one semester), 2320 (one semester), 2310 (one semester), conducted ensemble 1020, 2120, 1010, 1030, or other approved conducted choir (one semester), and choice of 1010,

1020, 1030, 1140, 1310, 2120, 2320, 2330, 2210, 2310, or 2230 (four semesters). Participation in 1010 or 1030 is contingent upon approval of ensemble conductor and piano instructor. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters

(every semester in residence)

PIAN 2200; 4200

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. PIAN 1000 (every semester in residence), MUSO 3970,

4970

OTHER MUSIC. MREP 3310, 3311, MPED 3110

LIBERAL ARTS CORE. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

STRING PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours

MUTH 2100, 2200, 2300, 2400

MUSC 2100, 2200, 2300, 2400

MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours

MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours

MCON 3000

TECHNOLOGY. 1 hour

MUSO 1340

ENSEMBLE. 10 hours minimum

MUSE 1010 (every semester in residence); MUSE 2210, 2230, or 2240 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). All students except double bass majors must have experience in string quartet (MUSE 2240). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters

(every semester in residence)

VLN, VLA, CLLO, or BASS 2200, 4200

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. VLN, VLA, CLLO, or BASS 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MREP 2130. MPED 3120, 3121, 3125, or 3127

MUSIC ELECTIVES. To complete minimum of 80 hours in music

LIBERAL ARTS. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

VOICE PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
 MUTH 2100, 2200, 2300, 2400
 MUSC 2100, 2200, 2300, 2400
 MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
 MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
 MCON 3000

TECHNOLOGY. 1 hour
 MUSO 1340

ENSEMBLE. 8 hours minimum (every semester in residence)
 Eight semesters MUSE 1020 or 2120 as assigned (or 2330 if demonstrated schedule conflict exists); juniors or seniors cast in principal roles in MUSE 1030 (as defined by the voice faculty) may substitute MUSE 1030 for one semester only of MUSE 1020 or 2120. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 28 hours, 8 semesters (every semester in residence)
 VOIC 2200; 4200

RECITAL ATTENDANCE. No credit
 MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. PIAN 1100 (two semesters); VOIC 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MUSO 1400, 1410, 1420, MREP 3330, MPED 3130

LIBERAL ARTS. 30 hours, including 6-10 hours (two semesters) chosen from French, German, and Italian (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

WOODWIND PERFORMANCE

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
 MUTH 2100, 2200, 2300, 2400
 MUSC 2100, 2200, 2300, 2400
 MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
 MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
 MCON 3000

TECHNOLOGY. 1 hour
 MUSO 1340

ENSEMBLE. 10 hours minimum
 MUSE 1010 (every semester in residence); MUSE 2210 (four semesters, 1/2 credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career). Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

INDIVIDUAL PERFORMANCE INSTRUCTION. 32 hours, 8 semesters (every semester in residence)
 FLUT, OBOE, CLAR, BSSN, SAX 2200; 4200

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. FLUT, OBOE, CLAR, BSSN, SAX 1000 (every semester in residence); MUSO 3970, 4970

OTHER MUSIC. MREP 2140 (flute, oboe, clarinet, and bassoon) or MREP 2141 (saxophone); MPED 3140 (section appropriate for major instrument)

LIBERAL ARTS CORE. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

Bachelor of Musical Arts

The bachelor of musical arts degree gives excellent performers and composers the flexibility to combine in-depth music study with a second focus in a field outside of music. The degree, which is available in any orchestral instrument, piano, saxophone, euphonium, voice, and composition, includes 63 credit hours in music; a specific field outside of music or an individually-designed area of interdisciplinary studies (minimum of 19 hours) is also required. In addition to performance or composition instruction (16 hours), the music core (44 credit hours minimum) includes music theory, musicianship, keyboard harmony, music literature, conducting, technology for musicians, pedagogy, and ensemble. Liberal arts core requirements (minimum of 30 hours) include English, the humanities, courses chosen from history or social science, mathematics or natural science, and academic electives. Students may take free electives to total 126 hours.

Through a dual B.Mus.Arts/MBA program, interested students in the musical arts degree have an opportunity to compress both the bachelor of musical arts at the Blair School of Music and the master of business administration at the Owen Graduate School of Management into ten semesters in residence. Application for this program is made early in the fall semester of the junior year. First-year students will be admitted to the B.Mus.Arts through the admissions process of the Blair School. Students must declare the concentration within music or the field outside of music of the B.Mus.Arts no later than the tenth day of the first semester of the junior year. Sample curriculum plans are in the *Blair Student Handbook* at blair.vanderbilt.edu/academics.

Bachelor of Musical Arts Degree Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

MUSIC THEORY, MUSICIANSHIP, AND KEYBOARD HARMONY. 19 hours
 MUTH 2100, 2200, 2300, 2400
 MUSC 2100, 2200, 2300, 2400
 MUKH 1131, 1132, 1133, and 1134

MUSICOLOGY/ETHNOMUSICOLOGY. 12 hours
 MUSL 2100, 2200W, one course chosen from 3220-3240, 3100

CONDUCTING. 2 hours
 MCON 3000

TECHNOLOGY. 1 hour
 MUSO 1340

ENSEMBLE. 8-10 hours (every semester in residence)

Auditions for major ensembles are required each semester until requirements are fulfilled. Assignment to ensembles is at the discretion of the directors. During study abroad, students may waive participation in an ensemble of choice.

Strings, woodwinds, brass, harp, percussion—(10 hours minimum) Five semesters MUSE 1010 (including four semesters of MUSE 1130, 1140, 2220, 2210, or 2240, ½ credit minimum each semester, taken both semesters of freshman year, with two additional courses taken during career); and three semesters ensemble of choice.

Piano—(8 hours) One semester chosen from MUSE 1020, 2120, 1010, 1030, or other approved conducted choir; one semester of 2300; three semesters of 2320, 2330, 2210, 2310, or 2230; three semesters ensemble of choice with adviser's approval.

Voice—(8 hours) Eight semesters MUSE 1020 or 2120 as assigned (or 2330 if demonstrated schedule conflict exists); juniors or seniors cast in principal roles in MUSE 1030 (as defined by the voice faculty) may substitute MUSE 1030 for one semester only of MUSE 1020 or 2120.

Composition—(8 hours) Eight semesters, selected with adviser's approval

INDIVIDUAL PERFORMANCE or COMPOSITION (for composition students) **INSTRUCTION.** 16 hours, 8 semesters (every semester in residence)

RECITAL ATTENDANCE. No credit

MUSO 1000 (every semester in residence except penultimate or final semester)

PERFORMANCE. Performance class (or composition studio class for composers) every semester in residence (BASS 1000, BSSN 1000, CLAR 1000, CLO 1000, COMP 1000, FLUT 1000, HARP 1000, HORN 1000, OBOE 1000, PERC 1000, PIAN 1000, SAX 1000, TROM 1000, TRPT 1000, TUBA 1000, VLA 1000, VLN 1000, VOIC 1000)

PEDAGOGY. 2 hours. MPED in the area of individual performance or COMP 1000 for composition.

OTHER MUSIC. 3 hours. MUSO 1400, 1410, 1420 (required for voice only); 4 hours of 1100-level performance instruction or MUED 1010-1040 and 3 hours MUTH 3110 (required for composition only); MUSO 1130 (required for percussion only)

MUSIC ELECTIVES. To complete a minimum of 63 hours in music.

DISCRETE AREA OF COMPETENCE. Minimum of 19 hours in a specific field outside of music, such as a minor or major in another school, a pre-professional course of study, or a self-designed interdisciplinary area. Self-designed interdisciplinary areas and new concentrations with a significant number of courses from another Vanderbilt school/college may be developed in consultation with the appropriate department. Must be declared no later than the 10th day of the first semester of the junior year.

LIBERAL ARTS. 30 hours (see full requirements below)

IMMERSION VANDERBILT.

FREE ELECTIVES. To complete 126 hours

Liberal Arts Core

The liberal arts core affords music students the opportunity to develop a broad-based understanding of intellectual endeavors and methods in a variety of disciplines, to explore

the interconnectedness of music, arts, and other humanistic pursuits, and to articulate their thinking in clear and effective language. The curriculum, which provides maximum flexibility for each student, requires a minimum of 30 hours (33 hours for composition majors and 34 for integrated studies/teacher education), satisfied through required categories as noted below. Students electing a second major outside of music complete only the Blair liberal arts core; they are not expected to fulfill the core requirements (such as AXLE) of another Vanderbilt school or college. Hours earned toward the Blair liberal arts core may also be counted toward a second major or minor, if appropriate. Students admitted with a deficiency relative to high school credits must plan their liberal arts work to overcome the deficiency. 1001 courses do not count for liberal arts core credit.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

English/writing (6 hours)

Students must complete writing course MUSL 2200W during the first year. A second English/writing course* of at least three credit hours, chosen from:

- Advanced Placement or International Baccalaureate credits in English/ Writing (consult the chapter on Admission for current policy)
- First year writing seminars (1111) in any discipline
- Writing courses in the English language in any discipline, designated by W in the course number.
- English: all courses
- Communication Studies: 1500, 1850
- MUSL 2330

For integrated studies/teacher education majors, an English/writing course outside of music is required.

*Students with a score of 770 on the Evidence-Based Reading and Writing portions of the SAT with a minimum score of 39 in the Writing and Language portion, or with a score of 35 on the Reading portion and 12 on the Writing portion of the ACT, may exempt the second English/writing course, substituting 3 hours of any academic elective. Students who do not present a score of 660 on the Evidence-Based Reading and Writing section of the SAT test (with a score of 27 in Reading and 28 in Writing and Language), or a score of 30 on the English portion of the ACT test, must enroll in English 1100 in the first semester.

Humanities (9 hours)

HUMANITIES REQUIREMENTS

MUSL 2100. Students should complete this required course during the first year.

Six additional hours of humanities electives (listed below)

For composition majors (B.Mus.), 15 hours minimum, including MUSL 2100: one year of French, German, or Italian; and 6 hours chosen from 2000-level or higher art history, 2000-level or higher English, and 2000-level or higher philosophy.

For integrated studies/teacher education majors (B.Mus.), 9 hours: MUSL 2100 and 6 hours in humanities (must be HCA in AXLE and in two different fields; must be in different fields from music, writing course, or English).

For voice performance majors (B.Mus.), 9-13 hours: MUSL 2100 and 6-10 hours (two semesters) chosen from French, German, and Italian.

HUMANITIES ELECTIVES

African American and Diaspora Studies: 1506 and all HCA-designated courses

Anthropology: All HCA-designated courses

Arabic: All courses

Aramaic and Classical Syriac: All courses

Asian Studies: 1201, 2100W, 2511, 2512, 2513W, 2607, 2608, 3151

Catalan: All courses
 Chinese: All courses
 Cinema and Media Arts: All courses except W courses
 Classics: All, except SBS-designated courses
 English: All courses
 European Studies: All HCA-designated courses
 French: All courses
 German: All courses
 Greek: All courses
 Hebrew: All courses
 Hindi-Urdu: All courses
 History of Art: All courses (art studio courses excluded)
 Humanities: All courses
 Italian: All courses
 Japanese: All courses
 Jewish Studies: All HCA- and US-designated courses
 Korean: All courses
 Latin: All courses
 Medicine, Health, and Society: All HCA-designated courses
 Music Literature/History: 1111-02, 1111-03, (Music and Modernism; Shakespeare and Music), 1300, 1610, 3155
 Philosophy: All courses except 1003 and 3003
 Portuguese: All courses
 Religious Studies or Divinity School: All courses
 Russian: All courses
 Spanish: All courses
 Theatre: All courses offered for AXLE credit
 Ugaritic: All courses
 Women's and Gender Studies: All HCA- and US-designated courses, 2239, 2248

History, Social Science (3 hours)

For integrated studies/teacher education majors, 6 hours History and Social Science are required: 3 hours American History chosen from HIST 1390, 1400, 1410, 1420, 1440, 1660, 1690, 1730, 1740, 2580, 2590, 2610, 2620, 2630, 2640, 2650, 2690, 2700, 2710 and AP credit in American History; and 3 hours in a social science discipline other than history (must be SBS in AXLE categories, or PSY-PC 2550 is recommended).

HISTORY

Classics: Only SBS-designated courses
 History: All courses
 Music Literature/History: 1110, 1111-01 (Music and Global Health), 2110, 2150, 2600

SOCIAL SCIENCE

African American and Diaspora Studies: All courses except 1506 and HCA-designated
 American Studies: 2100, 3890
 Anthropology: All courses except HCA-designated
 Asian Studies: 2630, 1680, 2560
 Communication Studies: All AXLE courses except 1500 and 1850
 Economics: All courses offered for AXLE credit
 European Studies: All courses except HCA-designated
 Human and Organizational Development (Peabody): All 3-hour courses except 1115 and practica
 Interdisciplinary Studies: 3001
 Jewish Studies: All SBS-, INT-, and P-designated courses
 Latin American Studies: All AXLE courses
 Medicine, Health, and Society: All P-designated courses and 2510, 3120, 3350
 Political Science: All courses
 Psychology (A&S): All courses except MNS-designated
 Psychology and Human Development (Peabody): All 3-hour courses from 1205-3200 inclusive
 Public Policy Studies: All courses
 Sociology: All courses
 Women's and Gender Studies: All courses except HCA- and US-designated and 2239, 2248

Mathematics, Natural Science (3 hours)

Students who score below 550 on the SAT Math Section or below 22 on ACT Math should take MATH 1010 or 1005. For integrated studies/teacher education majors, 7 hours, including statistics (PSY-PC 2110 [Peabody]) or calculus (MATH 1010, 1011, 1100, 1200, 1201, 1300, 1301); and a science course with a lab.

MATHEMATICS

Mathematics: All courses
 Philosophy: 1003 and 3003
 Psychology (Peabody): PSY-PC 2110

NATURAL SCIENCE

Astronomy: All MNS-designated courses, including accompanying labs
 Biological Sciences: All AXLE courses, with corequisite labs
 Chemistry: All AXLE courses, with corequisite labs
 Earth and Environmental Sciences (Geology): All MNS-designated courses
 Neuroscience: All MNS-designated courses
 Physics: All MNS-designated courses, including accompanying labs
 Psychology: All MNS-designated courses

Academic Electives (9 hours)

For composition majors (B.Mus.), 2-6 hours, to complete 33 hours in liberal arts.

For integrated studies/teacher education majors, 6 hours, specifically Education 1220 and Special Education 1210.

For voice performance majors (B.Mus.), 5-9 hours to total 30 hours in liberal arts.

Academic electives, drawn from courses earning 3 or more credits, may include:

- Any course listed in the Liberal Arts Core
- Non-music courses in American studies, business, computer science, engineering science, financial economics, managerial studies, human and organizational development
- Any course in the Divinity School

Practicums and internships may not count as academic electives.

Free electives (sufficient to complete 126 hours)

Any course in any Vanderbilt school.

Minor Area and Concentration Requirements

Concentrations and the minor in a second instrument are open to bachelor of music and bachelor of musical arts degree students. Honors in Musicology and Ethnomusicology is open to all undergraduates. Deadline to declare a concentration or minor is the fifth day of the first semester of the senior year. For the integrated studies major, the deadline to declare a required concentration is the midpoint (on the last day students may withdraw from classes) of the fifth semester in residence.

CONCENTRATION IN COLLABORATIVE ARTS. 24 hours

Musicology/Ethnomusicology: MUSL 3220 or 3221
 Performance: HRPS 1100 (1 hour), MUSO 4970 (1 hour)
 Other Music: MUSO 1400, 1410, 1420; MREP 3310 or 3311, 3330; MUSO 3850 (2 hours in vocal coaching or chamber music literature)
 Ensemble: One semester chosen from MUSE 1010, 1020, or 2120; one semester of MUSE 2300; one semester of MUSE 1030 (as apprentice pianist); one semester each of MUSE 2210, 2230, 2310, 2320, and 2330; and four additional semesters of MUSE 2210, 2230, 2310, 2320, 2330, or other with adviser's approval
 Liberal Arts: Must include one semester each in two different languages chosen from Italian, German, or French. Students with previous study in one of these must study the other two.

CONCENTRATION IN COMPOSITION. 20 hours minimum

Prerequisite: COMP 1100; submission of portfolio of three representative works, with recordings; department approval.

Composition: Choice of four from 3110, 3120, 3130, 3140, 3170, 3200, 3210, 3220, MPED in composition

Composition: 4-6 hours over a minimum of 4 semesters in COMP 2100; Choice of two (6-7 hours) from ARTS, CMA, ENGL 1250W, ENGL 1290, HART 1105 or higher, THTR

CONCENTRATION IN CONDUCTING. 32 hours minimum (20 hours in music)

Department approval required before MCON 3030, 3050 and 3051. Criteria to include evidence of prior experience in conducting. Students interested in conducting should declare the individually-designed concentration in the fifth semester, pending faculty approval to declare the conducting concentration before the seventh semester.

Composition/Theory: MUSC 3105, 3106, 3107, 3108; MUTH 3110

Conducting: MCON 3000 (required in music core); MCON 3010 or 3020; MCON 3030; MCON 3040, 3041, 3042, 3043; MCON 3050, 3051

Other Music: MWEL 1140 or 2120

Liberal Arts: Four semesters of one language, selected from French, Italian, German, or Russian

CONCENTRATION IN ETHNOMUSICOLOGY. 21 hours minimum

Department approval required

Musicology/Ethnomusicology: Choice of MUSL 2000-level or above, 9-12 hours

Composition/Theory: Choice of MUTH 3140, MUTH 3200, or 3210, 3-6 hours

Cognate Area or Foreign Language:

Cognate area in AADS, AMER, ANTH, CMA, EUS, HIST, LAS, PHIL, SOC, WGS, or other area with department approval, 6-9 hours; or Foreign Language, 6-16 hours, 4 semesters:

Introductory-level competence, or one-year equivalent. May be satisfied through placement exam, AP/IB credit, or for-credit course work. Students who test out of introductory-level competence need only 2 semesters (minimum 6 hours) of 2000-level or above, 6-8 hours, 2 semesters.

2000-level or above language and/or culture courses, 6-8 hours, 2 semesters.

CONCENTRATION IN JAZZ. 20 hours minimum

Department approval required for admission into the concentration.

B.Mus. and B.Mus.Arts students are eligible to audition for a faculty committee no earlier than the end of their first year.

Literature/History: MUSL 1620

Composition/Theory: MUTH 3120; JAZZ 1150

Other Course Work: MUSO 1220, 1221, or 1222 (2 semesters, 2 hours); MUED 2140

Performance: JAZZ 1100 (minimum of 4 semesters/4 credit hours);

MUSO 4972 (in addition to recital required for major) or MUSO 3850 Senior Project (1 hour)

Ensemble: MUSE 1310, 1320, or 1330 (minimum of 4 semesters/4 credit hours)

CONCENTRATION IN MULTIPLE WOODWINDS. 23 hours

Department audition, consisting of performances on both secondary instruments, required before the end of the second semester in residence. Not available to performance majors. Three-, four-, and five-instrument options are possible.

Composition/Theory: MUTH 3110

Performance: 1100-level study in at least two secondary instruments, 4 semesters and 8 credit hours for each instrument; MUSO 4970, with repertoire for both primary and secondary instruments; corequisite performance classes required when enrolled in applied study; each secondary instrument must be performed in a large ensemble for at least one semester (instead of primary instrument)

Other Music: MPED 3140 in primary instrument, recommended in secondary instrument(s); MREP 2140 in primary instrument

CONCENTRATION IN MUSIC AND THE MIND. 23 hours

This concentration satisfies the area of discrete competence for the bachelor of musical arts. By using free and academic electives, this concentration could be completed in addition to a minor in neuroscience or psychology.

It is also available to B.Mus. students, but it will not satisfy the music hours requirement for integrated studies.

Liberal Arts: NSC 2201, PSY 1200, PSY 3750, PSY 3120, NSC 3269, PSY 3890, PSY-PC 3650 (PSY-PC 2110 recommended, NSC 3274 optional)

Musicianship: MUSC 3105, MUSC 3106

CONCENTRATION IN MUSICOLOGY. 21 hours minimum

Department approval required

Musicology/Ethnomusicology: Choice of MUSL 2000-level or above, 9-12 hours

Composition/Theory: Choice of MUTH 3140, MUTH 3200, or 3210, 3-6 hours

Cognate Area or Foreign Language:

Cognate area in AADS, AMER, ANTH, CMA, EUS, HIST, LAS, PHIL, SOC, WGS, or other area with department approval, 6-9 hours; or Foreign Language, 6-16 hours, 4 semesters:

Introductory-level competence, or one-year equivalent. May be satisfied through placement exam, AP/IB credit, or for-credit course work. Students who test out of introductory-level competence need only 2 semesters (minimum 6 hours) of 2000-level or above, 6-8 hours, 2 semesters.

2000-level or above language and/or culture courses, 6-8 hours, 2 semesters.

CONCENTRATION IN PEDAGOGY. 19 or 20 hours

Music Cognition course work: MUSO 3100 or MUSO 3850 (independent study in teaching Musicianship, 2 hours)

Instrumental Literature: Choice of MREP 3310, 3311, 3330, or MUSO 3850 (in field, 2 hours)

Pedagogy course work: Choice of MPED 3110, 3120, 3121, 3125, 3130, 3140 or MUSO 3850 (in field, 2 hours), and Pedagogy Practicum MPED 3870 (2 hours)

Pedagogy Internship: MPED 3880 (2 semesters, 6 hours)

Senior Recital: MUSO 4970

Liberal Arts: Must include PSY-PC 1250 and 2600 (Peabody courses)

CONCENTRATION IN MUSIC THEORY. 20 hours

Departmental approval required for admission to this concentration.

Composition/Theory: MUTH 3200 and 3210 and minimum of 15 hours in COMP 1100, MUTH 3110, 3120, 3130, 3140, 3150, 3160, 3170, 3220, MPED in theory, 3890

HONORS IN MUSICOLOGY AND ETHNOMUSICOLOGY. 9 hours

Departmental approval required for admission to this program; see regulations in the Honors section of the catalog.

Thesis: Departmental approval of a formal thesis prospectus, MUSL 4998-4999 (6 hours), and successful completion of an oral defense.

Course work: One course beyond the MUSL core chosen from MUSL 3150, 3220-3240, 3160, 2610, or 3890 (3 hours)

The MUSL credit hours of this program may double-count in the concentration in musicology or ethnomusicology.

MINOR INSTRUMENT. 10 hours

Ensemble: Participation on minor instrument (including voice) in two separate ensembles in addition to major instrument requirement, as assigned (2 hours)

Performance: Minimum of four semesters (8 hours) in a second performance area (any orchestral instrument, piano, organ, harpsichord, guitar, saxophone, euphonium, voice, or baroque instrument). Students must meet minimum performance standards, earning a total of 8 hours. Consent of instructor and department chair required. NOTE: Composition majors may satisfy the primary major ensemble and performance instruction requirements with courses also used to fulfill the minor instrument requirements.

Teacher Education

The Blair School and Peabody College offer a program for students interested in teacher licensure. Students completing

this program earn the bachelor of music (B.Mus.) majoring in the integrated studies/teacher education track for four years, and the master of education (M.Ed.) in the fifth year to complete professional education requirements. During the junior year, application is made to Peabody College. The M.Ed. work requires one calendar year, June–May. Students may elect to work toward licensure in either instrumental/general or vocal/general music, based on their interest and ability to perform at a level sufficient for placement in the appropriate performing ensemble. The curriculum includes a strong music performance emphasis; a solid foundation in musicology/ethnomusicology, theory, and the liberal arts; undergraduate and graduate courses in psychology and education; and practica (practical experience) four of the five years of study, with at least 15 weeks of student teaching in field placements. Practica constitute a wide variety of grade K-12 experiences, including public school, private school, and Blair's precollege programs such as Suzuki strings, Blair Children's Chorus program, and the Nashville Youth Orchestra program. Students complete the same music core requirements as any other B.Mus. candidate. The liberal arts core is adapted to fulfill state licensure requirements.

Junior Mid-Program Review [Screening I]

All students admitted to this program at matriculation must be formally continued through a process called Junior Mid-Program Review. Criteria for this review are listed below. Students not approved can complete the general integrated studies major.

Faculty evaluation of a student's qualifications for continuation in a teacher education program includes academic, performance, and disposition factors such as the following:

1. Dependability (as evidenced by good attendance and academic performance in classes and practica)
2. Professional and ethical behavior (honesty, acceptance of responsibility, emotional maturity, etc.)
3. Attitude and interpersonal skills (including the ability to work with children and with peers)
4. Academic competence

Fifth Year Curriculum

SUMMER		Semester hours
EDUC 6510	Principles of ELL Education	3
EDUC 6010	Psychological Foundations of Education (or an approved elective course)	3
EDUC 6310	Teaching in Secondary Schools	3
MUED 5000	Philosophical Foundations and Contemporary Issues in Music Education	3
FALL		
EDUC 6300	Social/Philosophical Aspects of Education	3
EDUC 6320	Practicum in Music Education	1
EDUC 7960	Independent Study in Music (may be taken in summer; requires approval of Blair associate dean)	2
or MUED 5100	Advanced Studies for the Wind Band Conductor	
MUED 5010/5020	Methods and Materials in Teaching Music, Instrumental or Vocal/Choral	3
MUED 5030	Methods and Materials in General Music, PreK through 12	3
SPRING		
EDUC 7974	Internship in Teaching: Music	6
EDUC 7975	Internship Seminar: Music (A capstone project is also required)	1

Total hours: 31

Specific Criteria

1. A minimum cumulative grade point average of 2.500.
2. Successful completion (C- or better) of EDUC 1220 and SPED 1210
3. Successful completion (C- or better) of MUTH 2200, MUSC 2200, MUSL 2200W and MUED 3870.
4. Successful completion (C- or better) of two additional Vanderbilt courses which count towards the Liberal Arts Core.
5. Departmental interview

General Criteria

These criteria rest on the professional judgment of appropriate faculty members, who are polled following the student's application for Junior Mid-Program Review.

1. Endorsement by the appropriate faculty that the applicant has demonstrated the academic and musical qualifications expected of Vanderbilt teacher education candidates.
2. Endorsement by the appropriate faculty that the applicant has demonstrated the personal and character traits expected of Vanderbilt teacher education candidates.

Procedure for Junior Mid-Program Review [Screening I]

Students apply for continuation in the teacher education program [Screening I] through the Blair program director.

Applications must be submitted in the fall semester of the junior year. Deadline for submitting applications for Junior Mid-Program Review [Screening I] is 1 October. A departmental interview is then held with each candidate to review the student's academic progress and disposition criteria of dependability, professional and ethical behavior, attitude, and interpersonal skills.

Admission to Student Teaching [Screening II]

Prospective student teachers must apply for admission to student teaching during the fall semester of the fifth year. Application materials are available online at peabody.vanderbilt.edu/admin-offices/teacher-licensure/licensure_for_undergraduate_students/screening.php. Deadline for submitting applications is 1 October. Student teaching includes at least 15 weeks of teaching in field placements.

General Criteria for Admission to Student Teaching

1. Completion of the B.Mus. degree.
2. Admission to the Master of Education program.
3. Successful completion of all courses prerequisite to student teaching.
4. A minimum grade point average of 3.00.
5. Satisfactory performance in course work in areas in which teacher licensure is sought.
6. Submission of a résumé and a letter to parents introducing yourself and outlining your goals for the students you teach.
7. Endorsement by the appropriate faculty regarding academic, musical, and personal readiness to teach, including dependability, professional and ethical behavior, attitude, and interpersonal skills.

Application for Teacher Licensure and University Recommendation for Licensure

All students completing the teacher education program at Vanderbilt are strongly advised to apply for a license in Tennessee whether or not they plan to teach in this state. Normally a Tennessee license is accepted in all other states and foreign countries in which Vanderbilt students apply to teach. The student is responsible for applying for licensure through the Office of Teacher Licensure located in 210 Peabody Administration Building. Each state has its own set of application forms and procedures for licensure; information is available in the Office of Teacher Licensure.

To be licensed through Vanderbilt's teacher education program, a graduate must earn a positive licensure recommendation from the university. The university's decision to recommend a candidate is based upon the following:

1. Maintaining a 3.0 grade point average in the fifth year.
2. Achieving the state minimum score on all required parts of the PRAXIS Examinations. A copy of the scores must be sent to the Vanderbilt Office of Teacher Licensure (code R 1871).
3. Satisfactory completion of the Teacher Performance Assessment (edTPA).
4. Receiving a positive recommendation from the student's department as a result of the student teaching experience (Pass in student teaching does not guarantee a favorable recommendation).

All Vanderbilt teacher education programs are approved by the Council for the Accreditation of Educator Preparation (CAEP). The program for licensure to teach instrumental/general or vocal/general music is approved by the National Association of Schools of Music (NASM).

3+2 B.Mus.Arts/MBA Blair-to-Owen Program

The five-year joint program between the Blair School of Music and the Owen Graduate School of Management allows a small cohort of particularly motivated students to overlap their undergraduate course work with work toward the MBA, facilitating the earning of both the undergraduate and graduate degrees in five years (ten semesters). By combining three and one-half years in Vanderbilt's Blair School of Music with one and one-half years of study in the Owen School, students may obtain both the bachelor of musical arts and the master of business administration in five years. The baccalaureate from the Blair School is awarded at the end of the fourth year, and the MBA from the Owen School after the fifth year. Students interested in pursuing this program must be enrolled in the musical arts degree.

Required course work includes the normal Blair course work for the musical arts degree, for a minimum of 63 credit hours in music. The liberal arts core will also follow the requirements for the major, but must include the following specific requirements:

- Calculus (1 semester)
- Statistics, e.g., ECON 1500: Economic Statistics
- ECON 1010: Principles of Macroeconomics
- ECON 1020: Principles of Microeconomics
- ECON 3010: Intermediate Microeconomic Theory

A curriculum plan, including recommended electives, is provided in the *Blair Student Handbook*.

Students must apply to the Owen School for admission to the five-year program during their junior year. Applications are due no later than October 1 of the junior year, and early application and GMAT are recommended. Acceptance into the five-year program is extremely competitive and requires advanced standing earned in undergraduate courses. Being deficient in full-time work experience, the 3+2 student must enhance his or her portfolio with an internship and outstanding academic performance, and also show a strong commitment to a rigorous business education. The Summer Business Institute (Accelerator) is strongly recommended for 3+2 applicants prior to matriculating at Owen. The successful applicant will bring an accomplished academic record (normally a GPA of 3.3 or better), satisfactory internship or work experience, an ability to articulate his or her own preparedness for the work environment, and a strong endorsement from Vanderbilt faculty.

Students who are accepted to the 3+2 program will remain registered as B.Mus.Arts students through fall of senior year, and will register as Owen students in spring of senior year. Academically, students will take a full load of business courses both in fall and spring of senior year while completing the final B.Mus.Arts degree requirements (normally, lessons and ensembles). The completion of the B.Mus.Arts degree requirements prior to fall of the student's fifth year is required for continuation in the MBA program.

Tuition and Financial Aid

The scholarship or other financial aid commitment of the Blair School will not be continued automatically beyond the seventh semester for students enrolled in the joint program. Eighth-semester financial aid is the student's responsibility. Students should notify the Owen School with their

application if they are interested in being a candidate for an Owen scholarship during their MBA studies. Early application is recommended. *Need-based aid will still apply.*

Students pay tuition to the undergraduate school for the fall semester of their fourth year, after which all tuition is paid to Owen (and reflects graduate school tuition rates). The Blair School of Music will waive fees for the required performance instruction during spring of the fourth year to facilitate completion of the B.Mus.Arts requirements.

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Special Programs

BLAIR School of Music offers individual, group, class, and ensemble instruction to precollege and adult students (defined as students above high school age not receiving university credit). A catalog describing these programs is available at blair.vanderbilt.edu. The precollege and adult program is called Blair Academy at Vanderbilt.

The Adult Program

Blair offers to adults individual instruction in orchestral instruments, piano, organ, guitar, harp, saxophone, euphonium, fiddle, banjo, mandolin, dulcimer, steel drum/pan, voice, and composition. Jazz voice, guitar, drumset, saxophone, and piano are also available. Group instruction is available in guitar and steel drum.

Classes are offered in music theory, musicology/ethnomusicology, music business, tai chi, songwriting, music technology, and Alexander Technique. Ensembles open to adults include the Vanderbilt Community Chorus, steel drum ensemble, African Performing Ensemble (Sankofa), and chamber music.

The Precollege Program

Blair offers individual instruction in orchestral instruments and in piano, organ, guitar, harp, saxophone, euphonium, fiddle, banjo, mandolin, dulcimer, steel drum/pan, and voice. Jazz voice, guitar, drumset, saxophone, and piano are also available. Group instruction is available in piano, fiddle, and (for young children) Kindermusik for ages birth to five years. Instruction using the Suzuki method is offered in violin and cello.

Class instruction includes music theory, musicology/ethnomusicology, musicianship, music technology, and Alexander Technique.

Ensemble training is offered through the Nashville Youth Orchestra program, the Blair Children's Chorus program, Violin Performing Ensemble, fiddle ensemble (Fiddle Frenzy), Children's Cello Choir, and chamber music.

The Blair School Certificate Program provides a curriculum integrating advanced levels of performance study with training in music theory and history, chamber music performance classes, and recitals. Students who successfully complete the requirements for this program present a solo recital during their high school senior year and receive either the Certificate of Distinction or the Certificate of Merit upon graduation. Honors may be earned with additional study in music theory and history. A variety of merit and need-based scholarships, for which students may audition, are awarded each year to outstanding precollege students by the school and by several donors. Students in area high schools may earn out-of-school credit towards high school graduation for individual study of music at Blair or through participation in the Nashville Youth Orchestra program or Blair Children's Chorus program.

The Blair Concert Series

The Blair Concert Series offers a broad array of music performances to the university community and the region. National and international artists and ensembles, the Blair faculty, including resident ensembles and soloists, and student ensembles and performers are all featured. All student recitals are open to the public. More than 350 concerts are presented

at the school each year, and most are free of charge, as a gift to the community.

A milestone in the Blair School's history was "The Blair Commissions: Music for the 21st Century," a project funded by the James Stephen Turner Family Charitable Foundation, which has commissioned several important works by renowned composers from 2005 through 2019. These include works by Susan Botti and Peter Schickele and four major works by Michael Hersch. Each composition received its premiere in Nashville, and all the works were then either recorded or performed in New York. The project has served two intertwined missions: to promote the composition of outstanding works by the world's leading composers and to invite attention to the excellent ensembles and faculty performers of Vanderbilt University.

Composers-in-residence who have visited the Blair School include Robert Beaser, William Bolcom, Susan Botti, George Crumb, Michael Daugherty, Lukas Foss, Gabriela Lena Frank, John Harbison, Michael Hersch, Karel Husa, Steven Mackey, Donald Martino, Cindy McTee, Kevin Puts, Christopher Rouse, Adam Schoenberg, Joseph Schwantner, Frank Ticheli, Michael Torke, and Joan Tower.

Academic Regulations

Honor System

All academic work at Vanderbilt is done under the Honor System (see the chapter on Life at Vanderbilt.)

Faculty Advisers

All entering students are assigned academic advisers who assist in the planning of programs and course schedules. Students are required to meet with their advisers prior to registration for each semester.

Class Attendance

Students are expected to attend all sessions of each class in which they are enrolled. Attendance is usually a factor in determining the final grade in a course. A student who fails to abide by the attendance policy set by the course instructor is subject to removal from the course.

The last day before and the first day after official holidays are considered to be the same as any other day on which classes are scheduled. Assignments are made for classes scheduled on these days, and tests may be given in them. Students should take this fact into account in making travel plans.

Classroom Recording Policy

The use of technologies for audio and video recording of lectures and other classroom activities is allowed only with the express permission of the instructor. In cases where recordings are allowed, such content is restricted to personal use only, unless permission is expressly granted in writing by the instructor and by other classroom participants, including other students. Personal use is defined as use by an individual student for the purpose of studying or completing course assignments. When students have permission for personal use of recordings, they must still obtain written permission from the instructor to share recordings with others.

For students registered with Student Access Services and who have been approved for audio and/or video recording of lectures and other classroom activities as a reasonable accommodation, applicable federal law requires instructors to permit those recordings. Such recordings are also limited to personal use, except with permission of the instructor and other students in the class.

Credit Hour Definition

Credit hours are semester hours; e.g., a three-hour course carries credit of three semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements which exceed this definition. Certain courses (e.g., dissertation research, ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester will be included in the course description.

Course Load

Tuition is charged on the basis of a normal course load of 12 to 18 semester hours. Course loads outside the norm, which must be recommended by the student's adviser and approved by the associate dean, are charged at an hourly tuition rate. Students permitted to take fewer than 12 hours are placed on probation, unless their light load is necessary because of outside employment or illness. The maximum course load for the summer session is 12 hours (6 hours for a summer half-session). A student must be enrolled in a minimum of 12 hours to be classified as a full-time student.

Advanced Placement

Advanced Placement with Credit. Advanced placement with credit is granted in a number of areas (see the chapter on Admission).

Advanced Placement without Credit. Students may be admitted to advanced music courses on the basis of placement tests at Blair, but no credit is awarded for music courses exempted.

Transfer Credit

Transfer courses are often taken as free electives, but they may also earn liberal arts core credit. They may not fulfill the music core requirements, count as part of the last 30 hours of residence, serve as repeat credit, or be taken on a Pass/Fail basis. Work transferred from another institution will not carry with it a grade point average. No course in which a grade below C- was received will be credited toward the B.Mus. or B.Mus.Arts. Information on the evaluation process and policies is available at registrar.vanderbilt.edu/transfer-credit.

Pre-freshman work. Credit for pre-freshman college work may be given, subject to evaluation through the Transfer Credit Submission application in YES. A detailed course syllabus is required in order for a course to be evaluated. Credit for courses taken at another institution during the summer preceding a student's initial enrollment at Vanderbilt will be granted only if approval is obtained in advance from the associate dean. The course work must be comparable to courses offered at Vanderbilt. Credit will be awarded only if the course is regularly offered by a regionally accredited two-year or four-year college or university, if the teacher was a regular faculty member of that institution, and if a majority of the students in the course were candidates for a degree at that institution.

Summer studies. Students enrolled at Blair may receive transfer credit for summer courses taken at another regionally accredited two-year or four-year college or university. This may include work at festivals or camps, if offered through a regionally accredited institution. To qualify for summer credit, a student must be in good standing, consult the Office of Academic Services, and submit courses for evaluation through the Transfer Credit Submission application in YES. A detailed course syllabus is required in order for a course to be evaluated. Deadline for pre-approval is April 1.

Semester work at another institution. Students wanting to receive transfer credit for a semester of work at another regionally accredited institution must receive approval in advance from the associate dean. To qualify for such credit, the student must be in good standing and must present a plan that makes

clear the educational rationale for such work, the ways in which it supplements the Vanderbilt curriculum, and the equivalence of standards to those at Vanderbilt. Approval of the overall plan must be followed by approval of specific courses by the associate dean and submission of courses for evaluation through the Transfer Credit Submission application in YES. A detailed course syllabus is required in order for a course to be evaluated. Students enrolled full time (i.e., carrying at least 12 credit hours) during a regular (fall or spring) semester are assumed to be engaged in full-time study at Vanderbilt. Such students are not permitted to take additional course work elsewhere, for transfer credit, during the semester. This includes online courses as well as courses offered by nearby institutions.

Transfer Students

Transfer applicants must comply with university standards (see the chapter on Admissions). The required audition is of major importance in the evaluation of any application. Composition applicants must submit a composition portfolio and interview with a member of the composition faculty.

Transfer students must submit catalog copy and course syllabi from the previous institution(s). A level of performance study is assigned based on the entrance audition. Credit for courses is subject to evaluation. Music courses may require an examination to verify placement and/or credit at Vanderbilt, and credit for non-music courses must be approved by the appropriate Vanderbilt department. Transfer students must complete at least half the credit required for the degree, or 63 hours, at the Blair School. See also, *Transfer courses*.

Intra-university transfer. Students intending to transfer within the university should meet with the head of academic advising and file appropriate paperwork. For students transferring out of the B.Mus. or B.Mus.Arts program, music fees are covered through the end of the final term as a B.Mus. or B.Mus.Arts student. All students are expected to maintain a minimum of 3 credit hours within their home school until transfer is approved. First semester freshmen are ineligible for transfer status. Students who transferred to Vanderbilt University from another institution are eligible for intra-university transfer after having completed one semester in residence and having achieved sophomore standing. See also, the chapter on Admissions.

Study Abroad

Four Vanderbilt study abroad programs are coordinated with the degree programs in music: the IES programs in Vienna, Austria, and in Amsterdam, The Netherlands, the DIS program at the Royal Danish Academy of Music in Copenhagen, Denmark, and the IFSA/Butler program at the University of Sydney and Sydney Conservatorium of Music in Sydney, Australia. These programs include provisions for lesson and ensemble credits, contingent upon audition and admission to the program. These will count towards the Blair music core and are covered at least in part by regular tuition and fees, although students are responsible for any instrument rental fees they accrue. All programs also allow for a range of liberal arts and elective credits. Students enrolled in IES Vienna will be required to enroll in German; there is, however, no language prerequisite for admission to the program. Further information can be obtained from the Vanderbilt Global Education Office, Suite 103, Student Life Center, or vanderbilt.edu/geo, and from Blair's associate dean.

Blair students may also elect any of the Vanderbilt-approved study abroad programs; see descriptions under "Study Abroad" in the front chapters of the catalog. Blair students in these programs have typically enrolled in music electives, courses in the liberal arts core, and course work toward minors and second majors. Students in these programs typically arrange alternative private lesson study, and those fees are usually not covered by tuition. It should be noted that if a program has been approved by Vanderbilt students must enroll in the program via the Global Education Office. In no case, after matriculating at Vanderbilt, may a student apply to participate in a program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt. Any student studying abroad must register with Vanderbilt's travel assistance service.

Registration

Registration is available to entering first-year students in June. Continuing students register on dates specified each semester in the University Calendar and as assigned in "YES" (Your Enrollment Services, yes.vanderbilt.edu). Conferences with faculty advisers are required before students may register. Detailed information on registration is available on the University Registrar website, registrar.vanderbilt.edu/registration/registration-information/.

Prior to registration, students should refer to the sample curriculum plans in the *Blair Student Handbook*. Records and the degree audit should be checked regarding progress toward completing the following:

1. Music core
2. Liberal arts core
3. Additional major area requirements

A student whose registration choices are denied or altered (full or cancelled class, lack of prerequisite courses, etc.) may select alternate courses during the Open Enrollment registration period.

Change of Course

Course changes may be made during the Open Enrollment period or the official Change Period (Drop/Add) as published in the University Calendar. All changes need the adviser's approval. A course dropped during the Change Period does not show on a transcript.

A course may be dropped or changed from P/F to graded status prior to the deadline for withdrawal published in the University Calendar. The approval of the adviser and associate dean is required (see Grading System regarding withdrawal grades). Regularly enrolled students must maintain a minimum course load of 12 hours.

Grading System

A:	excellent
B:	good
C:	satisfactory
D:	minimum pass work
F:	failure

Under certain circumstances the following grades may be awarded (see explanations below):

Pass:	D- or above
W:	withdrawal
M:	missed final examination (prior approval needed; see below)
I:	incomplete in some requirement other than final examination (see below)
MI:	missed final examination and incomplete in some other requirement

Plus and minus modifiers may be associated with letter grades *A* through *D* as shown in the table below. Grade point averages are calculated using indicated grade point values.

Defined Grades with Corresponding Grade Points Per Credit Hour

A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
C+	= 2.3	F	= 0.0

Grade Point Average

A student's grade point average is obtained by dividing the total grade points earned by the number of hours for which the student registered, excluding courses audited or taken for no credit, those from which the student has withdrawn or for which an incomplete grade (*I*, *M*, or *MI*) has been authorized, and those with the grade *Pass*.

Pass/Fail Option (Elective)

Students may elect to take a limited number of courses on a Pass/Fail (P/F) basis. To enroll for a course on a Pass/Fail basis, students must have completed at least two semesters at Vanderbilt, must have achieved at least sophomore standing, and must not be on academic probation. The Blair Office of Academic Services can assist with P/F registration.

For B.Mus. and B.Mus.Arts students, the Pass/Fail option is limited to courses taken as free electives. Course work in the area of a minor or second major is governed by the school in which the department or program is housed. No more than one course may be elected on a Pass/Fail basis in any one semester. Only a total of 18 hours towards the 126-hour degree total may be taken on a Pass/Fail basis. Students electing course work on a Pass/Fail basis must be enrolled for 12 graded hours. A graduating senior who has permission to take fewer than 12 hours on a graded basis may take one course on a P/F basis in addition to the courses required for graduation. If the student does not graduate at the end of that semester, the grade *P* is automatically converted to the grade actually earned.

Students may register for grading on a Pass/Fail basis until the close of the Change Period. Students may change from Pass/Fail to graded status until the deadline date for dropping a course that is published in the University Calendar.

Those electing the Pass/Fail option must meet all course requirements (e.g., reports, papers, examinations, attendance, etc.) and are graded in the normal way. Instructors are not

informed of the names of students enrolled on a Pass/Fail basis. At the end of the semester, a regular grade is submitted for the student enrolled under the P/F option. Any grade of *D-* or above is converted in the Student Records System to a *P*, while an *F* will be recorded if a student enrolled under this option fails the course. The *P* grade is not counted in the grade point average nor used in the determination of honors. The grade of *F* earned under the Pass/Fail option is included in the calculation of the grade point average.

Deficiency Notices

During the week after mid-semester, the Office of the University Registrar posts deficiency notices for students whose mid-semester grade in any course is a *C-* or below or whose work is incomplete (*I*). (Deficiency notices are found in the Academic Detail in YES at yes.vanderbilt.edu.) Deficiencies are issued as a matter of information and warning. Deficiencies do not show on transcripts, but information is sent to the faculty advisers and may be sent to parents of those students who are dependents of their parents or who have authorized such reports.

A student who receives a deficiency notice is required to meet with the faculty adviser before the deadline for withdrawal at the end of the week. A student with deficiencies in two or more courses or any senior who receives a deficiency notice is also required to meet with the associate dean before the deadline for withdrawal (usually Friday of the week after mid-semester).

W: Withdrawal

A student may withdraw from a course after the official Change Period and prior to the deadline for withdrawal published in the University Calendar, generally Friday of the week after mid-semester. A change of course request form must be signed by the instructor, adviser, and associate dean and filed with the Office of Academic Services. (Students from other schools of the university must file with their home school.) Withdrawals after the published deadline result in an *F*. The grade *W* may be assigned by the associate dean to a student who seeks to withdraw from a course or from school after the deadline for reasons such as extended illness or unusual personal or family problems. No *W* grades are calculated in a student's grade point average.

Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. A student who receives a temporary grade is ineligible for the Dean's List. Students cannot graduate with any temporary grades.

I: Incomplete

An Incomplete is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The *I* is not intended as a replacement for a failing grade, nor should it be given to a student who misses the final examination. The *M* grade is used for the latter purpose. The request for an Incomplete is generally initiated by the student and must be approved by the instructor. The instructor may initiate the assignment of an Incomplete if warranted by the circumstances and conditions referenced above. In either case, in assigning the grade of *I*, the instructor specifies (a) a default grade that counts the missing work as

zero and (b) a deadline by which the missing work must be submitted. That deadline must be no later than the last class day of the next regular semester in residence. The Incomplete can be extended beyond the next semester only if the student's associate dean determines that an extension is warranted. If the required work is submitted by the deadline for removing the Incomplete, the *I* will be replaced by the grade earned. If the work is not completed by the deadline, the default grade will become the permanent grade for the course.

The Incomplete is not calculated in the GPA, but a student who receives an Incomplete is ineligible for the Dean's List.

M: Missing a Final Examination

The grade *M* is given to a student who misses the final examination and is not known to have defaulted, provided the student could have passed the course had the final examination been successfully completed. The grade of *F* is given if the student could not pass the course even with the final examination.

It is the student's responsibility to contact the Dean's Office before the first class day of the next regular semester, regardless of whether the student will be in residence that semester, to request permission to take a makeup examination. The makeup examination must be taken on or before the tenth class day of the next regular semester. If the request has not been submitted by the proper time, or if the student fails to take the makeup examination within the prescribed time, the *M* grade will be replaced by a default grade submitted by the instructor when the *M* is assigned.

MI: Missing a Final Examination and Other Work

The grade *MI* is assigned to a student who misses the final examination and whose work is incomplete in other respects. The *MI* may not be turned in without prior authorization by the associate dean. It is the student's responsibility to contact the Dean's Office to request permission to take a makeup examination and to arrange for submission of the missing work.

No-Credit Courses (NC)

Students who wish to take courses on a no-credit basis must file with the Blair Office of Academic Services before the end of the Change Period. Students must attend class and complete all course work. A grade is recorded on the transcript with the notation "Grading Basis: No Credit Toward Current Degree," indicating that it does not count toward the degree.

No-credit courses count in the computation of a student's academic load and tuition, but not in the computation of the grade point average.

Auditing

Regularly enrolled Blair students who want to audit courses in any of the undergraduate schools of the university must complete the change of course request form and obtain the written consent of the instructor to attend the class but do not register for the course for credit. No permanent record is kept of the audit. Regular students may audit one class each semester.

Repeated Courses

Certain courses, notably performing ensembles and variable credit performance instruction, may be taken more than once for credit. Otherwise, students may repeat any course to

replace a grade, with no additional credit hours earned, subject to the following conditions:

Courses taken at Vanderbilt may not be repeated elsewhere.

A grade may not be replaced by a grade of "Pass."

A grade of *W* or *I* cannot replace a letter grade.

Only the most recent grade is calculated in the grade point average, but all grades show on the transcript.

Dead Week

The last week of classes, i.e., the last seven calendar days before the final examination period each semester, is designated as dead week. No examinations of any type, including quizzes, portions of final examinations, recitals, or ensemble performances, may be given during this time without the express written permission of the dean and notification of students at least two weeks before dead week. Violations should be reported to the dean.

Examinations

All examinations are conducted under the honor system. Primary and alternate exam schedules, which allow two hours for a final exam in each course, are listed on the University Registrar's website. The instructor may use the alternate schedule in addition to, but not instead of, the primary schedule.

Alternatives to standard in-class final examinations, such as term papers or take-home, self-scheduled, or oral examinations may be given at the instructor's discretion. A take-home exam is distributed at the last regular class meeting and must be completed by the latest time scheduled for the final examination.

Performance examinations are scheduled by department chairs. Students giving full recitals during the semester may be exempted from performance examinations at the discretion of the instructor. If performance examinations are scheduled on a reading day (the day after classes end, when no course examinations are scheduled), students are also given the choice of a different day for their performance examinations.

A student who misses a final examination may be eligible to receive the grade *M* (see Temporary Grades).

Grade Reports

Grade reports and faculty critiques of performance examinations will be provided to students as soon as possible at the end of each semester. Grades are available online in the Academic Record, which is housed within YES (Your Enrollment Services) at yes.vanderbilt.edu. Occasionally, student academic information may be shared with appropriate faculty committees for purposes of promotion and tenure review.

A grade reported and recorded in the Office of the University Registrar may be changed only upon written request of the instructor, on certification that the original report was in error, with approval of the associate dean.

Academic Standards

For the purposes of class standing, a regular semester is defined as any fall or spring term in which a student is registered for at least 12 hours.

Class Standing

To qualify for sophomore standing, a student must complete a minimum of 24 hours with a grade point average of 1.8 and have completed two regular semesters.

To qualify for junior standing, a student must complete a minimum of 54 hours with a grade point average of 1.9, must complete MUTH 2200 and MUSC 2200, and must have completed four regular semesters.

To qualify for senior standing, a student must complete a minimum of 86 hours with a grade point average of 2.0 and have completed six regular semesters.

Academic Probation

Students are placed on probation if they fail to meet class standing benchmarks, as noted above. Students on probation must qualify for class standing in one additional semester or risk being dropped from the university.

Students are placed on academic probation: if they fail to meet class standing benchmarks; if they complete fewer than 12 hours in a fall or spring semester except in cases involving documented mitigating circumstances (illness, injury, or family emergency); or if their semester grade point averages fall below 1.8 overall or 2.0 in music. In addition, freshmen are placed on academic probation if they do not complete one writing course. Incomplete grades may adversely affect class standing or grade point averages.

Students on academic probation may not transfer summer study credit, elect to take courses on a Pass/Fail basis, earn credit by departmental examination, or participate in any extracurricular performance activity. They are required to participate in a special academic advising program. Students will be placed on probation no more than twice. Students who are candidates for probation a third time will be dropped from the university.

Sudden Academic Insufficiency

Any student who fails by a wide margin to reach prescribed levels of academic achievement, either at the end of a semester or at mid-semester, is reviewed by the associate dean's office in conjunction with the academic and studio adviser(s). If the student is not making satisfactory progress towards the degree, the student may be placed on probation or may be advised or required to take a leave of absence or advised to withdraw from the university. Appeals of such findings should be addressed to the Blair Curriculum Committee.

Scholarship Student Requirements

Students receiving honor scholarships through Blair School of Music must be enrolled full time, taking all assigned music courses, must qualify for class standing, and must maintain each semester minimum grade point averages of 2.0 overall and 2.7 in music. Students receiving the Cornelius Vanderbilt Honor Scholarship must maintain a minimum 3.0 grade point average overall and 3.0 in music each year. Additional requirements may be stipulated in scholarship award letters.

Honor scholarship awards are considered for renewal annually. Student work will be reviewed at the end of spring semester for possible renewal for the following academic year. Incomplete grades may adversely affect renewal. A student who falls short of the requirements will normally have the scholarship for one semester of grace, after which, if requirements are still not met, the scholarship will be lost.

Students receiving scholarships or grants as part of their financial aid packages (not honor scholarships) must qualify for class standing in order to be considered for renewal each year. Students receiving federal aid are expected to make

satisfactory academic progress as outlined in the chapter on Financial Information.

Graduation Requirements

Candidates for degrees must have completed 126 hours and all curriculum requirements, have passed all prescribed examinations, and be free of indebtedness to the university.

Exceptions to stated degree requirements and procedures must be approved by the Curriculum Committee as the representative body of the faculty in matters pertaining to the curriculum.

The minimum grade point averages required for graduation are 2.0 overall and 2.0 in music. A student taking a second major must earn a 2.0 in that major in order for it to be certified on the transcript.

If requirements for graduation change, students may elect to be bound by requirements published in the *Undergraduate Catalog* in either their entering or their graduating year.

Immersion Vanderbilt

To fulfill the university requirement of Immersion Vanderbilt, a student must participate in an intensive learning experience that takes place in and beyond the classroom and culminates in the creation of a tangible final project. This requirement applies to all students who enter Vanderbilt as first-year students in or after summer 2018, as second-year students in or after summer 2019, or as third-year students in or after summer 2020.

Immersion Vanderbilt is divided into four broad pathways: civic and professional, creative expression, international, and research. The pathway selected by the student may focus on one or more than one of these areas and should provide a structure upon which students can brainstorm, plan, and execute their immersive projects across multiple years.

Most Blair students will take advantage of the senior recital experience or honors thesis in ethnomusicology/musicology to satisfy the requirements of Immersion Vanderbilt. However, students may choose to pursue an Immersion plan outside their home program. Students should consult the Office of Immersion Resources (OIR). Completion of the Immersion Vanderbilt graduation requirement will be shown on the student's degree audit, and the title of the Immersion project will be added to the student's transcript.

vanderbilt.edu/immersion

Residence Requirement

A minimum of four semesters and at least 63 credit hours, as well as the last two semesters and the last 30 credit hours, must be spent in residence in the Blair School. Students transferring from other schools of the university must spend the last two semesters and at least the last 30 credit hours in residence in the Blair School. Students who wish to study abroad or study away in their penultimate semester may petition the Blair Curriculum Committee for a waiver of the residence requirement.

Senior Re-examination

A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed would prevent the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from re-examination. The re-examination must be requested through the student's associate dean's office, and, if approved, it is

given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination will receive a D- in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course. Note: For engineering students taking engineering courses, the senior re-examination policy applies if a student fails not more than one course in the senior year.

Writing Portfolio

Students in their senior year are required to submit a writing portfolio drawn from academic course work from one or more classes to be evaluated by a faculty committee. Emphasis should be placed on demonstrating an ability to write clearly and effectively and on the student's ability to form connections across two or more disciplines. Students are required to prepare a one-paragraph narrative explaining how the submitted work demonstrates the required competencies.

Degree Audit Reports

An online degree audit is available on YES to all Blair students, showing total hours earned, degree requirements completed, and those still to be met. Students should examine the audit carefully with their faculty advisers. Problems or suspected errors should be discussed immediately with the Blair Office of Academic Services.

Credit by Departmental Examination

In certain circumstances, students may be awarded course credit (a maximum of 8 hours) by departmental examination. This procedure is distinct from the awarding of credit through the College Board Advanced Placement Tests or the International Baccalaureate. Students apply for credit by examination through the Blair Office of Academic Services.

To earn credit by departmental examination, students must be enrolled for at least 12 hours, be in good standing, be recommended by their advisers, and have the approval of the appropriate department. In addition, students must seek prior approval of their study plan through the associate dean's office. Students may attempt to earn credit by examination in no more than two courses in one semester, only once in any course in one semester, and no more than twice in the same course.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 hours are not charged extra tuition for hours earned through credit by examination, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses and courses dropped after the change period. Students in this category must pay a \$50 fee for the cost of constructing, administering, and grading the examination. Since this cost has already been incurred, students who refuse the credit hours and grade are charged the \$50 fee nevertheless. Full-time students with a tuition load exceeding 18 hours and students taking fewer than 12 hours pay tuition at the regular rate, per credit hour, with no additional fee.

Independent Study

Students must obtain permission to enroll in Independent Study from the instructor of their choice prior to registration. Independent Study authorization forms are available at

blair.vanderbilt.edu/academics. The instructor's signature on the authorization form indicates a willingness to supervise the Independent Study project. A contract or study plan, approved by the instructor in consultation with the appropriate department chair and the associate dean, must be submitted to the Blair Office of Academic Services by the tenth calendar day after classes begin. If no plan is submitted, the student will be dropped from Independent Study. An Independent Study project should result in a substantial written report, paper, or lecture/recital. The report, recording, or some physical manifestation of the project should be retained by the instructor. Independent Study projects proposed by students for cross-school registration must be approved through the mechanisms of both schools. Consult associate deans from both schools for guidance.

A student may register for a maximum of 3 hours in Independent Study in a semester. A student may count a total of 6 hours in Independent Study toward the degree. A faculty member may supervise no more than four students per semester in Independent Study projects.

Independent Study cannot substitute for courses which are part of the curriculum.

Internships

The Career Center assists students interested in internship opportunities in the music industry and elsewhere; there are opportunities in many states of the U.S. and also abroad, both during the academic year and in the summer. A student serving as an intern may register for MENT 3880, 3881, or 3882 as a corollary if credit is desired. Students with summer internships that require an academic component must register for credit (vanderbilt.edu/career/summer-internship-subsidy). A maximum of 6 hours of internship credit may be counted toward the degree. Students are responsible for finding a faculty sponsor; a written study plan must be approved by the faculty sponsor and the Blair associate dean no later than the tenth day of classes. Internship paperwork is available on the Blair School website at blair.vanderbilt.edu/academics.

Performance Instruction: B.Mus. and B.Mus.Arts Degrees

Fees. Performance instruction fees are waived for B.Mus. and B.Mus.Arts students. A one-time music technology fee is charged to each first-year student.

Elective credit. B.Mus. and B.Mus.Arts students taking a second instrument normally enroll in 1100-level performance instruction for 1 or 2 hours elective credit. Consent of the instructor is required. B.Mus. and B.Mus.Arts students who have declared a minor instrument also register for performance instruction at the 1100 level; consent of the instructor and notification of the Blair Office of Academic Services are required.

Composition Majors. Students register for performance instruction at the 1100 level. A minimum of 6 semesters of study totaling 6 credit hours is required.

Integrated Studies Majors, Integrated Studies/Teacher Education Majors, and B.Mus.Arts students. First-year students and sophomores register for 2100-level performance instruction in their primary area. Juniors and seniors register for 4100-level performance instruction in their primary area. A minimum of 8 semesters totaling 16 credit hours required; performance instruction required every semester in residence.

Performance Majors. First-year students and sophomores register for 2200-level performance instruction in their primary area. Juniors and seniors register for 4200-level instruction in their primary area. A minimum of 8 semesters totaling 32 hours (instrumental performance majors) or 28 hours (vocal performance majors) required; performance instruction required every semester in residence.

Upper Divisional Hearing (Performance Majors Only)

Requirements for performance majors include an upper divisional hearing in the sophomore year to determine continuance in the performance degree program and permit subsequent enrollment in upper division study at the 4200 level. Students are required to perform a program of twenty to thirty minutes for a faculty committee convened by the studio instructor or by the department chair. The committee will normally consist of the student's studio teacher and at least two additional members of the department. Memorization is required as appropriate, and accompaniment is expected where called for.

The student must consult with the studio instructor regarding appropriate repertoire. Instrumental selections must be chosen from the solo repertoire and should represent diverse historical periods. Percussionists must perform on keyboard percussion, timpani, and snare drum and/or multiple percussion. String repertoire must include solo Bach. Pianists must perform a 30-minute memorized program of solo piano literature representing at least three style periods. Vocal repertoire must include a minimum of five songs of contrasting periods and styles, using three languages (Italian, English, and either French or German).

Failure to pass this hearing demonstrates a lack of the requisite skills to graduate in performance at Blair, necessitating transfer to another degree program. A student may petition the faculty once for a second hearing, with entirely different repertoire, to take place before the end of the first semester of the junior year.

Solo Recitals

Pre-Recital Hearing

All students (excepting composition) giving required recitals and any student who wishes to give a recital in the Blair building must pass a hearing, held at least three weeks before the recital. After establishing a recital date, the student, with guidance from the studio instructor, will assemble a recital hearing committee, consisting of two additional faculty members, one of whom must be from outside the student's performing area. For integrated studies/teacher education students, the committee will normally consist of the studio instructor, a teacher education faculty member, and at least one additional faculty member. For non-required, non-credit recitals, the hearing committee may be from within the department. For any recital involving a student's second performing medium, the student must seek approval from the studio instructor and department chair of the secondary and primary performing areas; in addition, a full-time faculty member from the secondary performing area must be part of the hearing committee. The student must notify the recital hearing committee, in writing, of the hearing date, recital date, time, and place. Senior composition recitals are screened in advance at the department level.

For a required junior or senior recital, the repertoire will normally encompass three major style periods, as appropriate to the medium; at least one work in a contemporary idiom

will be included in either the junior or senior recital. For teacher education students, a conducting component must be included on the required senior recital. A required senior recital must also include written or spoken program notes, visual media, or other audience engagement component, with the approval of the studio instructor. The hearing committee should hear all of the recital repertoire. Grading of the hearing is on a Pass/Fail basis, with written faculty comments. If a student fails the hearing, another must be scheduled. Only two recital hearings in one semester are permitted.

Recital and Recital Committee

For recitals given for credit, the recital committee is the same as the hearing committee whenever possible. The final grade is a composite of those of at least two committee members, including the studio instructor, with the studio instructor's grade valued at two thirds of the total. Copies of committee member's grades are kept by the instructor. Recitals not given for credit are not graded; they involve a hearing committee but not a recital committee.

Extracurricular Performance

Students must be in good standing and have the consent of their private instructors in order to participate in any extracurricular performance activities, including in-school collaboration, that are not required by a student's degree program or honor scholarship.

Recital Attendance

Each semester in residence, students (except graduating seniors in their penultimate or final semester) are required to register for and attend weekly student recitals/convocations on Fridays at 12:10 p.m. and a minimum of six Blair faculty or professional concerts or their community equivalents as described on the syllabus. Students must fulfill both aspects of the requirement to pass each semester. The course receives zero credit hours but is graded on a Pass/Fail basis and listed on students' transcripts. Incompletes will not be granted except in the case of documented medical emergency.

Students must register their attendance at each recital. Two absences from Friday afternoon recitals are permitted each semester. Under extraordinary circumstances, make-up assignments can be obtained from the recital attendance coordinator with the permission of the associate dean. Students must plan and keep up with their concert attendance. Except for weekly student recitals, performances in which students are participants do not fulfill the attendance requirement for the performer. Deadline for completion of all work is listed on the course syllabus for MUSO 1000. The first failure would result in the loss of the senior penultimate or final semester exemption. Additional failure(s) would require students to enroll for additional semester(s) until the seven required semesters are passed.

Change of Address

Any change of address should be submitted to the Office of the University Registrar at yes.vanderbilt.edu. The university will consider notices or other information delivered if mailed to the address currently on file.

Leave of Absence

A student in good standing may, with the approval of the associate dean, take leave of absence for one or two semesters. Application forms, available from the Blair Office of Academic Services, must be submitted by 1 December for spring semester leave or by 1 May for fall semester.

Students planning to study elsewhere while on leave (elective courses) must have prior approval if credits are to be transferable. Upon the student's return, a performance examination during the first two weeks of the semester may be needed to determine the student's standing in the major performance area.

Registration notifications are emailed to students on leave. A student failing to register at the conclusion of the stated leave will be withdrawn from the university and must apply for readmission.

Students who have been on leave of absence and not enrolled for three or more semesters or who leave the university while on academic probation must re-audition and achieve the approval of the associate dean prior to readmission.

Withdrawal from the University

Students proposing to withdraw from the university during any semester must report to the Blair associate dean to initiate proper clearance procedures. Students are graded on the same basis as if withdrawing from a course. Students who withdraw before the end of the eighth week of classes receive a partial refund of tuition (see the chapter on Financial Information). Students intending to withdraw from the university for the following semester should notify the Blair Office of Academic Services by 1 December for spring semester or by 1 May for the fall semester.

Students who have withdrawn from the university without filing a Leave of Absence form must apply for readmission if they wish to return.

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Honors

Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the Dean after consideration of faculty recommendations as well as grade point averages of the year's highest ranking graduates.

Academic Honors Designation

Honors, which are noted on diplomas and published in the *Commencement Program*, are earned as follows:

Summa Cum Laude. Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's graduating seniors.

Magna Cum Laude. Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's graduating seniors.

Cum Laude. Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's graduating seniors.

Honors Program in Musicology and Ethnomusicology

The honors program in musicology and ethnomusicology is designed to afford superior students the opportunity to pursue more intensive work within the field of musicology or ethnomusicology, culminating in the preparation of a senior honors thesis. The course of study includes seminar work as well as independent study and writing under the supervision of a thesis adviser. Students who want to do honors work should contact the chair of the musicology and ethnomusicology department in the fall of their junior year. Departmental approval of a formal honors thesis prospectus must take place prior to registration for MUSL 4998 in spring of the junior year or fall of the senior year. Minimum requirements are a 3.0 GPA overall and 3.3 in musicology and ethnomusicology courses.

Students accepted into the program must take a total of 9 credit hours: MUSL 4998–4999, Senior Honors Thesis (6 hours), and one course (beyond the MUSL core) chosen from MUSL 3150, 3220–3240, 3160, 2610, or 3890 (3 hours). In addition, successful completion of the honors program requires an oral defense of the honors thesis before a faculty committee. This defense will occur at the end of the second semester of thesis enrollment. Those enrolled in the program who successfully complete its requirements with distinction may graduate with Honors or Highest Honors in musicology and ethnomusicology.

Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded hours, with no temporary or missing grades in any course (credit or non-credit), and no grade of *F*.

Pi Kappa Lambda

Election to Pi Kappa Lambda National Music Honor Society signifies superior accomplishment in the field of music. Students elected to membership must be outstanding musically and scholastically and ranked in the highest 20 percent of the senior class or the highest 10 percent of the junior class. The Eta Iota chapter was installed at Vanderbilt on April 8, 1992. Professor Karen Ann Krieger serves as its president.

Awards and Prizes

Several awards are presented to students at the Blair School of Music. Announcement is made at the final student recital/convocation of the spring semester. Each carries a monetary stipend. Awards, which are published in the *Commencement Program*, are as follows:

THE SPIRIT OF BILLY ADAIR AWARD is given to a sophomore or junior who exhibits the qualities of leadership, mentorship, excellence and musicianship, and service within the jazz program at Blair.

THE MARGARET BRANSCOMB PRIZE is given annually to a Blair freshman judged by the faculty to have the musical and personal qualities that best exemplify the spirit and standards of the school. The prize was established by family and friends in memory of Margaret Branscomb, wife of the late Vanderbilt Chancellor Emeritus Harvie Branscomb.

THE SUE BREWER AWARD was established by the Songwriters Guild Foundation in memory of Sue Brewer, who befriended many of Nashville's struggling songwriters in the late 1960s and 1970s. It is awarded for excellence to a student pursuing a degree in guitar or composition.

UNDERGRADUATE COMPOSITION AWARD. The Undergraduate Composition Award is awarded by the composition faculty to a student of junior or senior status who has made an outstanding contribution to the Blair School's composition program, through creative output, academic excellence, and personal dedication. Given in honor of Sean William Calhoun, B.Mus.'14.

THE RICHARD C. COOPER AWARD was established in 2002 by the Pi Delta Chapter of Phi Mu Alpha Sinfonia, to remember the outstanding contributions made by Chris Cooper to the student experience of music at Vanderbilt. Nominations are made by student organizations, recognizing campus-wide leadership in music.

THE ROBIN DICKERSON AWARD was established in 1995 in honor of soprano Robin Nell Dickerson, B.Mus.'94, by Blair faculty and students. It is awarded by the voice faculty to an outstanding voice major for excellence in performance and scholarship.

THE ANDREW SANG HAN MEMORIAL AWARD was established in memory of Sang Han, a clarinet performance major at Blair from 2012 to 2015. Sang's dedication to excellence in all areas of performance, from small chamber ensembles to wind symphony and orchestra, as well as the care and consideration he showed his peers, served as an example to his friends and colleagues at the Blair School. This award is presented through collaboration between the ensemble directors and woodwind/brass faculty to a woodwind or brass student who demonstrates remarkable musicianship and leadership in all areas of ensemble playing.

THE JEAN AND ALEXANDER HEARD AWARD. Awarded to outstanding students studying at summer music festivals.

THE JEAN KELLER HEARD PRIZE is designed for a string student seeking the Bachelor of Music degree. The scholarship fund was established by the Vanderbilt Women's Club to honor violinist Jean Keller Heard, wife of Vanderbilt's fifth Chancellor, Alexander Heard.

THE MAGDA LACHS AWARD is funded by Vanderbilt's Centennial Professor of Philosophy, John Lachs, and is made in memory of his mother, Magda, a passionate opera enthusiast, and his father, Julius Lachs. It is given to an outstanding voice or orchestra student who participated in the current year's Vanderbilt Opera Theatre production.

THE S. S. AND I. M. F. MARSDEN AWARD is awarded annually to a Blair student for excellence in scholarship, e.g., a major written paper, on a topic that lies outside the normal core of scholarship. Honors projects, independent study projects, and substantial class papers are eligible for consideration for the award. Only papers of extraordinary scope, additional outside recognition, or unusual range beyond the normal core of scholarship are eligible for the Marsden Award.

THE DELENE LAUBENHEIM MCCLURE MEMORIAL PRIZE is given to a voice major who exhibits excellence in opera performance. This prize was established by alumni and faculty of the Blair School of Music and other friends of Delene Laubenheim McClure, B.Mus.'91, whose untimely death foreshortened a promising career in music. Through her participation in Blair's first opera productions, Dede helped set a standard for excellence in performance.

THE MICHELSON COLLABORATIVE ARTS AWARD is presented to a singer, pianist, or voice/piano duo for exceptional performance in vocal collaborative arts.

THE ELLIOT AND AILSA NEWMAN PRIZE is presented annually to a promising clarinetist or woodwind student for excellence in performance. The prize was endowed by Ailsa Mackay Newman in memory of her husband, Vanderbilt's Werthan Professor of Experimental Medicine, 1952–1973, and an avid amateur clarinetist.

THE L. HOWARD "ZEKE" NICAR AWARD is presented annually to the most outstanding woodwind or brass student. The award was established by family, faculty, and friends to honor the memory of the Blair School's first assistant dean for admissions.

THE EXCELLENCE IN PERCUSSION PERFORMANCE AWARD was established in memory of James Harrison Griggs, an outstanding percussion major, B.Mus.'94. This award is given to a percussion major for excellence in performance.

THE PRESSER AWARD is presented to a Blair junior for musical and academic excellence. At least one-third of the student's credits must be outside the field of music. The recipient must have a cumulative grade point average of 3.25 and have been named to the most recent Dean's List. The award honors the memory of Theodore Presser, American publisher and musical philanthropist.

THE DAVID RABIN PRIZE was established by family and friends in memory of Dr. David Rabin, professor of medicine and of obstetrics and gynecology at Vanderbilt University Medical School, 1975 to 1984. The prize is awarded annually, based on excellence in musical performance, to a student enrolled at Blair. The fund continues to grow as contributions in honor of Dr. Rabin are given to the school.

THE SIGMA ALPHA IOTA COLLEGE HONOR AWARD is given annually to the most outstanding member of the chapter based on scholarship, musicianship, participation in school activities, and contribution to the fraternity chapter. The award was established in 2000.

THE SIGMA ALPHA IOTA SCHOLARSHIP AWARD is given to the graduating senior who has attained the highest scholastic average during her college years. The award was established in 2000.

The STUDENT CITIZEN AWARD is given to the sophomore or junior judged by the entire faculty to have the musical and personal qualities that best exemplify the spirit and standards of the school, especially by sharing their talent and training in music as a service to others. The award is established by Madeline Myers, B.Mus.'11, in memory of her father, James Agnew Myers.

THE ACHIEVEMENT IN TEACHING AWARD is presented by the faculty to a senior who has demonstrated superior abilities in teaching. The recipient must intend to teach music professionally in an independent studio, in a classroom, or at the collegiate level.

THE CHRISTIAN TEAL AWARD recognizes a current string student who embodies the collaborative spirit of Professor Christian Teal, who retired as Joseph Joachim Professor of Violin after forty-two years at the Blair School.

THE BLAIR VOLUNTEER SERVICE THROUGH MUSIC AWARD was given by an anonymous donor and recognizes an outstanding student who has used music in service to others, particularly at W. O. Smith Community Music School.

THE MARTIN WILLIAMS AWARD was established in memory of Martin Williams, former director of the Smithsonian Institution's Jazz Program and Adjunct Professor of Jazz History at Blair. It is presented to the student writing the most outstanding class paper during the academic year.

Blair School of Music Courses

Courses are listed in alphabetical order by prefix:

COMP:	Composition
MCON:	Conducting
MENT:	Arts Advocacy, Career Development, and Entrepreneurship
MPED:	Pedagogy
MREP:	Orchestral Repertoire and Instrument Literature
MUED:	Teacher Education
MUKH:	Keyboard Harmony
MUSC:	Musicianship
MUSE:	Ensembles
MUSL:	Musicology/Ethnomusicology
MUSO:	Other Music Courses
MUTH:	Music Theory
MWEL:	Musicians' Wellness
Performance Instruction: Group and Individual (by instrument)	
Performance Classes (by instrument)	

COMP: Composition

COMP 1000. Composition Studio Class. [Formerly MUSO 111C] Weekly observation and participation. Required of all composition majors, including musical arts and integrated studies. Offered on a pass/fail basis. [0] Slayton, Link, Kurek, Michael Rose.

COMP 1100. Composition Workshop. [Formerly MUSC 230] Collaborative workshop open to composition majors and non-majors. Includes introduction to compositional techniques, study of composers and their works, principles of scoring, and the study of notation, including experimental types. Prerequisite: MUTH 1210, MUTH 2200, or equivalent skills. FALL. [3] Kurek.

COMP 2100. Composition (Elective). [Formerly MUSC 230E] Individual instruction and seminars. A variety of media, styles, and forms. Electronic and experimental techniques. Prerequisite: COMP 1100 and consent of instructor. [Variable credit: 1-3 each semester] Kurek, Link, Michael Rose, Slayton.

COMP 2301. Intermediate Composition I. [Formerly MUSC 141; COMP 1150] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. [2] Kurek, Link, Michael Rose, Slayton.

COMP 2302. Intermediate Composition II. [Formerly MUSC 142; COMP 2200] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Prerequisite: COMP 2301. [2] Kurek, Link, Michael Rose, Slayton.

COMP 2303. Intermediate Composition III. [Formerly MUSC 143; COMP 2300] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Prerequisite: COMP 2302. [3] Kurek, Link, Michael Rose, Slayton.

COMP 2304. Intermediate Composition IV. [Formerly MUSC 144; COMP 2400] Individual instruction and seminar. A variety of media, styles, and forms. Electronic and experimental techniques. Open only to composition majors; instructor as assigned. Prerequisite: COMP 2303. [3] Kurek, Link, Michael Rose, Slayton.

COMP 3978. Junior Thesis. [Formerly MUSC 228] Completion of an extended paper based upon musical analysis. Open only to composition majors. Topic subject to approval. Progress monitored via tutorials. Completion of Junior Thesis is prerequisite for COMP 4970 and COMP 4303. [1] Kurek, Link, Michael Rose, Slayton.

COMP 4301. Advanced Composition I. [Formerly MUSC 241A; COMP 4300] Continuation of 2301-2304. Open only to composition majors. A 4th credit hour may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: COMP 2304. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

COMP 4302. Advanced Composition II. [Formerly MUSC 241B; COMP 4301] Continuation of 2301-2304. Open only to composition/theory majors. A 4th credit hour may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: COMP 4301. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

COMP 4303. Advanced Composition III. [Formerly MUSC 241C; COMP 4302] Continuation of 2301-2304. Open only to composition/theory majors. A 4th credit hour may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: COMP 4302, COMP 3978. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

COMP 4304. Advanced Composition IV. [Formerly MUSC 241D; COMP 4303] Continuation of 2301-2304. Open only to composition majors. A 4th credit hour may be elected with instructor approval for focused opportunities such as analysis, repertoire study, etc. Prerequisite: COMP 4303. [3-4 each semester] Kurek, Link, Michael Rose, Slayton.

COMP 4970. Senior Composition Recital. [Formerly MUSC 299] Planning, rehearsing, and performing in a concert devoted solely to a student's own work. Open only to composition majors. Corequisite: COMP 4303. [1] Kurek, Link, Michael Rose, Slayton.

MCON: Conducting

MCON 3000. Conducting. [Formerly MUSO 261] An introductory course of study stressing the fundamentals of movement and gesture as they relate to style, articulation, phrasing, tempo, cueing, etc. Score reading at the piano. Prerequisite: MUSC 2200, MUKH 1134 or 2134, and MUTH 2400. FALL, SPRING. [2] Fountain, P. Schneller, Verrier.

MCON 3010. Instrumental Conducting. [Formerly MUSO 262] Expansion of basic skills to include longer and more complex musical structures; expanded ability in analysis, memorization, and interpretation; significant independent preparation. Prerequisite: MCON 3000 and consent of instructor. SPRING. [2] Fountain.

MCON 3020. Choral Conducting. [Formerly MUSO 263] Choral conducting and rehearsal techniques, score reading and analysis, methods, and materials of choral music. Prerequisite: MCON 3000 and consent of instructor. SPRING. [2] Biddlecombe. (Offered alternate years.)

MCON 3040. Score Reading I. Introduction to score reading at the keyboard in preparation for advanced study in conducting. Development of sight-reading and choral rehearsal skills; two- to four-part score reading. [1]

MCON 3041. Score Reading II. Builds on skills learned in Score Reading I. Reading two- to four-parts at the keyboard in all clefs in preparation for advanced score-reading. Continued development of eye-hand coordination and sight-reading skills. Systematic introduction of transposing orchestral instruments. Prerequisite: MCON 3040 and permission of instructor. [1]

MENT: Arts Advocacy, Career Development, and Entrepreneurship

MENT 1120. The Business of Music. [Formerly MUSO 100] A general survey of music in the world of commerce. Systems of the contemporary music business, with special emphasis on the recording industry.

Music business professionals as guest lecturers. FALL, SPRING. [3] Porter.

MENT 1130. Building Communities through Music and the Arts. [Formerly MUSO 106] The philosophical and strategic background for and practical skills in audience-focused and audience-engaged arts programming. Techniques to make music both accessible and relevant to learners; development of interactive programs and curriculum-directed programs; form, structure, and pacing of programs, including repertoire selection and duration, presentation of music, and participatory experiences. FALL. [1] Korn.

MENT 1135. Arts Administration: Best Practices and Careers in the Arts Organization Marketplace. A study of best practices and development of marketable skills in arts administration. Investigation of arts administration employment opportunities, roles and responsibilities in executive leadership, finances, fundraising, artistic leadership, education, organizational development, and marketing and media. Leading arts institutions are studied as models for arts administration careers and professional advancement. Guest artist administrators will further class discussion and real world application. [1]

MENT 1140. Creating Funding and Non-Profit Vehicles for 21st Century Community Service. [Formerly MUSO 107] Strategies for planning, financing, supporting, and sustaining an artistic and social development mission. Specific tools for creating mission-driven music, arts and community service organizational structures. SPRING. [2] Korn.

MENT 3100. Career Preparedness: The Business of a Music Professional. [Formerly MUSO 201] Prepares students for a career in music and its related fields. Emphasis on essential skills for resumé writing, financial management, interviewing/auditioning, media relations, copyright/ownership, career adaptability, and developing an artistic vision. Prerequisite: Junior and senior B.Mus. students and second majors in music. FALL. [1] Korn.

MENT 3110. 21st Century Artistry: Advanced Skills in Live Performance, Technology, and Communication. [Formerly MUSO 233] Skills for artistry, employment, audience engagement, communications, and the business of live music performance and recording. Emphasis on live and recorded stage and communication presentation; use of laptops as recording and live technologies; and creative application of technology, creativity, advocacy, and business skills for employment. Prerequisite: MUTH 2400 or permission of instructor. FALL. [3] Korn.

MENT 3880. Music Internship. [Formerly MUSO 280A] Academic research and writing related to a corequisite internship experience under the direction of a faculty sponsor. Prerequisite: 2.9 GPA, sophomore standing, and approval of project prospectus by faculty sponsor and by associate dean. May be repeated for credit, up to 1 credit hour per semester of enrollment. FALL, SPRING. [1].

MENT 3881. Music Internship. [Formerly MUSO 280B] An extensive academic program of study related to a corequisite internship experience under the direction of a faculty sponsor. Prerequisite: 2.9 GPA, sophomore standing, and approval of project prospectus by faculty sponsor and by associate dean. May be repeated for credit, up to 3 credit hours per semester of enrollment. FALL, SPRING, SUMMER. [3].

MENT 3882. Summer Music Internship. [Formerly MUSO 280C] Academic research and writing related to a corequisite internship experience under the direction of a faculty sponsor. Prerequisite: 2.9 GPA, sophomore standing, and approval of project prospectus by faculty sponsor and by associate dean. Offered on a pass/fail basis only. May be repeated for credit, up to 1 credit hour per semester of enrollment. SUMMER. [1].

MPED: Pedagogy

MPED 3110. Piano Pedagogy. [Formerly MUSO 266] Principles and procedures of teaching piano. Individual and group instruction techniques observed and discussed. Practicum with private students. Designed for B.Mus. and B.Mus.Arts piano majors. Permission of instructor required. FALL. [2] Krieger. (Offered alternate years)

MPED 3120. Suzuki Violin Pedagogy. [Formerly MUSO 265A] Principles and procedures of teaching violin using the Suzuki Violin School, books 1-4. Individual and group instruction techniques observed and discussed. Designed for junior or senior violin/viola students. Violin for class use required. Open by consent of instructor. FALL. [3] (Offered alternate years)

MPED 3121. Suzuki Violin Pedagogy. [Formerly MUSO 265B] Principles and procedures of teaching violin using the Suzuki Violin School, books 1-4. Individual and group instruction techniques observed and discussed. Designed for junior or senior violin/viola students. Violin for class use required. Open by consent of instructor. Prerequisite: MPED 3120. SPRING. [3] (Offered alternate years)

MPED 3125. Violin/Viola Pedagogy. Principles and procedures of teaching violin and viola. Emphasis on pedagogical literature and specific teaching techniques. Practicum with private students. Prerequisite: B.Mus. and B.Mus.Arts students with completion of four semesters of 2100 or 2200 in violin or viola. [2] McGann.

MPED 3127. Cello Pedagogy. Early cello pedagogy, with strong emphasis on the major pedagogical influences of Suzuki. Prerequisite: B.Mus. and B.Mus.Arts students with completion of four semesters of CLLO 2100 or 2200. [2] Cassel Greer.

MPED 3128. Harp Pedagogy. Principles and procedures of teaching harp. Emphasis on pedagogical literature and specific teaching techniques. Prerequisite: B.Mus. and B.Mus.Arts students with completion of four semesters of HARP 2100 or 2200, or permission of instructor. FALL. [2] Agresta Copely.

MPED 3142. Brass Pedagogy. Principles and procedures of teaching brass instruments. Emphasis on pedagogical literature and specific teaching techniques. Prerequisite: B.Mus. and B.Mus.Arts students with completion of two semesters of 2100 or 2200 in a brass instrument, or permission of instructor. FALL. [2] Wilson.

MPED 3144. Percussion Pedagogy. Principles and procedures of teaching percussion instruments. Emphasis on pedagogical literature and specific teaching techniques. Prerequisite: B.Mus. and B.Mus.Arts students with completion of four semesters of PERC 2100 or 2200. SPRING. [2] Jung.

MPED 3130. Vocal Pedagogy. [Formerly MUSO 269] Principles and procedures of teaching voice. Psychological and physiological approaches. Practicum with private students. Corequisite: VOIC 4100 or VOIC 4200 FALL. [2] Nelson.

MPED 3140. Woodwind Pedagogy. Principles and procedures of teaching woodwind instruments. Emphasis on pedagogical literature and specific teaching techniques. Prerequisite: B.Mus. and B.Mus.Arts students with completion of four semesters of 2100 or 2200 in major instrument, or permission of instructor. [2]

MPED 3870. Pedagogy Practicum. [Formerly MUSO 271] Principles and procedures of private teaching. Reading and research under the direction of a faculty sponsor, consistent with requirements for independent study. Practicum with private students. Consent of the faculty sponsor is required. [Repeatable for credit, variable 1-2 hours each semester] Staff.

MPED 3880. Pedagogy Internship. [Formerly MUSO 281] Focused experience in the teaching of performance under the direction of a faculty sponsor in that performance area (consent required). Involves a specific program of regular consultation between student and supervising teacher. Open only to students seeking concentration in pedagogy. Prerequisite: MREP 3310 or 3311, 3300, 3330, or MUSO 3850 (in field) and MPED 3110, 3100, or 3130 or MUSO 3850 (in field). [Repeatable for credit, variable 1-3 hours each semester] Staff.

MREP: Orchestral Repertoire and Instrument Literature

MREP 2110. Brass Orchestral Repertoire. [Formerly MUSO 252] Exploration of the standard orchestral repertoire with emphasis on the

late romantic period. Performance of selected excerpts, coached and conducted. May be repeated for credit. FALL. [2] Wilson.

MREP 2120. Orchestral Repertoire for Percussion. [Formerly MUSO 253A] Exploration of the standard orchestral repertoire for percussion instruments, exclusive of timpani, with emphasis on score analysis, instrument selection, and performance techniques. Selected excerpts coached and conducted. SPRING. [1] Jung.

MREP 2121. Orchestral Repertoire for Timpani. [Formerly MUSO 253B] Exploration of the standard orchestral repertoire for timpani. Emphasis on score analysis, editing, stick selection, and performance practice. Selected excerpts coached and conducted. [1] Vinson.

MREP 2130. String and Harp Orchestral Repertoire. [Formerly MUSO 254A] Analysis and coaching of the standard orchestral repertoire, including opera and ballet, with emphasis on style and technical problems. Selected excerpts in like instrument groups (violin, viola, cello, bass, harp). May be repeated for credit. [1] Iwasaki, Mansell, Reinker, Reist, Wanner, Agresta Copely.

MREP 2140. Woodwind Orchestral Repertoire. [Formerly MUSO 251] Exploration of the standard orchestral repertoire with emphasis on performance practice. Performance of selected excerpts, coached and conducted. Not recommended for freshmen. May be repeated for credit. SPRING. [1] Woodwind faculty.

MREP 2141. Saxophone Orchestral and Wind Band Repertoire. Exploration of the standard orchestral and wind band repertoire with emphasis on performance practice. Performance of selected excerpts, coached and conducted. Not recommended for freshmen. Prerequisite: B.Mus. and B.Mus.Arts students or permission of instructor. [1] Utley.

MREP 3310. Piano Literature I. [Formerly MUSO 256A] A survey of works for piano from the seventeenth through the nineteenth centuries, within the context of historical perspective, stylistic awareness, and pianism. Designed primarily for piano majors. SPRING. [2] Nies, Wait. (Offered alternate years)

MREP 3311. Piano Literature II. [Formerly MUSO 256B] A survey of works for piano from the nineteenth through the twenty-first centuries, within the context of historical perspective, stylistic awareness, and pianism. Designed primarily for piano majors. FALL. [2] Nies, Wait. (Offered alternate years)

MREP 3330. Vocal Literature. [Formerly MUSO 259] Survey of literature for solo voice from the seventeenth century to the present, with focus on traditional art songs of the great masters of the genre. Prerequisite: MUTH 2300, MUSL 2200W. Corequisite: VOIC 4100 or VOIC 4200. FALL. [2] Jarman. (Offered alternate years)

MUED: Teacher Education

MUED 1010. Woodwind Methods. [Formerly MUST 101] Development of performance skills and teaching methods for flute, clarinet, oboe, bassoon, and saxophone. Includes teaching techniques and problems relative to woodwind instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students or by permission of instructor. FALL. [1] Utley, Dunnivant.

MUED 1020. Brass Methods. [Formerly MUST 102] Development of performance skills and teaching methods for trumpet, french horn, trombone, euphonium, and tuba. Includes teaching techniques and problems relative to brass instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students or by permission of instructor. SPRING. [1] Clark.

MUED 1030. Strings Methods. [Formerly MUST 103] Development of performance skills and teaching methods for violin, viola, cello, and double bass. Includes teaching techniques and problems relative to string instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students or by permission of instructor. FALL. [1] Bingham.

MUED 1040. Percussion Methods. [Formerly MUST 104] Development of performance skills and teaching methods for snare drum, timpani, mallet instruments, and other percussion instruments. Includes teaching techniques and problems relative to all percussion instruments, care and minor repairs, and instructional materials. Open only to B.Mus. students or by permission of instructor. FALL. [1] Vinson.

MUED 1080. Piano Skills for the Music Educator. Focused study in score reading, sight reading, and collaborative techniques to prepare for classroom teaching. Includes vocal and instrumental repertoire. [1] Middleton.

MUED 2010. Introduction to Music Education. Focus on lesson planning, proper teaching sequences, observation techniques, classroom instruments, and verbal/non-verbal instruction. First in a sequence of three methods-based courses in teaching music. Open to all B.Mus. students. Sophomore standing required. [3] T. Biddlecombe.

MUED 2110. Seminar in Teaching Choral Literature. [Formerly MUST 211] Teaching techniques and knowledge of choral repertoire as applicable to K-12 choral programs. Tonal, harmonic, and melodic analysis, score marking and preparation, and classroom concerns. Repertoire drawn from the National American Choral Directors' Association reading lists, All-State honor choir lists, and other applicable sources to encompass a broad range of genres, styles, levels of difficulty, ethnicities, and musical periods. Prerequisite: MUTH 2200 and approval of instructor. SPRING. [2] M. Biddlecombe. (Offered alternate years.)

MUED 2120. Seminar in Teaching Orchestra. [Formerly MUST 212] Instructional strategies for string and full orchestras from the middle school through high school and youth orchestra levels. Topics to include rehearsal techniques, repertoire, materials, secondary string class instruction, and performance practices. Prerequisite: MUED 1030 and MCON 3000, or permission of instructor. SPRING. [2] (Offered alternate years.)

MUED 2130. Seminar in Orff/Kodály Methods. [Formerly MUST 213] Teaching general music with emphasis on Orff and Kodály principles and practices. Planning, instruction, and evaluation using techniques and materials from a variety of sources. FALL. [2] Ramsey. (Offered alternate years)

MUED 2140. Seminar in Teaching Jazz Styles. [Formerly MUST 214] Principles and practices for teaching instrumental jazz styles. Rehearsal techniques (including observation), repertoire, jazz education philosophies, and stylistic elements for soloists, combos, and larger ensembles. Prerequisite: MUSO 1220 or permission of instructor. SPRING. [2] Middagh.

MUED 2150. Seminar in Teaching Marching Band. [Formerly MUST 215] Techniques and materials for marching band instruction. Organization, administration, literature, technology, auxiliary groups. Planning, writing, arranging, and teaching halftime performances. Prerequisite or corequisite: MCON 3000 or permission of instructor. Corequisite: Participation in marching band. FALL. [2]

MUED 3010. Intermediate Instrumental Methods and Materials. Topics include applied teaching techniques, primary and early secondary band/orchestra literature, and lesson planning. Second in a sequence of three methods-based courses in teaching music. Prerequisite: MUED 2010. [2] Clark.

MUED 3020. Intermediate Choral Methods and Materials. Topics include rote teaching, primary and early secondary choral literature, vocal modeling, intermediate sequencing, and solfege implementation. Second in a sequence of three methods-based courses in teaching music. Prerequisite: MUED 2010. [2] Biddlecombe.

MUED 3870. Practicum in Music Teaching. [Formerly MUST 250A] Observation, participation, and supervised music teaching in a variety of school, grade level, and instructional music settings, designed to integrate and apply musical knowledge and teaching skills developed within the degree program. Weekly seminar included. SPRING. [1]

MUED 3871. Practicum in Music Teaching II. [Formerly MUST 250B] Observation, participation, and supervised music teaching in a variety

of school, grade level, and instructional music settings, designed to integrate and apply musical knowledge and teaching skills developed within the degree program. Weekly seminar included. Prerequisite: MUED 3870. SPRING. [1]

MUED 3872. Practicum in Music Teaching III. [Formerly MUST 250C] Observation, participation, and supervised music teaching in a variety of school, grade level, and instructional music settings, designed to integrate and apply musical knowledge and teaching skills developed within the degree program. Weekly seminar included. Prerequisite: MUED 3871 and any two from MUED 2110-2170. SPRING. [1]

MUED 3880. Experiential Instruction in Music I. Field-based experience with a precollege ensemble or university band organization. Experience will include classroom preparation, leading sectionals or portions of rehearsals, and/or other appropriate activities as assigned by the lead teacher. Attendance at culminating performance is required. [.5] T. Biddlecombe.

MUED 3881. Experiential Instruction in Music II. Field-based experience with a precollege ensemble or university band organization. Experience will include classroom preparation, leading sectionals, leading portions of rehearsals, and/or other appropriate activities as assigned by the lead teacher. [.5]

MUED 3882. Experiential Instruction in Music III. Field-based experience with a precollege ensemble or university band organization. Experience will include classroom preparation, leading sectionals or portions of rehearsals, and/or other appropriate activities as assigned by the lead teacher. Attendance at culminating performance is required. [1]

MUED 5000. Philosophical Foundations and Contemporary Issues in Music Teaching. [Formerly MUST 300] A comprehensive study of historical trends and philosophies relevant to music teaching. Readings and discussions of the practical application of educational research studies to music teaching. SUMMER. [3] Clark.

MUED 5010. Methods and Materials in Instrumental Music. [Formerly MUST 320] Techniques and materials for teaching instrumental music from elementary through senior high school. Emphasizes instrumental organization, administration, pedagogical practices, and developing school instrumental music programs. FALL. [3] Verrier.

MUED 5020. Methods and Materials in Vocal/Choral Music. [Formerly MUST 330] Techniques and materials for teaching vocal/choral music from elementary through senior high school. Emphasizes vocal music organization, administration, and pedagogical practices. FALL. [3] T. Biddlecombe.

MUED 5030. Methods and Materials in General Music, PreK through 12. [Formerly MUST 340] Techniques and materials for teaching general music, PreK through 12. Classroom organization, administration, pedagogical practices, and general musical activities such as Orff, Kodály, Dalcroze. FALL. [3] Alley.

MUED 5100. Advanced Studies for the Wind Band Conductor. [Formerly MUST 317] Knowledge of concert band repertoire as applicable to band programs from intermediate to advanced levels. Score preparation, rehearsal strategies, and expansion of conducting skills to include longer and more complex musical structures. Specific emphasis on developing historical and pedagogical context for repertoire evaluation and selection. Repertoire to encompass a broad range of genres, styles, and levels of difficulty. FALL. [2] Verrier.

MUKH: Keyboard Harmony

MUKH 1130. Introductory Keyboard Harmony. [Formerly MUSC 130] Introduction to repertoire, technique, transposition, harmonization, improvisation, and sight reading. Designed for B.Mus. and B.Mus.Arts students who have no piano background. Provides preparation for the Keyboard Harmony sequence. FALL. [1] Koutsoukos.

MUKH 1131. Keyboard Harmony I. [Formerly MUSC 131A] Development of basic technique, reading proficiency, elementary transposition. Diatonic harmony at the keyboard. Prerequisite: Placement test. Not

open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos.

MUKH 1132. Keyboard Harmony II. [Formerly MUSC 131B] Development of basic technique, reading proficiency, elementary transposition. Diatonic harmony at the keyboard. Prerequisite: placement test or MUKH 1131. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos.

MUKH 1133. Keyboard Harmony III. [Formerly MUSC 132A] Harmonization of melodies, improvisation of small musical forms, transposition in all keys with cadences and modulations, four-part score reading. Prerequisite: MUKH 1132. Strongly recommended: C- or above in 1132. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos.

MUKH 1134. Keyboard Harmony IV. [Formerly MUSC 132B] Harmonization of melodies, improvisation of small musical forms, transposition in all keys with cadences and modulations, four-part score reading. Prerequisite: MUKH 1133. Strongly recommended: C- or above in 1133. Not open to students who have completed MUKH 2133 or 2134. [1] Koutsoukos.

MUKH 2133. Accelerated Keyboard Harmony I. [Formerly MUSC 133A] Functional skills are reinforced with pedagogy, music theory, harmony, and ear training. Topics include improvisation, musical styles, and computer MIDI technology. For keyboard majors or by consent of instructor. Prerequisite: Placement test. Not open to students who have completed MUKH 1131-1132 or 1133-1134. FALL. [2] Krieger.

MUKH 2134. Accelerated Keyboard Harmony II. [Formerly MUSC 133B] Intensive study of materials presented in MUKH 2133. Prerequisite: 2133. Strongly recommended: C- or above in 2133. Not open to students who have completed 1133, 1134. SPRING. [2] Krieger.

MUSC: Musicianship

MUSC 2100. Musicianship Level I. [Formerly MUSC 170E] Examination of the sound properties of pitches, intervals and rhythms and their notation in real time. Focus is on diatonic scales and modes. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Corequisite: MUTH 2100. FALL. [1] McGuire, Williams.

MUSC 2200. Musicianship Level II. [Formerly MUSC 171E] Continuation of Musicianship Level I. Focus on the employment of pitches, intervals and rhythms in functional tonal contexts. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Prerequisite: MUSC 2100. Corequisite: MUTH 2200. SPRING. [1] McGuire, Williams.

MUSC 2300. Musicianship Level III. [Formerly MUSC 172E] Continuation of Musicianship II. Focus on tonal modulation and chromaticism. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Prerequisite: MUSC 2200. Corequisite: MUTH 2300. FALL. [1] McGuire.

MUSC 2400. Musicianship Level IV. [Formerly MUSC 173E] Continuation of Musicianship III. Focus on the employment of pitches, intervals and rhythms in non-tonal contexts. Lectures, discussion, real-time listening experiences, dictation, sight-singing, score reading, and improvisation are integrated throughout the course. Prerequisite: MUSC 2300. Corequisite: MUTH 2400. SPRING. [1] McGuire.

MUSC 3105. Advanced Musicianship V. [Formerly MUSC 271E] Further development of aural skills, including techniques for hearing, singing, reading, and writing tonal and atonal music in real time. Prerequisite: MUSC 2400. FALL. [1] Ploger.

MUSC 3106. Advanced Musicianship VI. [Formerly MUSC 272E] Further development of aural skills, including techniques for hearing, singing, reading, and writing tonal and atonal music in real time. Prerequisite: MUSC 3105. SPRING. [1] Ploger.

MUSC 3107. Advanced Musicianship VII. [Formerly MUSC 273E] A continuation of techniques studied in MUSC 3106. Hearing in tonal

and atonal music, including extended harmonic and melodic structures, complex rhythmic elements, and score reading. Discussion of pedagogical approaches to teaching aural studies. Prerequisite: MUSC 3106. FALL. [1] Ploger

MUSC 3108. Advanced Musicianship VIII. [Formerly MUSC 274E] A continuation of techniques studied in MUSC 3107. Hearing in tonal and atonal music, including extended harmonic and melodic structures, complex rhythmic elements, and score reading. Discussion of pedagogical approaches to teaching aural studies. Prerequisite: MUSC 3107. SPRING. [1] Ploger

MUSC 5110. Intensive Musicianship I. [Formerly MUSC 341A] Intensive immersive musical instruction modeled on language acquisition process, designed to provide musicians with practical skills in real-time aural processing, including interval identification, reading and notating pitch and rhythm, facility in each of the diatonic modes, aural tracking of multiple simultaneous parts. Open by instructor approval. SUMMER. [1] Ploger.

MUSC 5120. Intensive Musicianship II. [Formerly MUSC 341B] Intensive immersive musical instruction modeled on language acquisition process, designed to provide musicians with practical skills in real-time aural processing, including interval identification, reading and notating pitch and rhythm, facility in each of the diatonic modes, aural tracking of multiple simultaneous parts. Open by instructor approval. SUMMER. [1] Ploger.

MUSC 5130. Intensive Musicianship III. [Formerly MUSC 342] Continuation of materials covered in Intensive Musicianship MUSC 5110 and 5120, including further real-time aural processing, with discussion of pedagogical approaches to teaching musicianship using a language-acquisition model. Prerequisite: MUSC 5120. SUMMER. [1] Ploger.

MUSE: Ensembles

All MUSE courses are repeatable. Students may accrue up to 6 credit hours per semester of enrollment.

MUSE 1010. Instrumental Ensembles. [Formerly MUSE 101] Open by audition to all Vanderbilt students. Musicians participate in orchestra, wind ensembles, and/or a variety of smaller ensembles on a rotational basis through the course of the semester. Performances include symphonic repertoire from the classical and romantic periods as well as standard and new repertoire from baroque to contemporary. At least three formal concerts are presented each semester. [1] Fountain, Verrier.

MUSE 1020. Vanderbilt Symphonic Choir. [Formerly MUSE 101A] Open by audition to all members of the Vanderbilt community, this choral ensemble performs literature requiring large forces, such as masses and oratorios. At least one formal concert each semester and at least one work each year with the Vanderbilt Orchestra. [1] T. Biddlecombe.

MUSE 1030. Vanderbilt Opera Theatre. [Formerly MUSE 101F] Open by audition to all Vanderbilt students. Performance material chosen from all forms of lyric theatre: Standard operatic repertoire, operetta, and American musical theatre. At least one production is presented. FALL. [1] Shay.

MUSE 1200. Steel Drum/Pan Ensemble. [Formerly MUSE 150A] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on Caribbean steel drums/pans with emphasis on the music and dance repertoires of the island of Trinidad. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. No previous experience required. [1] Britain.

MUSE 1210. Steel Drum/Pan Ensemble. [Formerly MUSE 150B] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on Caribbean steel drums/pans with emphasis on the music and dance repertoires of the island of Trinidad. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. Ability to read musical notation required. [1] Britain.

MUSE 1220. Steel Drum/Pan Ensemble. [Formerly MUSE 150C] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on Caribbean steel drums/pans with emphasis on the music and dance repertoires of the island of Trinidad. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. Ability to read musical notation required. Prerequisite: MUSE 1200 or 1210. [1] Britain.

MUSE 1230. African Performing Ensemble. [Formerly MUSE 171] Open to all members of the Vanderbilt community, this course provides a laboratory and performance experience drawing on traditional African musical instruments (drums, percussion, winds) with an emphasis on West African (Ghana) and East African (Uganda) music and dance repertoires. Lecture-demonstrations and rehearsals in one weekly two-hour session. At least one public performance each semester. No previous experience required. [1] Ahima.

MUSE 1310. Jazz Ensemble: Big Band. [Formerly MUSE 131] Open by audition to all Vanderbilt students, this ensemble performs both traditional and modern jazz styles, including dance band, swing, contemporary, and charts currently under development. Improvisation, jazz timbres, and other idiomatic concepts explored through lecture-demonstration and performance. At least one concert is presented each semester. [1] Middagh.

MUSE 1320. Jazz Ensemble: Small Combo. [Formerly MUSE 132] Open by audition to all Vanderbilt students. Provides focused laboratory training for performance of composed and improvised small combo jazz traditions. Discussion and application of techniques associated with solo, sectional, and ensemble performance in jazz. At least one concert is presented each semester. [1] Coffin, Middagh, Spencer.

MUSE 1330. Blair Jazz Choir. Open by audition to all Vanderbilt students; ensemble is limited to 12 voices, plus rhythm section. Repertoire includes scat, contemporary, and standard jazz. On- and off-campus performances throughout the semester. [1] Watson Utterstrom.

MUSE 2120. Vanderbilt Chorale. [Formerly MUSE 201A] Open by audition to all Vanderbilt students, this select 36-40 voice choral ensemble performs music in a variety of styles. At least two formal concerts each semester. [1] T. Biddlecombe.

MUSE 2210. Instrumental Chamber Music. [Formerly MUSE 221] Open to all Vanderbilt students by audition or upon recommendation of the private instructor. Size of ensembles may vary. One hour weekly coaching. Two hours of additional rehearsal each week. [Variable credit: ½, 1, or 2 each semester] Performance faculty.

MUSE 2220. Chamber Music: Percussion. [Formerly MUSE 215] Open to percussion majors and minors. Size of ensembles will vary. One hour weekly coaching and two hours of additional rehearsal (independent of coaching) expected each week. [½ or 1] Jung.

MUSE 2230. Chamber Music: Sonata Class for Strings and Piano. [Formerly MUSE 223] One hour weekly class for performance and study of string (violin, viola, cello, bass) and piano sonatas from the standard repertoire, baroque through modern, with each sonata duo receiving thirty minutes of coaching within the class time. Performance of complete sonata during the last class of the semester. Two hours of additional rehearsal each week. Open by consent of instructor. [1] Dorfman, Plummer.

MUSE 2240. Chamber Music: String Quartet. [Formerly MUSE 224] Open by consent of instructor. One hour of coaching and at least two hours of additional rehearsal each week. [Variable credit: ½, 1, or 2 each semester] Kochanowski.

MUSE 2270. Baroque Chamber Music. Open to all Vanderbilt students with experience on baroque instruments or upon recommendation of the private instructor. Size of ensembles may vary. Students will receive one hour of coaching and are expected to rehearse at least two additional hours each week.

MUSE 2300. Collaborative Techniques for Pianists. [Formerly MUSE 102] Basic techniques of vocal and instrumental collaboration. Orchestral

reductions, continuo realization, modern editions of early music, musical terms, diction, and ensemble techniques. Performance of vocal and instrumental repertoire. Both group and individual coaching. Open only to B.Mus. and B.Mus.Arts piano majors in fall; by consent of instructor in spring. [1] Melissa Rose.

MUSE 2310. Collaborative Piano: Instrumental. [Formerly MUSE 222] Introduces pianists to collaboration with instrumentalists. Weekly coaching with piano instructor and 5 hours practice/rehearsal per week. Standard instrumental repertoire will be assigned. Open by consent of instructor. [Variable credit: ½, 1, or 2 each semester] Dorfman, Nies, Melissa Rose.

MUSE 2320. Collaborative Piano: Vocal. [Formerly MUSE 201B] Introduces pianists to collaboration with singers. Weekly coaching with piano instructor and 5 hours practice/rehearsal per week. Focus on standard art song and opera repertoire. Open by consent of instructor. [Variable credit: 1-2 each semester] Dorfman, Nies, Melissa Rose.

MUSE 2330. Vocal Chamber Music. [Formerly MUSE 201D] Open by consent of the instructor. One hour weekly coaching for vocal/instrumental duos or ensembles, including singer/piano duos. Two hours of additional rehearsal each week. [Variable credit: ½, 1, or 2 each semester] Dorfman, Melissa Rose.

MUSL: Musicology/Ethnomusicology

MUSL 1100. World Music. [Formerly MUSL 160] World music as a cultural product; selected musics of Africa, Native America, India, Indonesia, and African America. Topics include music and religion, popular music, field work methodology, and gender issues. Not open to students who have completed MUSL 2100. FALL. [3] Fry.

MUSL 1105. African Music. [Formerly MUSL 171] A survey of selected traditional and popular music of Africa. Historical, social, and cultural contexts; listening; some performances in class. SPRING. [3]

MUSL 1111. First-Year Writing Seminar. [Formerly MUSL 115F] Independent learning and inquiry in an environment in which students can express knowledge and defend opinions through class discussion, oral presentations, and written expression. Topics vary. Open to freshmen only. FALL. [3] Musicology and Ethnomusicology faculty.

MUSL 1200. Introduction to Music Literature. [Formerly MUSL 140] An introduction to the literature of music from 600 C.E. to the present through a study of selected works. Extensive listening is required. Not open to students who have completed MUSL 2200W. Does not count toward a major in music. FALL, SPRING. [3] Platt.

MUSL 1210. The Concerto. [Formerly MUSL 143] A close study of representative works, from the baroque invention of the concerto principle up to modernist and contemporary adaptations. Focus on structural listening. No previous training in music required. FALL. [3] Michael Rose. (Offered alternate years)

MUSL 1220. The Symphony. [Formerly MUSL 144] Orchestral literature with emphasis on the evolution of symphonic form and style, through the study of selected masterworks of the standard repertoire. FALL. [3] Hime, Michael Rose.

MUSL 1230. Survey of Choral Music. [Formerly MUSL 145] Choral literature, sacred and secular, from the Renaissance to the present, with emphasis on a study of selected masterworks from each period. SPRING. [3] Hime.

MUSL 1300. Music, the Arts, and Ideas. [Formerly MUSL 183] The changing historical relationships among music, literature, fine arts, and philosophy. Musical developments as responses to social, political, and economic circumstances. FALL. [3] Link.

MUSL 1310. Love and Death in Music. [Formerly MUSL 184] Perspectives on two great problems of human life throughout the history of Western music. Themes include idealized love, sexual pathology, love and realism, love of God, confronting death, transcending death. Connections of music to visual arts, literature, film. No musical background required. [3] Michael Rose. (Offered alternate years)

MUSL 1320. The Music of the Outliers. Seminar centering on the music of composers who were/are unorthodox in their thinking, who resisted prescribed notions of what music is and challenged the world around them to think about sound in new ways. Topics include the "reactionary" climate of the twentieth century, modernism and post-modernism, electronics in music, minimalism and microtonalism, performance art and "Art-Pop." Not open to students who have completed MUTH 2400. Does not count toward a major in music. No prior experience in music necessary. Maymester. [3] Slayton.

MUSL 1330. Cross-Currents in Music and Art. Survey of selected pairings or groupings of artists and composers through four centuries of art and music in Europe and the United States. [3] Michael Rose.

MUSL 1600. American Popular Music. [Formerly MUSL 149] Historical study of ways the culture of a nation is reflected and sometimes shaped by the chosen musics of the groups composing the American "salad bowl." Topics include audience reception, production and consumption, multiculturalism, and meaning. SPRING. [3] Gunderman.

MUSL 1610. Musical Theatre in America: A Cultural History. [Formerly MUSL 103] From eighteenth century melodrama and vaudeville through the musicals of the 1940s and 1950s to the contemporary emphasis on integration of spectacle, dance, and other theatrical arts. Readings, live productions, guest lecturers, and film. SPRING. [3] Lovensheimer. (Offered alternate years.)

MUSL 1620. Survey of Jazz. [Formerly MUSL 148] A survey of jazz history, with particular attention to the major composers, "Jelly Roll" Morton, Duke Ellington, and Thelonius Monk, who gave the music synthesis and form; and to its major innovative soloists, Louis Armstrong, Charlie Parker, and Ornette Coleman, who renewed its musical language. FALL, SPRING. [3] Fry.

MUSL 1630. The Blues. [Formerly MUSL 151] Downhome, classic, Chicago, and urban blues history, musical structure, musical styles, singers' lives, and meanings of blues lyrics. The current blues revival, blues and tourism, race and revisionist blues scholarship, and the relation of blues to African American poetry and fiction. Artists such as Ma Rainey, Charley Patton, Robert Johnson, Lightnin' Hopkins, Muddy Waters, B.B. King, Buddy Guy, Robert Cray. SPRING. [3] Fry.

MUSL 1640. Country Music. [Formerly MUSL 152] A musical and cultural survey of the talents, traditions, and trends of country music from its colonial roots to its current status as a multi-million dollar global industry. Focus on the music, creators, and performers of that music and its cultural and social contexts. FALL, SPRING. [3] Cooper.

MUSL 1650. History of Rock Music. [Formerly MUSL 153] History and development of rock and roll music and its performance from the 1950s to the present. Major artists from each decade, subgenres (rockabilly, R&B, folk, soul, metal, pop, alternative, etc.), and technological, cultural, and economic developments that helped shape the music. FALL, SPRING. [3] Gunderman.

MUSL 1660. Music and Tourism: Music City Museum and Memorabilia. [Formerly MUSL 265] An exploration of the intersection between popular music and tourism. Music landmarks as tourist attractions, music memorabilia and museums, tourism and urban development, souvenirs as travel credentials, and tourism and issues of representation. FALL. [3] Fry.

MUSL 1670. Survey of American Hip-Hop. This course examines the history of hip-hop and culture from the 1970s to the present, including current debates and discussions. It explores the dynamics of hip-hop culture regarding its historical development, political influence and social impact, particularly in American culture. This class also explores relevant issues surrounding race, gender, cultural relations, economics and social barriers relating to hip-hop music and culture. Discussions will include the coexistence of various hip-hop styles and the exploitation of this music and culture as a commodity for national and global consumption. [3] Chase.

MUSL 2100. Music as Global Culture. [Formerly MUSL 122] Music and musical cultures from around the world. Students will approach indigenous music theories on their own terms in order to understand

and complement the complexities of contemporary Western Music performance styles and expectations. Emphasis on fundamental elements (e.g., rhythm, pitch, harmony, and form) of diverse musical practices. Transcription, notation, and analysis of a variety of melodic and rhythmic forms. Not open to students who have completed MUSL 1100. Prerequisite: Open to B.Mus. and B.Mus.Arts students, declared second majors, or with demonstrated musical literacy and permission of instructor. FALL. [3] Fry.

MUSL 2110. Music in Latin America and the Caribbean. [Formerly MUSL 250] An introduction to a wide variety of musical genres and traditions in Latin America and the Caribbean. Indigenous, folk, popular, and art music forms and their social function, meaning, historical development, cultural blending, and cross-hybridization. SPRING. [3]

MUSL 2150. Music, Identity, and Diversity. [Formerly MUSL 261] Issues of multiculturalism and intersections with musical expression in America. Cultural determinants, such as race, gender, ethnicity, class, religion, language, ideology, folklore, and history will be studied critically. Prerequisite: Any MUSL course or AMER 1002. FALL. [3]

MUSL 2200W. Music in Western Culture. [Formerly MUSL 121W] An overview of music in the Western art tradition, including its basic historical periods, styles, genres and disciplines. Tangible applications of historical, analytical, and cultural thinking to musical performance. Guided discussion, varied writing assignments, and presentations. Prerequisite: Open to B.Mus. and B.Mus.Arts students, declared music minors/second majors, or with demonstrated musical literacy and permission of instructor. SPRING. [3] Musicology faculty.

MUSL 2310. The Bible and Music. [Formerly MUSL 219] An investigation of Biblical texts (Old Testament/Tanach; Deuterocanonical texts/Old Testament Apocrypha; New Testament) that have inspired musical settings and the musical settings themselves. Emphasis on literary and musical analysis and interpretation. No musical or scriptural background assumed. FALL. [3] Rose and Levine.

MUSL 2320. Exploring the Film Soundtrack. [Formerly MUSL 264] Relationships among soundtrack, image, and narrative in film. The complex of music, sound, and dialog in a variety of American films, from silents to Hollywood blockbusters and cartoons. Topics include diegesis, temporality, continuity, and musical style. Discussion, video, and film research, reading, and listening. No musical background required. SPRING. [3] Link.

MUSL 2330. Words and Music. [Formerly MUSL 218] An investigation of works of literature that have inspired musical settings and the musical settings themselves. Emphasis on literary and musical analysis and interpretation. No musical background assumed. Repeat credit for students who have completed ENGL 3736. SPRING. [3] Michael Rose and Mark Jarman, Professor of English.

MUSL 2340. Music in Narrative Fiction. Exploration of music as an explicit narrative presence in fiction of the twentieth and twenty-first centuries. Examination of the roles of music as plot device, symbol, setting, and character development as embodied in various genres including popular, classical, and jazz. Analysis of complete novels and short fiction combined with the theoretical, social, and historical analysis of music, with synthesis in creative responses. [3]

MUSL 2350. The Music and Culture of Venice. A survey of the music, history, art, architecture, and environmental development of a city that has been central to the Western imagination for over a thousand years. Prerequisite: MUSL 1200 or permission of the instructor. [3] Platt

MUSL 2600. American Music. [Formerly MUSL 147] A history of music in the United States, 1620 to the present. Distinctly American musical traditions such as shape-notes, minstrelsy, jazz, twentieth-century syntheses. Recommended: MUSL 2200W or 1200, or music-reading skills sufficient to follow a score. FALL. [3] Lovensheimer.

MUSL 2610. Music of the South. [Formerly MUSL 262] The musical riches of the American South approached from various perspectives, including the historical, cultural, social, political, and religious. Blues, country, and gospel are the primary genres of study; jazz, folk, and

classical traditions in the South also receive attention. Prerequisite: Any MUSL course or AMER 1002. FALL. [3] Fry. (Offered alternate years)

MUSL 2620. DIY Movements: Hip-Hop, Punk, and the Democratization of America's Pop. An exploration of the history, continuation, and aesthetics of the DIY music movement in the United States and abroad. A historical approach will be used, with an emphasis on important styles, artists, and social and cultural issues. Students will gain an understanding of hip-hop and punk as musical and performative forms, how they are created, how they are interpreted, and how they are a direct expression of the cultural context in which they are produced. Prerequisite: Any MUSL course. [3] Fry.

MUSL 3100. Music of the 20th and 21st Centuries. [Formerly MUSL 239] An exploration of the wealth and diversity of European and American art music since 1900. Emphasis on the historical, cultural, philosophical, and technological contexts that encourage an approach to this music on its own terms. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2200W and 2100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Calico, Lovensheimer.

MUSL 3150. Music, Gender, and Sexuality. [Formerly MUSL 201] Exploration of gender and sexuality in Western art and vernacular musical traditions. Topics include gendered musical forms, genres, and performance; feminist music criticism; ideologies of musical authorship and genius; musical canons; and musical representations of gender and sexuality. Prerequisite: MUSL 2200W or 1200 and ability to read a score. SPRING. [3] Lowe. (Offered alternate years)

MUSL 3155. Women and Music. [Formerly MUSL 200.] An investigation of the roles women have played in the development of Western music—performance, composition, patronage, education—and the social and economic factors that have influenced their position. Recommended: MUSL 2200W, 1200, or familiarity with the style periods of classical Western music. [3] Cyrus. (Offered alternate years)

MUSL 3160. Women and Rock Music. [Formerly MUSL 253] An exploration of the ways that women have made their voices heard in rock on stage, in the studio, behind the scenes, and as fans. Prerequisite: Any MUSL or WGS course. SPRING. [3] Gunderman.

MUSL 3213. Artist, Community, and Democracy. Communities of diverse artists, minority viewpoints, and cultural pluralism in a democratic society. Contemporary United States with cross-cultural and historical comparisons. [3]

MUSL 3220. Opera in the 17th and 18th Centuries. [Formerly MUSL 221A] In-depth study of five or six representative works. Score and libretto analysis, reception history, cult of the performer, role of the contemporary producer-director. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Calico.

MUSL 3221. Opera in the 19th Century. [Formerly MUSL 221B] In-depth study of five or six representative works. Score and libretto analysis, reception history, cult of the performer, role of the contemporary producer-director. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. SPRING. [3] Calico.

MUSL 3222. Mahler Symphonies: Songs of Irony. [Formerly MUSL 222] An exploration of large orchestral works of Gustav Mahler emphasizing their demonstration of the synthesis of symphony and song and their reflection of nineteenth-century German philosophies of irony. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. SPRING. [3] Lovensheimer.

MUSL 3223. Music in the Age of Beethoven and Schubert. [Formerly MUSL 223] The musical legacy of each composer in culture and (especially) social context: patrons, family, and friends. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Cyrus, Lowe, Shadle.

MUSL 3224. Haydn and Mozart. [Formerly MUSL 224] An in-depth look at the music of Haydn and Mozart in cultural and social contexts. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Lowe.

MUSL 3225. Brahms and the Anxiety of Influence. [Formerly MUSL 225] A study of Brahms' large-scale orchestral works and other selected literature from the perspective of "influence." Musical relationships to Couperin, J. S. Bach and sons, Beethoven, Wagner, Schoenberg and others. Topics include Brahms' self-image; Brahms as conductor, performer, and editor; stylistic fingerprints; popular and folk elements; Brahms and later composers; his relationship to Clara; the Wagner-Brahms debate. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 2100; or permission of instructor. FALL. [3] Cyrus. (Offered alternate years)

MUSL 3226. The String Quartet. [Formerly MUSL 226] An intensive exploration of the string quartet. Topics for discussion include origins and history of the genre, rhetoric, audience, reception, interpretation, and performance practice. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. SPRING. [3] Lowe.

MUSL 3227. Music in the Age of Revolution, 1789-1848. [Formerly MUSL 227] Explores developments in genres, styles, patronage, and careers brought on by socioeconomic and political change from late Haydn to Wagner. Topics include nationalism, Romanticism, rise of the middle class, touring virtuoso, composer/critic. Musical analysis, historical and cultural context. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. FALL. [3] Calico, Shadle.

MUSL 3228. J. S. Bach: Learned Musician and Virtual Traveler. [Formerly MUSL 228] Explores the life and works of high baroque composer J. S. Bach, who developed a highly cosmopolitan, erudite musical style. Course will include structural and stylistic analysis and will also address biography, cultural context, and performance practice. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. SPRING. [3] Lowe.

MUSL 3229. Robert Schumann and the Romantic Sensibility. [Formerly MUSL 229] An exploration of Robert Schumann's music and criticism within the context of German romanticism. B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. SPRING. [3] Lovensheimer.

MUSL 3230. Music and the Construction of National Identity. [Formerly MUSL 230] An in-depth exploration of the tools used to construct national musical identities during the long nineteenth century (ca. 1789-1914), including compositional style, performance techniques, and music criticism. Addresses topics from Western Europe, Eastern Europe, and the Americas. Prerequisite: B.Mus. and B.Mus.Arts students and second majors: MUSL 2100, 2200W, and 3100; music minors: MUSL 1200 or 2200W; or permission of instructor. SPRING. [3] Shadle.

MUSL 3231. The Art of Program Music: Tone Painting and Symphonic Poetry. An in-depth exploration of the style, philosophical basis, and possible meanings of program music, broadly defined. Examples will be taken from the sixteenth century to the present with a focus on the long nineteenth century (1789-1914). Prerequisite: B.Mus. and B.Mus.Arts students and second majors: MUSL 2200W, 2100, and 3100; music minors: MUSL 2200W or 1200; or permission of instructor. [3]

MUSL 3232. God, Sex, and Politics in Early Music. An exploration of the intersecting topics of religious practice, love and sexuality, and power structures in early music. Students will gain familiarity with many of the major currents, cultures, composers, and contexts of Western European music from ca. 1100 to 1650 C.E. In addition to the primary themes of the course, we will entertain such other musically

relevant topics as mathematics, early music theory, mysticism, the role of women in early music, the development of notation, and questions of performance and interpretation. Prerequisite: B.Mus. and B.Mus.Arts students and second majors, MUSL 2100, 2200W, and 3100; music minors, MUSL 2200W or 1200; or permission of instructor. [3] Lowe.

MUSL 3850. Independent Study. [Formerly MUSL 289] Development and execution of a program of study in musicology or ethnomusicology under the direction of a member of the department. (See Academic Regulations section.) May be repeated for credit. [Variable credit: 1-3] Musicology faculty.

MUSL 3890. Selected Topics in Music History. [Formerly MUSL 294] Selected methodological approaches focused on a particular topic. Offerings have included "Music and the American Presidency," "Schoenberg and the Word," "Mingus, Monk, and Miles: Jazz Biography and Jazz Composition," "Stephen Sondheim and the American Musical," and "Mozart Piano Concertos." Prerequisite: Varies by topic. May be repeated for credit when topics vary. [3] Musicology faculty.

MUSL 4978. Senior Thesis. [Formerly MUSL 298] Completion of an extended paper based in musicological or ethnomusicological research under the supervision of a faculty sponsor. Progress monitored via tutorials. Open only to seniors. Prerequisite: MUSL 3100. May be repeated once. [Variable credit: 1-3 hours each semester] Musicology faculty.

MUSL 4998. Senior Honors Thesis. [Formerly MUSL 299A] Independent research on a musicological or ethnomusicological topic, culminating in a written thesis submitted to the faculty. Progress monitored via tutorials. Students completing this course with distinction, including a thesis and an oral defense, will earn honors or highest honors in music literature and history. Open only to students in the department honors program. Prerequisite: Departmental approval of formal prospectus. [3] Musicology faculty.

MUSL 4999. Senior Honors Thesis. [Formerly MUSL 299B] Independent research on a musicological or ethnomusicological topic, culminating in a written thesis submitted to the faculty. Progress monitored via tutorials. Students completing this course with distinction, including a thesis and an oral defense, will earn honors or highest honors in music literature and history. Open only to students in the department honors program. Prerequisite: Departmental approval of formal prospectus. [3] Musicology faculty.

MUSO: Other Music Courses

MUSO 1000. Recital Attendance. [Formerly MUSO 108] Weekly recitals in solo and chamber music settings, presented by students enrolled for performance instruction, and six additional faculty/student recitals and concerts. Required of all music degree (B.Mus.) students. (See Academic Regulations section of this catalog.) Offered on a pass/fail basis. [0] Melissa Rose.

MUSO 1001. Commons iSeminar. [Formerly MUSO 099] Open to first-year students of all four undergraduate schools. Topics approved by Blair faculty. Students may propose topics through the associate dean. No credit toward a major or minor in music. General Elective credit only. FALL, SPRING. [1] Staff.

MUSO 1130. Percussion Seminar. [Formerly MUSO 153] Overview of percussion in Western and non-Western cultures from pre-history to present. Emphasis on European/American orchestral practices. Representative works for study chosen from symphony, opera, oratorio, and other orchestral/choral sources. FALL. [1] Jung.

MUSO 1201. Lyric Theatre Workshop I. [Formerly MUSO 104A] Introduction to the various performance elements of the lyric theatre experience: acting, movement, improvisation, use of the voice, stage combat, and scene study. Open to all Vanderbilt students by consent of instructor. SPRING. [1] Shay.

MUSO 1202. Lyric Theatre Workshop II. [Formerly MUSO 104B] Various performance elements of the lyric theatre experience: acting,

movement, improvisation, use of the voice, stage combat, and scene study. Prerequisite: MUSO 1201. SPRING. [1] Shay.

MUSO 1203. Lyric Theatre Workshop for Instrumentalists. [Formerly MUSO 104C] Beginning acting and movement techniques for the lyric stage as they pertain to instrumental musicians. Memorized texts, acting improvisation, and stage movement are explored to gain better connection to the music, fellow collaborators, and the audience. Application to individual instrumental repertoire required. Open by consent of instructor. SPRING. [1] Shay.

MUSO 1210. Baroque Performance for Strings. [Formerly MUSO 117] Aspects of period instrument performance adaptable to modern instruments and modern bows. Articulation, ornamentation, the rule of the down-bow, the influence of dance, and other technical and stylistic issues. Baroque bow provided. Culminates in a lecture-performance. May be repeated for credit. [1] (Not currently offered.)

MUSO 1220. Jazz Improvisation I: The Blues. [Formerly MUSO 131] Introduction to the techniques of jazz improvisation. Development of basic performing technique with in-depth study of the blues form and its variations. [1]

MUSO 1221. Jazz improvisation II: The Great American Songbook. Intermediate study techniques for jazz improvisation. In-depth study of rhythm changes, the Great American Songbook, and jazz standards. Introduction to re-harmonization techniques. Prerequisite: MUSO 1220. [1]

MUSO 1222. Jazz Improvisation III: Post-bop and Beyond. Advanced study in techniques for jazz improvisation. In-depth study of contemporary jazz compositions, structured- and free-forms, and original student compositions. Prerequisite: MUSO 1220 and MUSO 1221. [1]

MUSO 1230. Advanced Lyric Writing for Songwriters. Designed to help students find their unique voice as lyricists through lecture, reading, exercises, discussion, and lyric analysis. Designed for songwriters with experience in song form, rhyme and rhyme scheme, and lyrical rhythm. Does not count toward a major or minor in music. Prerequisite: MUTH 1125, or permission of instructor. [1] Blackmon.

MUSO 1302. History of Classical Recording. A survey of the five main periods—acoustic, electric, LP, stereo and digital—of recorded classical music. Students will listen to the recordings of such legendary artists as Caruso, Paderewski, Kreisler, Toscanini, and Callas. The profound impact of recording technology on performance practice itself will also be thoroughly considered. [3] Pitcher.

MUSO 1340. Technology for Musicians. An introduction to music-related computer technology essential to the contemporary musician, including the basic principles of MIDI and computer music notation. [1] Salazar.

MUSO 1342. Fundamentals of Digital Audio. An introduction to the fundamental concepts of using a digital audio workstation, including sequencing MIDI, recording and editing audio, and mixing full songs. Prerequisite: Demonstrated musical literacy and permission of instructor. [1] Salazar.

MUSO 1344. Digital Sound Synthesis. An introduction to audio synthesis via software, including manipulation of basic waveforms/samples, leading to the creation of instruments and musical projects on the computer. [2] Salazar.

MUSO 1346. Mixing. A hands-on approach to mixing using a digital audio workstation. Topics covered include the use of audio processing tools such as equalization, compression, reverb, etc. and techniques used to create a natural-sounding mix. Prerequisite: MUSO 1342 or instructor consent. [1] SPRING. Salazar.

MUSO 1350. Computer Recording Technology Seminar. [Formerly MUSO 102] The digital recording revolution. Recording, editing, and mixing music, using both audio and MIDI sequencing data inside the computer. Remixing techniques with universal plug-in software. Sampling, synthesis, and dissection of studio projects. [2]

MUSO 1400. Diction for Singers: English and Italian. [Formerly MUSO 159] An introduction to the International Phonetic Alphabet as applied to Lyric English and Italian diction. FALL. [1] Montgomery.

MUSO 1410. Diction for Singers: German. [Formerly MUSO 159C] High German diction, using the International Phonetic Alphabet. Prerequisite: 1400 or permission of the instructor. SPRING. [1] Montgomery.

MUSO 1420. Diction for Singers: French. [Formerly MUSO 159D] French stage diction, using the International Phonetic Alphabet. Prerequisite: 1400 or permission of the instructor. FALL. [1] Montgomery.

MUSO 1501. Community Music Partnerships: Fundamentals and Applications I. Development of practical skills for music-making in a variety of community service contexts. Interactive setting with a focus on skills of collaboration and communication, both as artists and with a community partner. Culminates in small case-study group performance projects. [1] Shay.

MUSO 1502. Community Music Partnerships: Fundamentals and Applications II. Application of essential skills of programming, audience development, marketing, and collaboration, through a mentored, project-based experience with a community partner in Metro Nashville. Culminates in a public performance in collaboration with the community partner. Prerequisite: MUSO 1501. [1] Shay.

MUSO 2100. Music Criticism and Writing. [Formerly MUSO 200] A practical guide to writing professional music criticism. Readings include selected writings of the great critics, literary authors, program annotators and bloggers. Assignments involve listening exercises, written reviews, and program notes. Difference in style among classical, jazz, and rock critics will be considered. Prerequisite: MUSL 2200W and MUSL 2100, or permission of instructor. FALL. [2] Pitcher.

MUSO 2200. The Movement of Line. By examining in detail inter-related examples from calligraphy, drawing, verse, and music, this course seeks to discover common elements of concept and construction in diverse forms of linear movement. Sophomore standing and an ability to read a single line of music required. [3] Smith.

MUSO 3000. Collaborative Composition in London. [Formerly MUSO 230] Exchange program with the Royal Academy of Music, London. Collaborative workshop between student composers and performers at both schools, with faculty mentorship. Travel to London over spring break (vouchers available). Enrollment by audition. SPRING. [1] (Offered alternate years)

MUSO 3010. Performance in Practice, IES Vienna. [Formerly MUSO 231] Open by audition to students in the IES Vienna program. The workshop is designed to offer vocalists and instrumentalists the opportunity to expand repertoire and enhance performance skills. Rehearsal and discussion of aspects of selected works in relation to the challenge of performance. May be repeated once for credit. [2] Staff.

MUSO 3100. Music and Cognition. Theories and research about the cognition of music, appreciation, and performance. Selected musical topics include timbre, consonance, dissonance, tuning, melody, rhythm, scales, modes, chords, and composition. Concepts and research from the psychological sciences emphasize sensory mechanisms, perceptual discriminations, pattern recognition, categorization, transfer of learning, and motor coordination. Prerequisite: One course in music or psychology. [3] Bingham.

MUSO 3850. Independent Study. [Formerly MUSO 289] Development of a project or a program of reading under the direction of a faculty sponsor. Consent of the faculty sponsor is required. (See Academic Regulations section.) May be repeated for credit. [Variable credit up to 3 hours per semester] Staff.

MUSO 3970. Junior Recital. [Formerly MUSR 295] Students are encouraged to prepare a joint recital, shared with another degree candidate. See Blair Academic Regulations section of the *Undergraduate Catalog* for detailed requirements. Open by permission of instructor. [1]

MUSO 4970. Senior Recital. [Formerly MUSR 299] See Blair Academic Regulations section of the *Undergraduate Catalog* for detailed requirements. Open by permission of instructor. [1]

MUSO 4972. Jazz Concentration Recital. See Blair Academic regulations section of the *Undergraduate Catalog* for detailed requirements. Open by permission of instructor. [1]

MUTH: Music Theory

MUTH 1120. Songwriting and Elements of Music Theory. [Formerly MUSC 100] Introduction to fundamental elements of music as they apply to popular songwriting techniques. Selected readings on the technical and aesthetic facets of songwriting. Listening analysis and discussion of songs in a variety of current styles. Selected aural skills as they relate to the songwriter's craft. Class visits by successful songwriters. Designed for students with little or no technical training in music. Does not count toward a major or minor in music. FALL, SPRING. [3] Walker.

MUTH 1125. Songwriting II. [Formerly MUSC 102] Project-based class designed to refine and advance skills developed in MUTH 1120. Focuses on effective musical and lyrical thematic treatment. Extensive study of rewriting techniques; frequent performances of student compositions. Selected readings on the technical and aesthetic facets of songwriting. Listening, analysis, and discussion of songs in a variety of current styles. Occasional Monday night sessions with guest songwriters and experts in the field. Does not count toward a major or minor in music. May be repeated once for credit. Prerequisite: MUTH 1120. FALL, SPRING. [3] Walker.

MUTH 1130. Nashville Number System for Songwriters/Performers. [Formerly MUSC 104] Designed for songwriters and practitioners who may not read traditional music. Introduction to intervals, major and minor scales, chords and chord extensions, inversions, time signatures, note values, the Nashville Number System, song forms, charting original songs and classic hits. Includes observation and discussion of studio work. Does not count toward major or minor in music. FALL. [1] Blackmon.

MUTH 1200. Survey of Music Theory. [Formerly MUSC 120A] Presents eighteenth- to twentieth-century harmonic practice. Designed to develop music theory skills through written exercises of figured and unfigured basses, harmonization of melodies, and study of ear training, using sight-singing exercises and melodic and harmonic dictation. Not open to students who have completed MUTH 2100 or 2200. Does not count toward a major in music. [3] Bingham.

MUTH 1210. Survey of Music Theory. [Formerly MUSC 120B] Presents eighteenth- to twentieth-century harmonic practice. Designed to develop music theory skills through written exercises of figured and unfigured basses, harmonization of melodies, and study of ear training, using sight-singing exercises and melodic and harmonic dictation. Prerequisite: MUTH 1200. Not open to students who have completed MUTH 2100 or 2200. Does not count toward a major in music. [3] Bingham.

MUTH 2100. The Syntax of Music. [Formerly MUSC 170] Basic elements of music and notation (including computer notation), introduced through a wide variety of styles. Includes non-tonal and non-Western repertoire. Reinforcement of the elements of MUSC 2100/Musicianship Level I throughout. B.Mus. and B.Mus.Arts students enrolled in MUTH 2100 should also be enrolled in MUSO 1340. Corequisite: MUSC 2100. FALL. [2] Deakin, Slayton.

MUTH 2200. Harmonic Idioms of the Common Practice Period. [Formerly MUSC 171] Principles of harmonic progression in the context of music from the common practice period. Includes figured bass realization, harmonization, analysis, composition, contrapuntal idioms, modulation. Prerequisite: B- or above in MUTH 2100. Corequisite: MUSC 2200. SPRING. [3] Kurek, Michael Rose, Slayton.

MUTH 2300. Repertoire Analysis. [Formerly MUSC 172] A study of diverse and interrelated harmonic, melodic, rhythmic, and structural aspects of the musical repertoire from the common practice era.

Approaches to understanding various historical styles through composition and through analysis and interpretation of representative works from each era. Includes study of invention and fugue. Prerequisite: C- or above in MUTH 2200. Corequisite: MUSC 2300. FALL. [3] Michael Rose, Kurek, Link, Slayton.

MUTH 2400. Musical Expansion: The Twentieth Century to the Present. [Formerly MUSC 173] Late-romantic, modernist, and post-modern compositional practices, including freely chromatic and non-functional harmony, ordered and unordered sets, post-tonal formal design, contemporary rhythmic devices, indeterminacy, and quotation. Prerequisite: C- or above in MUTH 2300. Corequisite: MUSC 2400. SPRING. [3] Link, Kurek, Michael Rose, Slayton.

MUTH 3100. Individual Theory Instruction (Elective). [Formerly MUSC 227] Individual instruction and seminars. Score analysis and style-study composition. Prerequisite: MUTH 2400 and consent of instructor. May be repeated for credit. [Variable credit: 1-3 each semester] Music theory faculty.

MUTH 3110. Orchestration. [Formerly MUSC 224] Technical and aesthetic considerations in composing or transcribing for individual orchestral instruments, sections, and full orchestra. Score analysis and composition projects. Prerequisite: B- or above in MUTH 2100. SPRING. [3] Kurek.

MUTH 3120. Jazz Theory. [Formerly MUSC 248] An exploration of harmonic syntax, melodic construction, and song forms in jazz. Includes analysis, directed listening, and practice hearing jazz chords and chord progressions. Prerequisite: MUTH 1210, or MUTH 2200/MUSC 2200. Recommended: MUSO 1220. SPRING. [2] Middagh.

MUTH 3130. Techniques of Choral Composition. [Formerly MUSC 223] Technical and aesthetic considerations involved in arranging and composing for combinations of voices, from two-part to larger choral ensembles, accompanied and unaccompanied. Score analysis and composition projects. Prerequisite: MUTH 2200 or consent of instructor. SPRING. [3] Carl Smith. (Offered alternate years)

MUTH 3140. Historical Traditions in Composition and in Performance. [Formerly MUSC 251] Topical approach to historical performance traditions, 1610-1897, addressed through musical analysis and through study of historical performance styles. Emphasis on application of these interpretive skills to live performance. Prerequisite: MUTH 2200. FALL. [3] Carl Smith.

MUTH 3150. Early Keyboard Literature. [Formerly MUSC 255] Keyboard music from the late fifteenth century to the early eighteenth century. Compositional techniques and performance practices; study of period instruments; literature for clavichord, harpsichord, organ, and fortepiano. FALL. [2] Carl Smith. (Offered alternate years)

MUTH 3160. Counterpoint: 16th Century Principles. [Formerly MUSC 261] Techniques for handling independent musical lines according to sixteenth-century principles. Species counterpoint in two voices, composition in three and four voices, and in non-modal and freely tonal styles, but not high baroque style. Prerequisite: MUTH 2200. SPRING. [3] Carl Smith. (Offered alternate years)

MUTH 3170. Techniques of Composing for Media. Techniques of effective composing for media such as film, television, games, and internet, including composing with virtual instruments, digital audio mixing, and synchronizing to video. Creation of a 5-7 minute original sound track or film composing demo reel. Prerequisite: COMP 1100 or MUTH 2400 or permission of instructor. FALL. [2] Kurek.

MUTH 3200. Chromatic Harmony in the Romantic Era. [Formerly MUSC 226] Intensive analysis of challenging standard repertoire by three generations of romantic composers, whose ingenious extensions of classic period strategies of tonal organization require interpretive tools beyond the scope of the core theory curriculum. Investigation of both large and small forms. Focus on relationships between harmonic and structural symmetries. Prerequisite: MUTH 2400. [3] Michael Rose. (Offered alternate years.)

MUTH 3210. Post-tonal Analysis. [Formerly MUSC 225] Exploration of the post-tonal analytical techniques through intensive study of selected works of composers from the early twentieth century to the present, including Debussy, Scriabin, Schoenberg, Berg, Webern, Stravinsky, Copland, Dallapiccola, Boulez, Cage, Berio, Feldman, Lachenmann. Prerequisite: MUTH 2400. SPRING. [2] Slayton. (Offered alternate years)

MUTH 3220. Musical Explorations: Bartók. [Formerly MUSC 280] In-depth study of the life and music of Béla Bartók; includes detailed investigation of salient theoretical concepts, formal structures, and the composer's integration of various regional folk musics into his own works. Prerequisite: MUTH 2400 or permission of instructor. SPRING. [2] Slayton.

MUTH 3222. Musical Explorations: Britten. An introduction to the music of Benjamin Britten through close analysis of representative compositions and exploration of the composer's substantial recorded legacy. Focus on the formal and theoretical aspects of Britten's work with a detailed consideration of how musical resources and compositional techniques are employed to suggest a sense of place. Prerequisite: MUTH 2400 or permission of instructor. SPRING. [2] Deakin.

MUTH 3890. Special Topics in Music Theory. [Formerly MUSC 294] Advanced study in theory, focused on various topics from year to year, including such areas as advanced counterpoint, analysis of a specific composer, Schenkerian analysis, etc. Prerequisite: Varies by topic. [2 or 3, as listed] Kurek, Link, Michael Rose, Slayton, Carl Smith.

MWEL: Musicians' Wellness

MWEL 1120. The Alexander Technique I. [Formerly MUSO 162A] An accurate kinesthetic sense of the structure and movement of the body through hands-on and verbal instruction in body mapping and the principles developed by F. M. Alexander. Emphasis on ordinary daily activities. Offered on a pass/fail basis only. FALL, SPRING. [1] Ahner.

MWEL 1121. The Alexander Technique II. [Formerly MUSO 162B] Further exploration of the principles of the technique applied to daily activities and developmental movement. Emphasis on individual experiences within the context of the class. Offered on a pass/fail basis only. Prerequisite: MWEL 1120. FALL, SPRING. [1] Ahner.

MWEL 1130. Meditation for Musicians. [Formerly MUSO 164] A practice-centered approach helps students develop a regular meditation routine. Each weekly session involves meditation, in-class reading, listening, and performance. Prerequisite: Open to music majors and minors. Offered on a pass/fail basis. FALL, SPRING. [1] Joshua McGuire.

MWEL 1140. Tai Chi for Musicians. [Formerly MUSO 165] Principles of Tai Chi applied to musical performance. The practice and understanding of anatomical movement, with emphasis on prevention of injury. Offered on a pass/fail basis. FALL, SPRING. [1] Hui-Lio.

MWEL 2120. The Performer and the Body. [Formerly MUSO 163] Application of the Alexander technique in a small group setting with attention to individuals and their particular performance modes, i.e., public speaking, singing, dancing, acting, playing an instrument. Offered on a pass/fail basis. May be repeated once for credit. Prerequisite: MWEL 1120. FALL, SPRING. [1] Ahner

Group Performance Instruction

GTR 1010. Introduction to Guitar I. [Formerly MUSP 104A] A foundation in basic guitar technique that will prepare students for future studies in classical, jazz, or popular styles of guitar. Emphasis on chordal accompaniment, development of reading skills, improvisational techniques with melodies and chords. One 50-minute group lesson weekly. Fees apply to non-B.Mus./B.Mus.Arts students. [1] Kimbrough.

GTR 1020. Introduction to Guitar II. [Formerly MUSP 104B] A foundation in basic guitar technique that will prepare students for future studies in classical, jazz, or popular styles of guitar. Emphasis on chordal

accompaniment, development of reading skills, improvisational techniques with melodies and chords. One 50-minute group lesson weekly. Prerequisite: GTR 1010 or permission of instructor. Fees apply to non-B.Mus./B.Mus.Arts students. [1] Kimbrough.

PERC 1010. Introduction to Percussion. [Formerly MUSP 105A] Basic percussion techniques with emphasis on rolls, embellishments, and sticking combinations, and their applications for concert and popular musical styles. Prerequisite: Previous musical experience and an understanding of notation. One 50-minute group lesson weekly. Fees apply to non-B.Mus./B.Mus.Arts students. [1] Vinson.

PIAN 1010. Introduction to Piano I. [Formerly MUSP 102A] A total-musicianship approach to the piano. Repertoire, technique, and sight reading are studied. Also includes the study of transposition, harmonization, and improvisation. One 50-minute group lesson weekly. Fees apply. Not open to B.Mus./B.Mus.Arts students. FALL, SPRING. [1]

PIAN 1020. Introduction to Piano II. [Formerly MUSP 102B] A total-musicianship approach to the piano. Repertoire, technique, and sight reading are studied. Also includes the study of transposition, harmonization, and improvisation. One 50-minute group lesson weekly. Prerequisite: PIAN 1010 or permission of instructor. Fees apply. Not open to B.Mus./B.Mus.Arts students. FALL, SPRING. [1]

VLA 1010. Viola for Violinists. [Formerly MUSO 116] Technical principles, practices, and strategies for violinists learning viola. Investigation of solo and chamber music repertoire; historical evolution of the viola. Viola provided. Prerequisite: Approval of violin instructor and course instructor. FALL, SPRING. [1] Plummer.

Individual Performance Instruction

Courses are repeatable. Students may accrue up to 4 credit hours per semester of enrollment.

BNJO 1100. Banjo. [Formerly MUSP 197] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. New students by interview only. Fees apply to non-B.Mus. students [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Brown.

BRQ 1100. Baroque Strings. Individual practice focused on the art and practice of baroque violin, viola, cello, or bass, with emphasis on tone quality, technique, rhythm, interpretation, and literature. [1-2] Romero Ramos.

BASS 1100. Double Bass (Elective/Minors/Second Majors). [Formerly MUSP 185] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus. students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Reist, Wanner.

BASS 2100. Double Bass (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 185] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Reist, Wanner.

BASS 2200. Double Bass (Performance Majors Freshmen/Sophomores). [Formerly MUSR 185] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Reist, Wanner.

BASS 4100. Double Bass (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 285] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies juniors and seniors. [2] Reist, Wanner.

BASS 4200. Double Bass (Performance Majors Juniors/Seniors). [Formerly MUSR 285] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique,

rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Reist, Wanner.

BSSN 1100. Bassoon (Elective/Minor/Second Major). [Formerly MUSP 175] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Kolkay.

BSSN 2100. Bassoon (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 175] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Kolkay.

BSSN 2200. Bassoon (Performance Majors Freshmen/Sophomores). [Formerly MUSR 175] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Kolkay.

BSSN 4100. Bassoon (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 275] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Kolkay.

BSSN 4200. Bassoon (Performance Majors Juniors/Seniors). [Formerly MUSR 275] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Kolkay.

CLLO 1100. Cello (Elective Credit and General Music Minors). [Formerly MUSP 184] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] K. Cassel, Mansell, S. Reist, Wang.

CLLO 2100. Cello (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 184] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Wang.

CLLO 2200. Cello (Performance Majors Freshmen/Sophomores). [Formerly MUSR 184] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Wang.

CLLO 4100. Cello (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 284] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Wang.

CLLO 4200. Cello (Performance Majors Juniors/Seniors). [Formerly MUSR 284] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Wang.

CLAR 1100. Clarinet (Elective/Minor/Second Major). [Formerly MUSP 173] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Jackson, Lee.

CLAR 2100. Clarinet (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 173] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. and integrated studies majors. [2] Jackson.

CLAR 2200. Clarinet (Performance Majors Freshmen/Sophomores). [Formerly MUSR 173] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Jackson.

CLAR 4100. Clarinet (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 273] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Jackson.

CLAR 4200. Clarinet (Performance Majors Juniors/Seniors). [Formerly MUSR 273] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jackson.

DRUM 1100. Drumset (elective credit). [Formerly MUSP 180A] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] D. Phillips.

EUPH 1100. Euphonium (Elective/Minor/Second Major). [Formerly MUSP 190] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Long.

EUPH 2100. Euphonium (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 190] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Long.

EUPH 2200. Euphonium (Performance Majors Freshmen/Sophomores). [Formerly MUSR 190] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Long.

EUPH 4100. Euphonium (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 290] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Long.

EUPH 4200. Euphonium (Performance Majors Juniors/Seniors). [Formerly MUSR 290] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Long.

FDDL 1100. Fiddle. [Formerly MUSP 192] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Combs, Plohman.

FLUT 1100. Flute (Elective/Music Minors/Second Major). [Formerly MUSP 171] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to

non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Barth, Fagan.

FLUT 2100. Flute (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 171] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Barth.

FLUT 2200. Flute (Performance Majors Freshmen/Sophomores). [Formerly MUSR 171] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Barth.

FLUT 4100. Flute (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 271] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Barth.

FLUT 4200. Flute (Performance Majors Juniors/Seniors). [Formerly MUSR 271] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Barth.

GTR 1030. Fingerboard Harmony. [Formerly MUSO 114] Individual instruction in advanced guitar skills: modal positions, modal patterns, score reading, arpeggios, transposition, and chord progressions. Fees apply to non-B.Mus. students. Prerequisite: GTR 1020 or permission of instructor. FALL, SPRING. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Kimbrough.

GTR 1100. Guitar (Elective/Minor/Second Major). [Formerly MUSP 188] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Todd.

HARP 1100. Harp (Elective/Minor/Second Major). [Formerly MUSP 181] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Agresta Copely.

HARP 2100. Harp (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 181] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Agresta Copely.

HARP 2200. Harp (Performance Majors Freshmen/Sophomores). [Formerly MUSR 181] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Agresta Copely.

HARP 4100. Harp (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 281] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Agresta Copely.

HARP 4200. Harp (Performance Majors Juniors/Seniors). [Formerly MUSR 281] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Agresta Copely.

HRPS 1100. Harpsichord. [Formerly MUSP 193] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students

[Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor]. Brecht.

HORN 1100. Horn (Elective/Minor/Second Major). [Formerly MUSP 176] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Norton.

HORN 2100. Horn (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 176] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Norton.

HORN 2200. Horn (Performance Majors Freshmen/Sophomores). [Formerly MUSR 176] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Norton.

HORN 4100. Horn (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 276] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Norton.

HORN 4200. Horn (Performance Majors Juniors/Seniors). [Formerly MUSR 276] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Norton.

JAZZ 1100. Jazz Private Instruction. [Formerly MUSO 133] Private instruction on standard jazz instruments and voice. Repertory and techniques chosen to meet individual needs. Open by audition. Private lesson fees apply to non-B.Mus./B.Mus.Arts students. May be repeated for credit. [Variable credit: 1-2 each semester. Multiple section enrollment possible. Students may accrue up to 6 credit hours per semester of enrollment]. Coffin, Dudley, Kimbrough, Middagh, Phillips, Spencer, Watson Utterstrom.

JAZZ 1150. Jazz and Commercial Arranging. Individual instruction in jazz and commercial arranging, content ranging from lead sheet writing to studio orchestra. Repertoire and techniques chosen to meet individual needs. [1-2] Middagh.

MNDL 1100. Mandolin. [Formerly MUSP 195] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Pearcy.

OBOE 1100. Oboe (Elective/Minor/Second Major). [Formerly MUSP 172] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Hauser, Wiesmeyer.

OBOE 2100. Oboe (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 172] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Hauser.

OBOE 2200. Oboe (Performance Majors Freshmen/Sophomores). [Formerly MUSR 172] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Hauser.

OBOE 4100. Oboe (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 272] Individual instruction focused on the

art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Hauser.

OBOE 4200. Oboe (Performance Majors Juniors/Seniors). [Formerly MUSR 272] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Hauser.

ORGN 1100. Organ (Elective/Minor/Second Major). [Formerly MUSP 187] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Brecht.

PERC 1100. Percussion (Elective/Minor/Second Major). [Formerly MUSP 180] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Jung.

PERC 2100. Percussion (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 180] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Jung.

PERC 2200. Percussion (Performance Majors Freshmen/Sophomores). [Formerly MUSR 180] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Jung.

PERC 4100. Percussion (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 280] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Specialized study in drumset, jazz vibraphone or contemporary marimba is available. Open only to B.Mus.Arts and integrated studies juniors and seniors; and for elective credit to Percussion Performance juniors and seniors. [2] Jung.

PERC 4200. Percussion (Performance Majors Juniors/Seniors). [Formerly MUSR 280] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Specialized study in drumset, jazz vibraphone or contemporary marimba is available. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jung.

PIAN 1100. Piano (Elective/Minor/Second Major). [Formerly MUSP 186] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Conner, Dorfman, Hwang, Krieger, Middleton, Nies, Reagan, Yang.

PIAN 2100. Piano (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 186] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Dorfman, Krieger, Nies.

PIAN 2200. Piano (Performance Majors Freshmen/Sophomores). [Formerly MUSR 186] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Dorfman, Krieger, Nies.

PIAN 4100. Piano (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 286] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique,

rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Dorfman, Krieger, Nies.

PIAN 4200. Piano (Performance Majors Juniors/Seniors). [Formerly MUSR 286] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Dorfman, Krieger, Nies.

SAX 1100. Saxophone (Elective/Minor/Second Major). [Formerly MUSP 174] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Utley.

SAX 2100. Saxophone (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 174] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Utley.

SAX 2200. Saxophone (Performance Majors Freshmen/Sophomores). [Formerly MUSR 174] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Utley.

SAX 4100. Saxophone (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 274] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Utley.

SAX 4200. Saxophone (Performance Majors Juniors/Seniors). [Formerly MUSR 274] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Utley.

STPN 1100. Steel Drum. [Formerly MUSP 198] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open for elective credit. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Britain.

TROM 1100. Trombone (Elective/Minor/Second Major). [Formerly MUSP 178] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Wilson.

TROM 2100. Trombone (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 178] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies majors. [2] Wilson.

TROM 2200. Trombone (Performance Majors Freshmen/Sophomores). [Formerly MUSR 178] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Wilson.

TROM 4100. Trombone (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 278] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Wilson.

TROM 4200. Trombone (Performance Majors Juniors/Seniors). [Formerly MUSR 278] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique,

rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Wilson.

TRPT 1100. Trumpet (Elective/Minor/Second Major). [Formerly MUSP 177] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Kunkee, Sibaja.

TRPT 2100. Trumpet (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 177] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Sibaja.

TRPT 2200. Trumpet (Performance Majors Freshmen/Sophomores). [Formerly MUSR 177] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Sibaja.

TRPT 4100. Trumpet (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 277] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Sibaja.

TRPT 4200. Trumpet (Performance Majors Juniors/Seniors). [Formerly MUSR 277] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Sibaja.

TUBA 1100. Tuba (Elective/Minor/Second Major). [Formerly MUSP 179] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Long.

TUBA 2100. Tuba (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 179] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Long.

TUBA 2200. Tuba (Performance Majors Freshmen/Sophomores). [Formerly MUSR 179] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Long.

TUBA 4100. Tuba (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 279] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Long.

TUBA 4200. Tuba (Performance Majors Juniors/Seniors). [Formerly MUSR 279] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Long.

VLA 1100. Viola (Elective/Minor/Second Major). [Formerly MUSP 183] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B.Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Reinker.

VLA 2100. Viola (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 183] Individual instruction focused on

the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. and integrated studies majors. [2] Kochanowski, Plummer.

VLA 2200. Viola (Performance Majors Freshmen/Sophomores). [Formerly MUSR 183] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Kochanowski, Plummer.

VLA 4100. Viola (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 283] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Kochanowski, Plummer.

VLA 4200. Viola (Performance Majors Juniors/Seniors). [Formerly MUSR 283] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Kochanowski, Plummer.

VLN 1100. Violin (Elective/Minor/Second Major). [Formerly MUSP 182] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Blackwell, Combs, Heard, Huebl, McGann, Miahky, Romero Ramos.

VLN 2100. Violin (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 182] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Heard, Huebl, Miahky.

VLN 2200. Violin (Performance Majors Freshmen/Sophomores). [Formerly MUSR 182] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [4] Heard, Huebl, Miahky.

VLN 4100. Violin (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 282] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Heard, Huebl, Miahky.

VLN 4200. Violin (Performance Majors Juniors/Seniors). [Formerly MUSR 282] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Heard, Huebl, Miahky.

VOIC 1100. Voice (Elective/Minor/Second Major). [Formerly MUSP 189] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. New students by interview only. Fees apply to non-B. Mus./B.Mus.Arts students. [Variable credit: 1-2, based on lesson length and repertoire as agreed on with instructor] Hewlett Elder, V. Nelson, Prentice.

VOIC 2100. Voice (B.Mus.Arts and Integrated Studies Freshmen/Sophomores). [Formerly MUSP 189] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus. Arts and integrated studies majors. [2] Jarman, Nelson, Shay.

VOIC 2200. Voice (Performance Majors Freshmen/Sophomores). [Formerly MUSR 189] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to freshman and sophomore performance majors. [3] Jarman, Nelson, Shay.

VOIC 4100. Voice (B.Mus.Arts and Integrated Studies Juniors/Seniors). [Formerly MUSP 289] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to B.Mus.Arts and integrated studies juniors and seniors. [2] Jarman, Nelson, Shay.

VOIC 4200. Voice (Performance Majors Juniors/Seniors). [Formerly MUSR 289] Individual instruction focused on the art and practice of the instrument, with emphasis on tone quality, technique, rhythm, interpretation, and literature. Open only to junior and senior performance majors. Prerequisite: Successful completion of upper divisional hearing. [4] Jarman, Nelson, Shay.

VLN 1000. Violin Performance/Studio Class. [Formerly MUSO 109B] Weekly observation and participation. Required of all violin majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Heard, Huebl, and Miahky.

VOIC 1000. Voice Performance Class. [Formerly MUSO 109F] Weekly observation and participation. Required of all voice majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Voice faculty.

Performance Classes

All courses are repeatable.

BASS 1000. Bass Performance Class. [Formerly MUSO 109L] Weekly observation and participation. Required of all bass majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Reist, Wanner.

BSSN 1000. Bassoon Performance Class. [Formerly MUSO 110E] Weekly observation and participation. Required of all bassoon majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Kolkay.

CLAR 1000. Clarinet Performance Class. [Formerly MUSO 110F] Weekly observation and participation. Required of all clarinet majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Jackson.

CLLO 1000. Cello Performance Class. [Formerly MUSO 109C] Weekly observation and participation. Required of all cello majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Wang.

FLUT 1000. Flute Performance Class. [Formerly MUSO 109A] Weekly observation and participation. Required of all flute majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Barth.

HARP 1000. Harp Performance Class. Weekly observation and participation. Required of all harp majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Agresta Copely.

HORN 1000. Horn Performance Class. [Formerly MUSO 111A] Weekly observation and participation. Required of all horn majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Norton.

OBOE 1000. Oboe Performance Class. [Formerly MUSO 110D] Weekly observation and participation. Required of all oboe majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Hauser.

PERC 1000. Percussion Performance Class. [Formerly MUSO 110G] Weekly observation and participation. Required of all percussion majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Jung.

PIAN 1000. Piano Performance Class. [Formerly MUSO 109D] Weekly observation and participation. Required of all piano majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Dorfman, Krieger, Nies.

SAX 1000. Saxophone Performance Class. [Formerly MUSO 110L] Weekly observation and participation. Required of saxophone majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Utley.

TROM 1000. Trombone Performance Class. [Formerly MUSO 111B] Weekly observation and participation. Required of all trombone majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Wilson.

TRPT 1000. Trumpet Performance Class. [Formerly MUSO 110A] Weekly observation and participation. Required of all trumpet majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Sibaja.

TUBA 1000. Low Brass Performance Class. [Formerly MUSO 110B] Weekly observation and participation. Required of all euphonium and tuba majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Long.

VLA 1000. Viola Performance Class. [Formerly MUSO 109G] Weekly observation and participation. Required of all viola majors, B.Mus. and B.Mus.Arts. Offered on a pass/fail basis. [0] Kochanowski, Plummer.



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School of Engineering

PHILIPPE M. FAUCHET, Ph.D., Dean
E. DUCO JANSEN, Ph.D., Senior Associate Dean for Graduate Studies and Faculty Affairs
CYNTHIA B. PASCHAL, Ph.D., Senior Associate Dean for Undergraduate Education
PETER T. CUMMINGS, Ph.D., Associate Dean for Research
WILLIAM H. ROBINSON III, Ph.D., Associate Dean for Academic Success
TERESA ROGERS, Associate Dean for Development and Alumni Relations
CHRISTOPHER J. ROWE, Ed.D., Associate Dean for External Relations
HECTOR SILVA, M.B.A, Chief Business Officer
BURGESS MITCHELL, M.Ed., Assistant Dean for Student Services
JULIANNE VERNON, Ph.D., Assistant Dean for Academic Programs
THOMAS J. WITHROW, Ph.D., Assistant Dean for Design
ROBIN L. CARLSON, Assistant to the Dean
MADDIE FRENCH, M.A, Academic Counselor
ADAM MCKEEVER-BURGETT, M.Div., Director of Academic Services and Data Analytics

Named and Distinguished Professorships

DOUGLAS E. ADAMS, Distinguished Professor of Civil and Environmental Engineering; Daniel F. Flowers Chair
GAUTAM BISWAS, Cornelius Vanderbilt Chair
JAMES A. CADZOW, Centennial Professor of Electrical Engineering, Emeritus
THOMAS A. CRUSE, H. Fort Flowers Professor of Mechanical Engineering, Emeritus
PETER T. CUMMINGS, John R. Hall Professor of Chemical Engineering
BENOIT M. DAWANT, Cornelius Vanderbilt Chair in Engineering
PHILIPPE M. FAUCHET, Bruce and Bridgitt Evans Dean's Chair in Engineering
DANIEL M. FLEETWOOD, Olin H. Landreth Professor of Engineering
KENNETH F. GALLOWAY, Distinguished Professor of Engineering, Emeritus
MICHAEL GOLDFARB, H. Fort Flowers Professor of Mechanical Engineering
JOHN C. GORE, Chancellor's University Professor of Radiology and Radiological Sciences and Biomedical Engineering
THOMAS R. HARRIS, Orrin Henry Ingram Distinguished Professor of Engineering, Emeritus
GEORGE M. HORNBERGER, Distinguished University Professor; Craig E. Philip Professor of Engineering
ROBERT W. HOUSE, Orrin Henry Ingram Distinguished Professor of Engineering Management, Emeritus
DAVID S. KOSSON, Cornelius Vanderbilt Chair
MICHAEL R. KING, J. Lawrence Wilson Professor of Engineering
M. DOUGLAS LEVAN, J. Lawrence Wilson Professor of Engineering, Emeritus
SANKARAN MAHADEVAN, John R. Murray Sr. Chair in Engineering
ANITA MAHADEVAN-JANSEN, Orrin H. Ingram Chair in Biomedical Engineering
CLARE M. McCABE, Cornelius Vanderbilt Chair
ARTHUR M. MELLOR, Centennial Professor of Mechanical Engineering, Emeritus
MICHAEL I. MIGA, Harvie Branscomb Professor
SOKRATES T. PANTELIDES, University Distinguished Professor of Physics and Engineering
FRANK L. PARKER, Distinguished Professor of Environmental and Water Resources Engineering, Emeritus
PETER N. PINTAURO, H. Eugene McBrayer Professor of Chemical Engineering
CYNTHIA A. REINHART-KING, Cornelius Vanderbilt Chair
DOUGLAS C. SCHMIDT, Cornelius Vanderbilt Chair
RONALD D. SCHRIMPF, Orrin Henry Ingram Professor of Engineering

RICHARD E. SPEECE, Centennial Professor of Civil and Environmental Engineering, Emeritus
JANOS SZTIPANOVITS, E. Bronson Ingram Distinguished Professor of Engineering
TAYLOR G. WANG, Centennial Professor of Materials Science and Engineering, Emeritus; Centennial Professor of Mechanical Engineering, Emeritus
ROBERT J. WEBSTER III, Richard A. Schroeder Chair in Mechanical Engineering
SHARON M. WEISS, Cornelius Vanderbilt Chair
JOHN P. WIKSWO, JR., Gordon A. Cain University Professor; A. B. Learned Professor of Living State Physics

Department Chairs and Division Director

MICHAEL R. KING, Biomedical Engineering
G. KANE JENNINGS, Chemical and Biomolecular Engineering
DOUGLAS E. ADAMS, Civil and Environmental Engineering
DANIEL M. FLEETWOOD, Electrical Engineering and Computer Science
YIORGOS KOSTOULAS, General Engineering
NILANJAN SARKAR, Mechanical Engineering

Faculty

For a list of current faculty, please visit virg.vanderbilt.edu/webtools/registry.

Engineering Education in a University Setting

VANDERBILT University School of Engineering is the largest and oldest private engineering school in the South. Classes offering engineering instruction began in 1879, and seven years later Engineering was made a separate department with its own dean. The school's program emphasizes the relationship of the engineering profession to society and prepares engineers to be socially aware as well as technically competent.

The mission of the School of Engineering is threefold: to prepare undergraduate and graduate students for roles that contribute to society; to conduct research to advance the state of knowledge and technology and to disseminate these advances through archival publications, conference publications, and technology transfer; and to provide professional services to the community.

The school strives to meet the undergraduate education portion of its mission by offering degree programs in fields of engineering relevant to the needs of society. An objective of these programs is to provide a technical education integrated with strong humanities, fine arts, and social sciences subject matter to provide the requisite foundation for lifelong learning. The availability of second majors and minors in subject areas in other schools and colleges of the university increases opportunities for engineering students to enhance their education by pursuing studies in the non-technical disciplines. Engineering students take close to 50 percent of their courses outside of the School of Engineering and associate daily with peers from other schools and colleges within the university.

Another objective is to accommodate students who will continue their studies at the graduate level in engineering or in other professional fields, as well as those who intend to enter engineering practice upon graduation. To this end, our programs emphasize mathematics and engineering sciences, yet provide significant exposure to engineering design and hands-on laboratory experiences.

A large fraction of the student body is destined for management positions early in their working careers. To meet these students' needs, the Engineering Management program offers a well-integrated minor.

The bachelor of engineering serves those programs in engineering where professional registration through state boards is desirable or necessary. Typically, about 90 percent of the students are enrolled in programs that are accredited by the Engineering Accreditation Commission or the Computing Accreditation Commission of ABET (abet.org).

The bachelor of science addresses the needs of those students seeking specialized programs not served by conventional engineering degree programs. The degree provides students with a general scientific and engineering background while allowing individual curricular desires to be addressed. For example, students who want to use a degree from the School of Engineering to enter the primary or secondary education fields may include the necessary courses in education from Peabody College in their engineering degree program.

Students at all levels have the opportunity to work with faculty in the generation of new knowledge. Those planning for graduate studies and research are especially encouraged to participate in individual topics and research courses to fulfill

that desire. Engineering students also participate in the university's Summer Research Program for Undergraduates.

Facilities

The School of Engineering is housed in five main buildings with several satellite facilities. William W. Featheringill Hall houses a three-story atrium designed for student interaction and social events, more than fifty teaching and research laboratories with the latest equipment and computer resources, and project rooms. The new Engineering and Science Building is an eight-story state-of-the-art building that houses the Wond'ry at the Innovation Pavilion, numerous research labs, interactive classrooms, clean rooms, and space for students to work, study, and socialize. School administrative offices and several classrooms are located on the ground floor of the Science and Engineering Building in Stevenson Center, which also houses the Biomedical Engineering department on the 8th and 9th floors. Jacobs Hall, which flanks Featheringill Hall, contains laboratories, offices, and classrooms serving both the Civil and Environmental Engineering department and the Electrical Engineering and Computer Science department. Olin Hall houses Chemical and Biomolecular Engineering, Mechanical Engineering, and Materials Science. Several other satellite facilities that are part of the Engineering School include the W. M. Keck Free-Electron Laser Center building, housing the labs and offices of the Biomedical Photonics Center; the LASIR (Laboratory for Systems Integrity and Reliability), a hangar-style facility located off campus and dedicated to scaling up experiments to realistic and full size, including a wind tunnel and military aircraft; the MuMS facility (multiscale modeling and simulation); the Vanderbilt Institute of Software Integrated Systems; and the Institute for Space and Defense Electronics, providing office space, dry laboratories, and conference space.

In all its engineering programs, Vanderbilt recognizes the vital place of experimental and research laboratories in the learning experience. Laboratories are designed to provide the strongest personal contact between students and faculty members consistent with enrollment.

Well-equipped undergraduate laboratories are maintained by the Departments of Chemistry and Physics in the College of Arts and Science, which offers mathematics and basic science courses required of all engineering students. Graduate and undergraduate divisions of these departments maintain teaching and research facilities in the Stevenson Center for the Natural Sciences, as does the Department of Earth and Environmental Sciences. Another supporting department, Biological Sciences, is housed in Medical Research Building III. Most classes in humanities and the social sciences are conducted in Buttrick, Calhoun, Furman, Garland, and Wilson halls.

Accreditation

All programs leading to the B.E. degree are accredited by the Engineering Accreditation Commission of ABET (abet.org). The bachelor of science program in computer science is accredited by the Computing Accreditation Commission of ABET (abet.org).

Employment of Graduates

Of the recent Vanderbilt graduates with baccalaureate degrees in engineering, about 75 percent entered directly into professional practice. Twenty-five percent continued with graduate or professional education. Others pursued diverse careers or other interests. Additional information regarding the employment of engineering graduates is available in the Career Center.

Supporting Organizations

Vanderbilt Engineering Council

The Engineering Council is a student organization whose main goal is facilitating communication between administration, faculty, and students in the School of Engineering. Officers of the Engineering Council are elected by the engineering student body, and representatives from the professional societies complete the organization's membership. While the council has no administrative power, it provides students with a voice in the decision-making process in the School of Engineering.

Professional Societies

The leading national engineering societies have chartered branches or student sections at Vanderbilt. These organizations are run locally by students with the help of a faculty adviser. Meetings are devoted to matters of a technical nature, including outside speakers, plant trips, and other subjects of interest to the membership.

First-year students and sophomores are cordially invited to attend meetings—and juniors and seniors are urged to join—as they will find the work of the professional societies beneficial in orienting them in their careers.

The student professional societies are:

- American Institute of Aeronautics and Astronautics (A.I.A.A.)
- American Institute of Chemical Engineers (A.I.Ch.E)
- American Nuclear Society (ANS)
- American Society of Civil Engineers (A.S.C.E.)
- American Society of Mechanical Engineers (A.S.M.E.)
- American Society for Metals (A.S.M.)
- Association for Computing Machinery (A.C.M.)
- Biomedical Engineering Society
- Institute of Electrical and Electronics Engineers (I.E.E.E.)
- International Society for Hybrid Microelectronics (I.S.H.M.)
- International Society for Optics and Photonics (SPIE)
- National Society of Black Engineers (N.S.B.E.)
- Society of Asian Scientists and Engineers (S.A.S.E.)
- Society of Automotive Engineers (S.A.E.)
- Society of Hispanic Professional Engineers (S.H.P.E.)
- Society of Engineering Science (S.E.S.)
- Society of Women Engineers (S.W.E.)
- Women in Computing
- Women in Science and Engineering

Graduating seniors may join the Order of the Engineer, a society that recognizes the commitment of its members to the profession of engineering.

Degree Programs in Engineering

BACHELOR of engineering degree programs are offered in the areas of biomedical, chemical, civil, computer, electrical, and mechanical engineering. Many of these programs allow considerable flexibility—but students are required to include in their courses of study those bodies of knowledge fundamental to each discipline.

Bachelor of science degree programs offered in the interdisciplinary engineering disciplines often allow strong concentration in other areas of engineering or outside of the

School of Engineering. The B.S. is awarded in the areas of computer science and engineering science.

The school offers the master of engineering (M.Eng.), with emphasis on engineering design and practice, in most areas of study. The Graduate School, through departments of the School of Engineering, offers the research-oriented Ph.D. and M.S. degrees in eight major fields. Degree programs offered by the School of Engineering are shown below.

Degree Programs

	B.E.	B.S.	M.Eng.	M.S.	Ph.D.
Biomedical Engineering	•		•	•	•
Chemical Engineering	•		•	•	•
Civil Engineering	•		•	•	•
Computer Engineering	•				
Computer Science		•		•	•
Cyber-Physical Systems			•		
Electrical Engineering	•		•	•	•
Engineering Management			•		
Engineering Science		•			
Environmental Engineering			•	•	•
Materials Science and Engineering				•	•
Mechanical Engineering	•		•	•	•
Risk, Reliability, and Resilience Engineering			•		

Undergraduate Degrees

Bachelor of Engineering

The bachelor of engineering is offered in biomedical, chemical, civil, computer, electrical, and mechanical engineering. The B.E. degree requirements vary from 125 to 128 semester hours. Students seeking double majors will require somewhat more credit hours.

Bachelor of Science

The bachelor of science is offered in computer science and engineering science, requiring 120 and 121 semester hours, respectively. These programs have more flexibility in elective choice than the B.E. degree programs.

The First Year

Many courses normally scheduled for the first year are common to both the B.E. and B.S. degree programs. While the curriculum

for the first year is generally the same for all students, there are important variations. For example, some major programs require a full year of introductory chemistry; others do not. Students should become familiar with requirements of those programs in which they have an interest and confer with their adviser at the time of enrollment and throughout the first year to plan a program of study that will keep options open as long as possible.

Specimen curricula for the engineering programs are given in the Courses of Study chapter. Requirements for the B.E. and B.S. degrees for the various programs vary in the minimum amount of work and specific course requirements in the basic sciences and in specific subject requirements in mathematics.

Included in the first year is the course Engineering Science 1401–1403 (Introduction to Engineering), which introduces the student to design tools used in all areas of engineering.

Some students may qualify for advanced placement or advanced credit in mathematics, science, the humanities and social sciences, or computer science. If advanced credit is awarded, it will not affect the student's Vanderbilt grade point average.

Mathematics and Physics

Entering engineering students will be placed in the appropriate level mathematics course. Students offering one full year or more of high school credit in analytic geometry and calculus may qualify for advanced placement in a regular sequence by scoring well on the Advanced Placement Examination.

Students with high mathematical ability and achievement may apply for enrollment in the Math 2500-2501 sequence as a substitute for Math 2300. For more information, see the course descriptions under Mathematics in the Arts and Science section of this catalog. For majors requiring Math 2420 (Methods of Ordinary Differential Equations), students may select Math 2400 (Differential Equations with Linear Algebra) as a substitute.

Students with inadequate backgrounds in mathematics may be required to take Math 1005 (Pre-calculus Mathematics). Taking this course constitutes an additional requirement for graduation.

Math 1010-1011 (Probability and Statistical Inference) and Math 1100 (Survey of Calculus) cannot be credited toward a degree in the School of Engineering.

Students with greater interest in physics may enroll in Phys 1911, 1912, 1912L, and 2255L (Principles of Physics I and II and labs) as substitutes for Phys 1601, 1602, 1601L, and 1602L (General Physics I and II and labs), respectively.

Pre-calculus courses Phys 1010, 1010L, 2051, 2052, 2053, and 2054 cannot be credited toward a degree in the School of Engineering.

Liberal Arts Core

In order to provide the elements of a general education considered necessary for responsible practice as an educated engineer, the School of Engineering requires each student to complete at least 18 hours in the Liberal Arts Core comprising:

1. At least 3 hours selected from courses classified in the AXLE Curriculum Course Distribution of the College of Arts and Science as Humanities and Creative Arts (HCA), with the exception of CMST 1500, 2100, 2110, and 2120, and
2. At least 3 hours selected from courses classified in the AXLE Curriculum Course Distribution of the College of Arts and Science as Social and Behavioral Sciences (SBS).

The remaining hours are to be selected from:

1. Courses classified in the AXLE Curriculum Course Distribution of the College of Arts and Science as Humanities and Creative Arts (HCA), International Cultures (INT), History and Culture of the United States (US), Social and Behavioral Sciences (SBS), and Perspectives (P)
2. CS 1151 and ENGM 2440
3. Arabic 1101, Chinese 1011, 1012, 1101, English 1100, French 1101, German 1101, Greek 1101, Hebrew 1101, Italian 1101, Japanese 1011, 1012, 1101, Korean 1101, Latin 1101, Portuguese 1101, Russian 1101, and Spanish 1100, 1101
4. Peabody College courses in Psychology and Human Development numbered 1205, 1207, 1250, 2200, 2250, 2300, 2400, 2500, 2550, 2600, and 3150, and in Human and Organizational Development numbered 1250, 1300, 2100, 2260, 2400, 2500, 2700, and 3232
5. All MUSC, MUSE, MUSO, COMP, MREP, MUTH, and performance courses in the Blair School of Music, except MUSO 1001

Open Electives

Courses taken beyond specified courses and restricted (such as program, technical, and liberal arts) electives for the major may be taken as open electives.

Officer Education

Course offerings in military science and naval science are described in the chapter on Special Programs for Undergraduates near the front of the catalog. All officer education courses designated as eligible for credit may be taken as open electives. In addition, officer education courses in history and political science that carry AXLE designations may be taken as part of the Liberal Arts Core. AFROTC students may count 6 hours of the military courses as open electives.

Master of Engineering

The master of engineering (M.Eng.) is an advanced professional degree awarded by the School of Engineering and especially designed for engineering practitioners who may prefer to work while doing professional study. It is also suitable for individuals who apply directly from undergraduate school—but the thrust of the program is toward professional practice in engineering rather than research or teaching. The degree is offered in biomedical engineering, chemical engineering, civil engineering, cyber-physical systems, electrical engineering, engineering management, environmental engineering, mechanical engineering, and risk, reliability, and resilience engineering.

Students must complete 30 hours of approved course work. A maximum of 6 hours of graduate-level course work may be transferred from another institution, and a maximum period of seven years is allowed to complete the degree. An extensive, written design report shall be submitted on a project approved by the student's project adviser.

Admission to the Master of Engineering program normally requires graduation from an approved undergraduate program in engineering or a related scientific discipline, attainment of a B average in undergraduate courses applicable to the student's career goals, and recommendations containing favorable appraisals of professional promise and attitude. A period of successful work experience prior to application to the program will also be given consideration. For information about admissions, application procedures, and application deadlines for the Master of Engineering programs, please visit engineering.vanderbilt.edu/gradschool.

For international students who did not graduate from an institution in a country where English is the official language, proficiency in English must be shown by a minimum score of 89 on the TOEFL or 7 on the IELTS test.

Digital Learning Programs

The School of Engineering offers two degree programs online: an M.S. in Computer Science, and an M.Eng. in Engineering Management. Courses in these digital learning programs are only available to students enrolled in these online degree programs. For information about admissions, application procedures, and application deadlines for the School of Engineering Digital Learning programs, please visit the website engineeringonline.vanderbilt.edu.

Special Programs

Honors Programs

Honors programs allow selected undergraduate students to develop individually through independent study and research. Individual honors programs are described in the Courses of Study chapter.

Requirements vary somewhat but, in general, to qualify for consideration a student should have (a) completed the technical course requirements of the first two years, (b) attained a minimum grade average of 3.5 in all work taken for credit, and (c) shown evidence indicating a capacity for independent study and/or research. Formal admission is by election of the department concerned. Once admitted, candidates remain in the program only if they maintain a 3.5 or higher grade average.

Accepted candidates normally begin honors study in the junior year, but exceptions may be made for outstanding seniors.

Successful candidates are awarded Honors in their area of interest. This designation appears on their diplomas.

Study Abroad

Vanderbilt's Global Education Office offers approximately thirty programs that allow students to take engineering or computer science courses in English abroad, in locations ranging from Dublin to Sydney, Madrid to Hong Kong. There are no language prerequisites for these programs. These programs also allow students to take a range of liberal arts core and elective courses abroad. In no case, after matriculating at Vanderbilt, may a student participate in a Vanderbilt-approved study abroad program through a different university or through an external agency and then seek to transfer that credit into Vanderbilt. Financial aid can be used for study abroad during the academic year, and scholarships are available to support Vanderbilt-approved summer study abroad options. Students are encouraged to discuss with their academic advisers how best to incorporate study abroad into their four-year plans of study. All students who study abroad must register their travel in advance with Vanderbilt's international security provider. Registration is completed on your behalf if you enroll in a program offered through the Global Education Office. Otherwise, information is available on the GlobalVU website: vanderbilt.edu/global.

Teacher Education

Students who are interested in preparing for licensure as secondary school teachers should plan their programs in consultation with the associate dean in the School of Engineering. The School of Engineering and Peabody College offer a teacher education program leading to secondary school licensure in physics (grades 9 through 12) and computer technology. Students major in engineering science in the School of Engineering and complete a second major in education at Peabody College.

More specific information on professional education course requirements can be found under the Licensure for Teaching chapter in the Peabody College section of this catalog. Inquiries can also be made to the Office of Teacher Licensure at Peabody.

Double Major

It is possible for a student to combine an engineering field with a second area outside the School of Engineering. The student must obtain prior approval of each department and satisfy the requirements of each major, including the requirement regarding minimum grade point average.

Certain double majors involving two programs within the School of Engineering have been approved by the faculty. The approved double majors are biomedical engineering/electrical engineering, and biomedical engineering/chemical engineering.

The double major is indicated on the student's transcript. Only one degree is awarded, from the school in which the student is enrolled.

Minors

A minor consists of at least five courses of at least 3 credit hours each within a recognized area of knowledge. A minor offers students more than a casual introduction to an area, but less than a major. A minor is not a degree requirement, but students may elect to complete one or more. Courses may not be taken on a Pass/Fail basis. A minor for which all designated courses are completed with a grade point average of at least 2.0 will be entered on the transcript at the time of graduation.

When a minor is offered in a discipline that offers a major, only those courses that count toward the major may be counted toward the minor. Students should refer to the appropriate sections of this catalog for specific requirements. Minors are offered in engineering management, materials science and engineering, computer science, computer engineering, electrical engineering, environmental engineering, energy and environmental systems, nanoscience and nanotechnology, scientific computing, and most disciplines of the College of Arts and Science, Blair School of Music, and Peabody College.

Students should declare their intention to pursue minors by completing forms available in the Student Services Office of the School of Engineering. Departments and programs assign advisers to students who declare minors in their areas. Students are responsible for knowing and satisfying all requirements for the minors they intend to complete.

Dual Degree Program with Fisk University

A coordinated dual degree program between the Vanderbilt University School of Engineering and Fisk University is especially designed to permit students to obtain an A.B. degree in biology, chemistry, computer science, physics, or mathematics from Fisk and a B.E. or B.S. degree in engineering from Vanderbilt, generally within five years.

For the first three years, the student is enrolled at Fisk in a science curriculum and, by cross-registration in the second and third years, takes introductory engineering courses at Vanderbilt. During the fourth and fifth years, the student is enrolled at Vanderbilt, following principally an engineering curriculum at Vanderbilt and completing science courses at Fisk. At the end of five years, the student should be able to satisfy the requirements for both bachelor's degrees.

Financial aid is available for qualified, deserving students. Additional information is available from the director of transfer admissions in the Office of Undergraduate Admissions.

Integrated Bachelor and Master of Engineering

On the basis of recommendations containing favorable appraisals of professional promise, undergraduate students in the School of Engineering who have completed at least 75 hours by the end of the second year with at least a 3.0 grade point average may be accepted into an integrated Bachelor of Engineering–Master of Engineering program. This program is currently available in chemical, civil, environmental, and mechanical engineering. The last two years of a student's program are planned as a unit.

With the approval of the student's adviser, the director of graduate studies in the student's major department, and the senior associate dean, students apply through the associate dean for graduate studies for admission to this integrated dual degree program. Upon admission to this program, a second "career" will be set up for the student which will allow the student to start taking graduate courses (course numbers > 5000) during the junior and senior years. These courses will be credited toward the master of engineering. Note that no double counting of courses is allowed (i.e., the student must meet the degree requirements for each degree independent of the other degree). The student typically receives the bachelor's degree at the end of the fourth year and completes the master of engineering during the fifth year. Further information can be obtained from the director of graduate studies of the student's major department.

Accelerated Graduate Program in Engineering

Students who enter Vanderbilt with a significant number of credits (20 to 30 hours), earned either through Advanced Placement tests or in college courses taken during high school, may be eligible for the Accelerated Graduate Program in Engineering. Through this program, a student is able to earn both a bachelor's degree and a master of science in about the same time required for the bachelor's degree or slightly longer. To be eligible for the program, a student must complete 86 hours (senior standing) by the end of the sophomore year with at least a 3.5 grade point average. With the approval of the student's adviser, the director of graduate studies in the student's major department, and the senior associate dean, students apply through the associate dean for graduate studies for admission to this accelerated dual degree program. Upon admission to this program, a second "career" will be set up for the student which will allow the student to start taking graduate courses (course numbers > 5000) during the junior and senior years. These courses will be credited toward the master of science. Note that no double counting of courses is allowed (i.e., the student must meet the degree requirements for each degree independent of the other degree). The student receives the bachelor's degree at the end of the fourth year and typically spends the summer finishing a master's thesis to complete the master of science. Further information can be obtained from the director of graduate studies of the student's major department.

Honors

Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the dean after consideration of faculty recommendations and the grade point averages of the year's summa cum laude graduates.

Latin Honors Designation

Honors noted on diplomas and published in the Commencement Program are earned as follows:

Summa Cum Laude. Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's School of Engineering graduating seniors.

Magna Cum Laude. Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's School of Engineering graduating seniors.

Cum Laude. Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's School of Engineering graduating seniors.

Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded hours, with no temporary or missing grades in any course (credit or non-credit) and no grade of *F*.

Honor Societies

ALPHA ETA MU BETA, the National Biomedical Engineering Honor Society, was installed at Vanderbilt University in 1998 and re-established in 2019. AEMB was established in 1979 to recognize and encourage excellence in the field of biomedical engineering and bioengineering.

TAU BETA PI. The Tennessee Beta chapter of the Tau Beta Pi Association was installed at Vanderbilt University 7 December 1946. Members of Tau Beta Pi are selected from undergraduate students in the School of Engineering who have completed at least four semesters of required work, are in the upper eighth of their class scholastically, and have shown marked qualities of character and leadership; seniors in the upper fifth of their class scholastically are also eligible for election.

CHI EPSILON. The Vanderbilt chapter of Chi Epsilon, installed 18 March 1967, is restricted to undergraduate civil engineering students in the top third of their class. Election is based on grade point average, faculty recommendation, and exceptional achievements in extracurricular campus activities.

ETA KAPPA NU. The Epsilon Lambda chapter of the Eta Kappa Nu Association was established 22 April 1966. Undergraduate members are selected from the upper third of the class in electrical engineering. Eta Kappa Nu recognizes leadership and scholastic accomplishment twice annually, selecting members also from the professional body of practicing engineers.

ALPHA SIGMA MU. The Vanderbilt chapter of Alpha Sigma Mu was installed in 1977. Senior materials engineering students in the upper twenty percent of their graduating class are eligible upon recommendation of departmental faculty.

PI TAU SIGMA. The Delta Alpha chapter of Pi Tau Sigma was installed on the Vanderbilt campus 22 April 1971, for the purpose of recognizing scholastic achievement and professional promise in junior and senior mechanical engineering students. Students are elected to membership twice each year on the basis of academic excellence and recommendations from the faculty and chapter members.

SIGMA XI. The Vanderbilt chapter of the Society of the Sigma Xi recognizes accomplishment, devotion, and originality in scientific research. Associate members are elected annually from graduate-level students of the university.

HONOR SOCIETIES FOR FIRST-YEAR STUDENTS. First-year students who earn a grade point average of 3.5 or better for their first semester are eligible for membership in the Vanderbilt chapter of Phi Eta Sigma and Alpha Lambda Delta.

Other Awards and Prizes

DEAN'S AWARD FOR OUTSTANDING SERVICE. Awarded to the senior candidate in the School of Engineering who has shown remarkable leadership qualities and who has also made the greatest contribution in personal services to the School.

DEAN'S AWARD FOR OUTSTANDING SCHOLARSHIP. Awarded to each member of the senior class who graduates summa cum laude.

PROGRAM AWARDS. The faculty associated with each of the departments of the school annually bestows a certificate and a prize to one member of the graduating class who is judged to have made the greatest progress in professional development during his or her undergraduate career.

AMERICAN INSTITUTE OF CHEMISTS AWARD. Awarded to an outstanding undergraduate student majoring in chemical engineering on the basis of a demonstrated record of leadership, ability, character, scholastic achievement, and potential for advancement of the chemical professions.

GREG A. ANDREWS MEMORIAL AWARD. Endowed in 1969 and awarded to the senior in civil engineering who has been judged by the faculty to have made the greatest progress in professional development and who plans to do graduate work in environmental and water resources engineering.

THOMAS G. ARNOLD PRIZE. Endowed in 1989 and awarded by the biomedical engineering faculty to the senior who presents the best design of a biomedical engineering system or performance of a research project in the application of engineering to a significant problem in biomedical science or clinical medicine.

WALTER CRILEY PAPER AWARD. Endowed in 1978 and awarded in electrical engineering for the best paper on an advanced senior project in electrical engineering.

JAMES SPENSER DAVIS AWARD. Given annually by the student chapter of Eta Kappa Nu in memory of Mr. Davis, this award recognizes excellence in the undergraduate study of electronics.

ARTHUR J. DYER JR. MEMORIAL PRIZE. Endowed in 1938 and awarded in civil engineering to the member of the senior class doing the best work in structural engineering.

WALTER GILL KIRKPATRICK PRIZE IN CIVIL ENGINEERING. Endowed and awarded in the School of Engineering to the most deserving third-year undergraduate student in civil engineering.

WILLIAM A. MA AWARD. Awarded to an outstanding senior majoring in chemical engineering on the basis of a demonstrated record of leadership and scholastic achievement.

WILSON L. AND NELLIE PYLE MISER AWARD. Awarded to the senior engineering student who has been judged by the faculty of mathematics to have excelled in all aspects of mathematics during his or her undergraduate career.

STEIN STONE MEMORIAL AWARD. Endowed in 1948 and awarded in the School of Engineering to the member of the graduating senior class who has earned a letter in sports, preferably in football, and who is adjudged to have made the most satisfactory scholastic and extramural progress as an undergraduate.

ROBERT D. TANNER UNDERGRADUATE RESEARCH AWARD. Awarded to a senior who, in the judgment of the chemical engineering faculty, has conducted at Vanderbilt University the best undergraduate research project.

W. DENNIS THREADGILL AWARD. Awarded to a graduating chemical engineering senior for outstanding achievement in the undergraduate program in honor of a former faculty member and department chair.

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Undergraduate School Catalog

Academic Regulations

Honor System

All academic work at Vanderbilt is done under the honor system (see Life at Vanderbilt chapter).

Responsibility to Be Informed

It is the responsibility of the student to keep informed of course requirements and scheduling. Failure to do so may jeopardize graduation.

Academic Advising

A faculty adviser is appointed for each student. This adviser is chosen from the faculty in the student's major, when the major is known. For students who have not chosen a major upon entry, an adviser who specializes in helping undeclared students explore different pathways and decide upon a major is assigned. If a student later chooses a different department for his or her major, a corresponding change of adviser is made. Engineering students are required to see their advisers at registration and any other time changes must be made in their programs of study. Any student who has academic difficulty is expected to see his or her faculty adviser for counsel. Faculty advisers can also provide useful career guidance.

Professional Registration and Accreditation

Legislation exists in the various states requiring registration of all engineers who contract with the public to perform professional work. Although many engineering positions do not require professional certification, Vanderbilt supports registration and encourages its graduates to take the Fundamentals of Engineering examination as soon as they become eligible.

Bachelor of engineering degrees in biomedical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission of ABET (*abet.org*). Students in these programs may take the Fundamentals of Engineering examination as seniors. In addition, proven professional experience is a requirement for registration. Other state boards may have different rules.

Credit Hour Definition

Credit hours are semester hours; e.g., a three-hour course carries credit of three semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements that exceed this definition. Certain courses (e.g., dissertation research, ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester will be included in the course description.

Normal Course Load

Each semester, regular tuition is charged on the basis of a normal course load of 12 to 18 semester hours. No more than 18 or fewer than 12 hours may be taken in any one semester without authorization from the senior associate dean. There is an extra charge for more than 18 hours at the current hourly rate. Students permitted to take fewer than 12 hours are placed on probation, unless their light load is necessary because of illness or outside employment. A student must be enrolled in a minimum of 12 hours to be classified as a full-time student.

Grading System

Work is graded by letter. *A*, *B*, *C*, and *D* are considered passing grades. The grade *F* signifies failure. A student who withdraws from a course before the date given in the Academic Calendar is given the grade *W*. A student may not withdraw from a course after that date.

Grade Point Average

A student's grade point average is obtained by dividing the total grade points earned by the number of hours for which the student registered, excluding courses taken for no credit, those from which the student has withdrawn, those with the temporary grade of *I* or *M*, and those that are completed with the grade Pass.

Defined Grades with Corresponding Grade Points Per Credit Hour

A+	= 4.0	C+	= 2.3
A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
		F	= 0.0

Pass/Fail Course Provision

Students may elect to take a limited number of courses on a Pass/Fail basis. To enroll for a course on a Pass/Fail basis, students must have completed at least two semesters at Vanderbilt, must have achieved at least sophomore standing, and must not be on academic probation.

In addition, the following regulations apply to students enrolled in the School of Engineering:

1. No more than 9 hours graded Pass will be accepted toward the B.S. or B.E. degree, as designated by each program's curriculum.

Pass/Fail Electives Options by Program

	Open Elective	Liberal Arts Core	Technical Elective
BME	X	X	
CEE	X	X	
ChBE	X		
CMPE	X		
CS	X	X	X
EE	X		
ES	X	X	
ME	X	X	X (non-ME)

2. No more than two courses may be taken on a Pass/Fail basis in any one semester.

3. A minimum of 12 hours must be taken on a graded basis in any semester that a Pass/Fail course is taken. A graduating senior who needs fewer than 12 hours to graduate may take courses on a Pass/Fail basis as long as he or she takes the number of hours needed to graduate on a graded basis.

4. Students may register for grading on a Pass/Fail basis until the close of the Change Period at the end of the second week of classes. Students may change from Pass/Fail to graded status until the deadline date for withdrawing from a course that is published in the Academic Calendar.

Those electing the Pass/Fail option must meet all course requirements (e.g., reports, papers, examinations, attendance, etc.) and are graded in the normal way. Instructors are not informed of the names of students enrolled on a Pass/Fail basis. At the end of the semester, a regular grade is submitted for the student enrolled under the P/F option. Any grade of *D-* or above is converted in the Student Records System to a *P*, while an *F* will be recorded if a student enrolled under this option fails the course. The *P* grade is not counted in the grade point average or used in the determination of honors. The grade of *F* earned under the Pass/Fail option is included in the calculation of the grade point average.

Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. A student who receives a temporary grade is ineligible for the Dean's List.

I: Incomplete

The Incomplete (*I*) is a temporary placeholder for a grade that will be submitted at a later date. The grade of *I* is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The *I* is not intended as a replacement for a failing grade, nor should it be assigned if a student simply misses the final examination. The grade of *M* is used for the latter purpose. The request for an *I* is generally initiated by the student but must be approved and assigned by the instructor. When assigning an Incomplete, the instructor specifies (a) a deadline by which the *I* must be resolved and replaced by a permanent grade and (b) a default course grade that counts the missing work as zero. The deadline may be no later than the end of the next regular semester. Extension beyond that time must be approved by the associate dean. If the work is not completed by the deadline the default grade will become the permanent grade for the course. The Incomplete is not calculated in the GPA, but a student who receives an Incomplete is ineligible for the Dean's List.

M: Missed Final Examination

The grade of *M* is given to a student who misses the final examination and is not known to have defaulted, provided the student could have passed the course had the final examination been successfully completed. The grade of *F* is given if the student could not pass the course even with the final examination. It is the student's responsibility to contact the Office of the Dean before the first class day of the next regular semester to request permission to take a makeup examination. The makeup examination must be taken on or before the tenth

class day of the next regular semester. If the request has not been submitted by the proper time, or if the student fails to take the makeup examination within the prescribed time, the *M* grade will be replaced by a default grade submitted by the instructor when the *M* is assigned.

F: Failure

A subject in which the grade *F* is received must be taken again in class before credit is given. A student who deserts a course without following the correct procedure for withdrawing from it will receive an *F* in the course.

Senior Re-examination. A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed prevents the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from re-examination. The re-examination must be requested through the student's Dean's Office, and, if approved, it is given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination will receive a *D-* in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course. For engineering students taking engineering courses, the senior re-examination policy applies if a student fails not more than one course in the senior year.

RC: The Repeated Course Designator

Courses in which a student has earned a grade lower than *B-* may be repeated under certain conditions. A course in which the student earned a grade between *D-* and *C+*, inclusive, may be repeated only once. A course may be repeated only on a graded basis, even if the course was originally taken Pass/Fail. Courses taken Pass/Fail in which the student earned a Pass may not be repeated. A course cannot be repeated through credit by examination.

Students should note that repeating a course may improve the grade point average, but it may also lead to problems in meeting minimum hour requirements for class standing and progress toward a degree. Repeating a course does not increase the number of hours used in calculation of the grade point average. All grades earned will be shown on the transcript, but only the latest grade will be used for computation of grade point averages.

W: Withdrawal

A student may withdraw from a course at any time prior to the deadline for withdrawal published in the Academic Calendar. The deadline is usually the Friday following the date for reporting mid-semester deficiencies. The *W* is recorded for any course from which a student withdraws. A course in which a *W* is recorded is not used in figuring grade point averages.

Requirements for the Degree

Candidates for a degree must have completed satisfactorily all curriculum requirements, have passed all prescribed examinations, and be free of indebtedness to the university. If graduation requirements change during the time students are in school, they may elect to be bound by the requirements published in the catalog in either their entering or their graduating year.

Grade Point Average Requirements

To be eligible for graduation, a student must have successfully completed all degree requirements and shall have earned a minimum grade point average of 2.000 in (a) all courses taken, (b) courses taken within the School of Engineering, and (c) department courses of each major.

Hours Required for Graduation

The specific course requirements and total hours required for the bachelor's degree vary with the student's major program. Detailed requirements for each program are shown in the specimen curricula in the Courses of Study section.

Residence Requirements

A minimum of four semesters including the last two semesters must be spent in residence in the School of Engineering. A student in the School of Engineering is considered "in residence" if the student is (a) physically present at Vanderbilt and enrolled in Vanderbilt University classes offered on campus, or (b) enrolled in at least 12 credit hours in an approved Vanderbilt study abroad program. During these four or more semesters, the student must have completed at least 60 semester hours of an approved curriculum in one of the degree programs. In unusual cases, an exception to this requirement may be made by the Administrative Committee upon the recommendation of the department concerned.

Immersion Vanderbilt Requirement

To fulfill the university requirement of Immersion Vanderbilt, a student must participate in an intensive learning experience that culminates in the creation of a tangible final project. This requirement applies to all students who enter Vanderbilt as first-year students in or after summer 2018, as second-year students in or after summer 2019, or as third-year students in or after summer 2020.

Immersion Vanderbilt (www.vanderbilt.edu/immersion/) allows students to pursue a multi-year pathway to engage in professional development, civic involvement, creative expression, international study, and/or research. The pathway may focus on one or more of these areas and should provide a structure upon which students can brainstorm, plan, and execute their immersive projects across multiple years. Most engineering students will take advantage of a four-year engineering design experience to satisfy the requirements of Immersion Vanderbilt. Each engineering major offers such a multi-year experience within its curriculum. Students whose plans include professional development may also pursue industrial internships. A research pathway can engage the student in discovery through research in engineering or other fields. Most engineering students will select an immersion experience associated with their major; however, students can pursue an Immersion plan outside their home program. For example, students interested in creative expression might

develop a performance piece, exhibit, or artistic work, while those interested in international study may explore firsthand the culture, language, and history of other countries. Students interested in such immersion plans should consult the Office of Immersion Resources (OIR).

The Immersion Vanderbilt process is composed of three phases over the four-year experience. Phase one involves the creation of a plan that identifies the project, a pathway to completion, and its contribution to a student's overall education. Phase two is the experiential phase, consisting of the equivalent of at least 9 credit hours of work. It may be fulfilled through Vanderbilt courses and/or approved Immersion activities done during the academic year or summer. For most students in the School of Engineering, phase two can be satisfied by hands-on and team-based experiences within their required courses.

Finally, Immersion Vanderbilt culminates in the creation of a final project arising from the experience. Approval and assessment of the project is done by the supervising school or college. Senior design projects in the School of Engineering satisfy the final project requirement for Immersion Vanderbilt, with students presenting the results of their design project at the school's Design Day, held on the last day of classes each spring. For students completing other immersion projects, OIR coordinates a series of showcases open to the entire campus where students display their projects. Upon completion of phase three, OIR conveys that the requirements have been met by showing completion of the Immersion Vanderbilt graduation requirement on the student's degree audit and adding the Immersion project to the student's transcript.

Transfer Credit

It is the student's responsibility to provide all information needed for an assessment of the program for which transfer of credit is requested. Work transferred to Vanderbilt from another institution will not carry with it a grade point average. No course in which a grade below C- was received will be credited toward a degree offered by the School of Engineering.

Transfer students must complete at least 60 hours of work at Vanderbilt. Two of the semesters must be the senior year.

Summer Work at Another Institution

Work that a student contemplates taking at a summer school other than Vanderbilt is treated as transfer work and must be approved in advance in writing through the YES Transfer Credit application. Students must upload a detailed syllabus, which then must be approved by the Office of the University Registrar, the relevant Vanderbilt University department, and the School of Engineering Dean's Office. A course a student has taken at Vanderbilt may not be repeated in another institution to obtain a higher grade. A course will be granted credit at Vanderbilt University only if it is taken at a school with appropriate regional accreditation.

Credit by Examination

In certain circumstances students may be awarded course credit by departmental examination. (This procedure is distinct from the award of credit through the College Board Advanced Placement Examinations, taken prior to a student's first enrollment at Vanderbilt or another college.)

Students who want to earn credit by departmental examination should consult the associate dean concerning procedures. To be eligible, students must be in good standing.

Students must obtain the approval of the chair of the department that is to give the examination and of the instructor designated by the chair. Students may earn up to 8 hours of credit by examination in any one department, although this limitation might be raised on petition to the Administrative Committee. Students may attempt to obtain credit by examination no more than twice in one semester, no more than once in one course in one semester, and no more than twice in one course.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 hours are not charged tuition for hours for which credit by examination is awarded, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses dropped after the change period of registration. Students in this category must pay a fee of \$50 for the cost of administering the examination. Full-time students with a tuition load exceeding 18 hours and students taking fewer than 12 hours pay tuition at the regular rate with no additional fee.

Registration

A period is designated in each semester during which continuing students, after consultation with their advisers, register for work to be taken during the next term. Students can access both their registration appointment times and the registration system via YES (Your Enrollment Services) at yes.vanderbilt.edu.

Auditing

Regularly enrolled students in the School of Engineering who want to audit courses in any of the undergraduate schools of the university must get the written consent of the instructor to attend the class and register to audit the course. Forms are available from the School of Engineering Office of Academic

Services. No permanent record is kept of the audit. Regular students may audit one class each semester.

Change of Course

During the change period of registration as defined in the Academic Calendar, students may add or drop courses without academic penalty after securing approval from their adviser. After the change period, new courses may not be added, except under very unusual circumstances and with the approval of the adviser, the course instructor, and the senior associate dean.

A student may drop a course without entry on the final record, provided the course is dropped during the change period of registration. After the second week of classes and extending to the end of the eighth week, a course may be dropped with approval of the student's adviser; a W (withdrawal) will be recorded.

To drop a course or change sections after the change period ends, the student must procure a Change of Course form from the Office of Academic Services. The student then obtains the signature of his or her adviser and of all instructors involved in the proposed change and returns the form to the Office of Academic Services.

Examinations

Examinations are usually given at the end of each semester in all undergraduate courses except for certain laboratory courses or seminars. Exams will be no longer than three hours in length and are given according to the schedule published in the *Final Examination Schedule*. The School of Engineering does not offer an alternate examination schedule. All examinations are conducted under the honor system.

Class Standing

School of Engineering students are promoted on the basis of cumulative GPA, hours earned, and regular semesters in residence. For the purposes of promotion, a regular semester is defined as any fall or spring term in which a student is enrolled at Vanderbilt University. Test credit and transfer credit can be used to satisfy the credit hour requirement.

VUSE Promotion Standards

Class Standing	GPA Requirement	Credit Hour Requirement	Minimum Residence Requirement
Sophomore	1.80	24 hours earned	2 regular semesters
Junior	1.90	54 hours earned	4 regular semesters
Senior	2.00	86 hours earned	6 regular semesters

Academic Standing

Good Standing

To remain in good academic standing, a student must pursue a program leading toward a degree in the School of Engineering and meet all GPA and hours earned requirements at the conclusion of each fall and spring semester. A first-year student must successfully complete at least 9 hours and earn at least a 1.7 semester GPA each semester to remain in good standing. A sophomore, junior, or senior must complete at least 12 hours and earn at least a 2.0 semester GPA each semester to remain in good standing. In addition, a student must also promote to the next academic class every two regular semesters according

to the VUSE promotion standards (above) to remain in good standing.

Probation

Students who fail to meet the GPA, hours earned, or class standing promotion standards required to remain in good standing will be placed on academic probation. Students who fail to return to good standing after a semester on probation will be continued on probation or dismissed. Students who are on probation for three semesters risk dismissal.

A student authorized by the Administrative Committee to carry fewer than 12 hours because of illness or for some other

approved reason may be placed on probation if the student's work is deemed unsatisfactory.

Dismissal

Any student who is deemed by the Administrative Committee not to be making satisfactory progress toward a degree in engineering will be dismissed from the School of Engineering and from Vanderbilt University. Satisfactory progress includes completing required courses in a timely manner and maintaining a 2.000 GPA in all courses, in the school, and in the student's major. Causes of dismissal include:

- Failure of all courses in any semester
- Three or more semesters on probation
- Failure to promote to the next class standing after three semesters
- Failure to progress toward a degree in the School of Engineering

Dismissed students are eligible to apply for reinstatement to the School of Engineering and to Vanderbilt University after one calendar year. The reinstatement process is outlined at registrar.vanderbilt.edu/reinstatement. Students who are dismissed and later apply for reinstatement are ineligible to receive transfer credit for courses taken while dismissed.

Class Attendance

Students are expected to attend all scheduled meetings of each class in which they are enrolled. At the beginning of each semester, instructors will explain the policy regarding absences in each of their classes. Students having excessive absences will be reported to the Office of the Dean. Class attendance may be a factor in determining the final grade in a course.

Scholarship Requirements

Those students having honor scholarships are expected to maintain a 3.0 grade point average while taking a minimum of 12 hours. Failure to maintain a 3.0 grade point average each year will result in the cancellation of the scholarship.

Grade Reports

A grade report will be available to the student on Academic Record in YES as soon as possible after the conclusion of each semester. This report will give the total hours and grade points earned during the semester, as well as the cumulative hours and grade points earned through that semester. Students should examine these reports carefully and discuss them with their faculty advisers. Any errors should be reported immediately to the Office of Academic Services of the School of Engineering.

A grade reported and recorded in the Office of the University Registrar may be changed only upon written request of the instructor and with approval of the Administrative Committee. The committee will approve such a change only on certification that the original report was in error.

Undergraduate Enrollment in Graduate Courses

A qualified Vanderbilt junior or senior may enroll in courses approved for graduate credit by the graduate faculty. Credit from such courses may be applied to undergraduate degree requirements or, upon the student's admission to the Vanderbilt University Graduate School, toward a graduate degree. Vanderbilt cannot guarantee that another graduate school will

grant credit for such courses. The principles governing this option are as follows:

1. Work taken under this option is limited to courses numbered 5000 and above and listed in the catalog of the Graduate School, excluding thesis and dissertation research courses and similar individual research and reading courses.
2. The student must, at the time of registration, have a 3.5 grade point average in the preceding two semesters.
3. The total course load, graduate and undergraduate courses, must not exceed 18 hours in that semester.
4. The student must obtain the written approval of their academic adviser and the instructor of the course on a form available in the Office of Academic Services.
5. Permission for Vanderbilt undergraduates to enroll in graduate courses does not constitute a commitment on the part of any program to accept the student as a graduate student in the future.
6. An undergraduate student exercising this option will be treated as a graduate student with regard to class requirements and grading standards.

Reserving Credit for Graduate School

1. Undergraduate students who want to count credit earned in a course numbered 5000 and higher for graduate credit must at the time of registration declare their intention on a form available in the Office of Academic Services.
2. The work must be in excess of that required for the bachelor's degree.
3. All of the criteria detailed above regarding the enrollment by undergraduates in graduate courses apply under this option.

Leave of Absence

A student at Vanderbilt or one who has been admitted to Vanderbilt may, with the approval of his or her academic dean, take an official leave of absence for as much as two semesters and a summer session. Leave of absence forms are available in the Office of Academic Services. A student who fails to register in the university at the end of the leave will be withdrawn from the university.

Change of Address

Any change of address should be reported to the School of Engineering Office of Academic Services or the Office of the University Registrar. The university will consider notices or other information delivered if mailed to the address on file in YES.

Normal Program of Study

The normal program of study is 12 to 18 hours per semester. Students must be authorized by the Administrative Committee to register for fewer than 12 hours.

Withdrawal from the University

A student proposing to withdraw from the university must notify the Office of Academic Services of the School of Engineering so that proper clearance may be accomplished and incomplete work is not charged as a failure against the student's record.

Courses of Study

Explanation of Course Numbers and Symbols

1000–1999: Lower-level introductory courses. Generally no prerequisite.
2000–2999: Intermediate undergraduate courses. May have prerequisite courses.
3000–4999: Upper-level undergraduate course. Usually have prerequisite courses.
5000+: Courses for graduate credit.
Bracketed numbers indicate semester hours credit, e.g., [3].
W symbols used in course numbers designate courses that meet departmental writing requirements.

Abbreviations

BME	Biomedical Engineering
CE	Civil Engineering
CHBE	Chemical and Biomolecular Engineering
CMPE	Computer Engineering
CS	Computer Science
EECE	Electrical Engineering and Computer Engineering
ENGM	Engineering Management
ES	Engineering Science
ENVE	Environmental Engineering
ME	Mechanical Engineering
MSE	Materials Science and Engineering
NANO	Nanoscience and Nanotechnology
SC	Scientific Computing

The First Year

The first-year curriculum for all engineering disciplines is:

Specimen Curriculum

FALL SEMESTER		Semester hours
CHEM 1601, 1601L	General Chemistry and Laboratory	4
MATH 1300	Accelerated Single-Variable Calculus I	4
ES 1401–1403	Introduction to Engineering	3
	Elective (Liberal Arts Core Elective preferred)	3
ES 1115	First-year Engineering Seminar (optional)	1
VV 0700	Vanderbilt Visions	0
	Total	14–15
SPRING SEMESTER		Semester hours
CHEM 1602, 1602L‡	General Chemistry and Laboratory	4
or	or	
MSE 1500, 1500L‡	Materials Science I and Laboratory	4
MATH 1301	Accelerated Single-Variable Calculus II	4
PHYS 1601, 1601L	General Physics I and Laboratory	4
CS 1101, 1103, or 1104*	Programming and Problem Solving	3
ES 1001	Engineering iCommons Seminar (optional)	1
	Total	15–16

‡ Chemical engineering and biomedical engineering majors must take CHEM 1602 and 1602L.
 Civil engineering majors must take an area of science in addition to chemistry and physics to satisfy the program basic science elective requirements.

* Computer science, computer engineering, and electrical engineering majors must take CS 1101 or 1104.

Biomedical Engineering

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ASSOCIATE CHAIR W. David Merryman

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DIRECTOR OF GRADUATE STUDIES Cynthia Reinhart-King

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Cook, Dario Englot, Nicholas Ferrell, Giresh Hiremath, Jacob Houghton,

Clayton Kaiser, Ethan Lippmann, Gregor Neuert, Jack H. Noble, Ipek

Oguz, Aron Parekh, Marjan Rafat, Mikail Rubinov, Seth A. Smith, Julie

Sterling, Wesley Thayer, Yuankai Tao, Eric R. Tkaczyk, John T. Wilson,

Lauren Woodard, Junzhong Xu, Karl Zelik

ASSISTANT PROFESSORS OF THE PRACTICE Christina C. Marasco,

Joseph Schlesinger

RESEARCH ASSISTANT PROFESSORS Nick Adams, Charleson S.

Bell, Zhipeng Cao, Logan Clements, Richard Dortch, Brian C. Evans,

Shannon Faley, Yurui Gao, Mukesh Gupta, Kevin Harkins, Dmitry

Markov, Sinead E. Miller, Bryan Millis, Patricia K. Russ, Teresa K.

Sanders, Veniamin Sidorov, Eric Spivey, Zhenjiang Zhang

ADJUNCT ASSISTANT PROFESSORS Valerie Guenst, Kalana Jayawardana

ADJOINT ASSISTANT PROFESSORS Frank Block, Judy T. Lewis, Amber

Simpson

INSTRUCTOR Amanda Buck

THE foundations of biomedical engineering are the same as those in other engineering disciplines: mathematics, physics, chemistry and engineering principles. Biomedical engineering builds on these foundations to solve problems in biology and medicine over the widest range of scales—from the nanoscale and molecular levels to the whole body. Biomedical engineering provides a robust platform for employment in the medical device and instrumentation industries as well as careers in companies that specialize in the development and application of biologics, biomaterials, implants and processes. Our graduates gain entry into nationally recognized graduate schools for continuing studies in biomedical engineering. Biomedical engineering is also a rigorous path for admission to and success in medical school for those students willing and able to excel in mathematics, physics, chemistry, biology, physiology, and engineering.

The Department of Biomedical Engineering at Vanderbilt is unique among biomedical engineering programs in its immediate

proximity to the world class Vanderbilt Medical Center, located on our compact campus. Our School of Medicine is among the top ten in funding from the National Institutes of Health and includes a National Cancer Institute-recognized Comprehensive Cancer Center, a major children's hospital and a Level I trauma center. This proximity and the strong relationships among faculty across multiple schools stimulate high impact research and provide unique educational and research opportunities for students.

Degree Programs. The Department of Biomedical Engineering offers courses of study leading to the B.E., M.S., M.Eng., and Ph.D. Vanderbilt biomedical engineering is a well established program with undergraduate degrees granted continuously since 1965. Our undergraduate curriculum undergoes regular review and revision to ensure relevancy and to maintain full ABET accreditation. Students have complete flexibility in the selection of biomedical engineering, technical, and open electives. This allows students to design their own focus areas such as regenerative medicine and tissue engineering, wearables and point-of-care diagnostics, global health, surgery and engineering, robotics and prosthetics, lasers and medicine, medical imaging, biotechnology and nanomedicine, medical technology and entrepreneurship.

Facilities. The Department of Biomedical Engineering is located in Stevenson Center. Undergraduate instructional laboratories are equipped for study of biomedical processes, measurement methods and instrumentation. These facilities are equipped with embedded systems for instrumentation, design, and testing that mirror professional practice. Specialized facilities for biomedical imaging, biophotonics, surgery and engineering, regenerative medicine, nanobiotechnology, and nanomedicine are used both for faculty-led research and instructional purposes.

Undergraduate Honors Program. With approval of the Honors Program director, junior and senior students in biomedical engineering who have achieved a minimum grade point average of 3.5 may be accepted into the undergraduate Honors Program. Students in the program take at least 6 credit hours of 5000-level or above (graduate) biomedical engineering courses, which can be counted toward the 127-hour undergraduate degree requirements as biomedical engineering electives or which can be taken for graduate school credit. Students in the Honors Program must also complete a two-semester-long research project and present a research report; this is generally accomplished through the BME 3860 and 3861 Undergraduate Research elective courses. Honors students must make a grade point average of 3.0 in these classes and maintain an overall 3.5 GPA to be designated as an honors graduate. The diploma designation is Honors in Biomedical Engineering.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.E. in biomedical engineering requires a minimum of 127 hours, distributed as follows:

1. Mathematics (15 hours): MATH 1300, 1301, 2300, 2400.
2. Basic Science (20 hours): CHEM 1601, 1601L, 1602, 1602L; PHYS 1601, 1601L, 1602, 1602L; BSCI 1510, 1510L.
3. Engineering Fundamentals (6 hours): ES 1401, 1402, 1403; CS 1101 or 1103 or 1104.
4. Electrical Engineering (3 hours): EECE 2112.

5. Biomedical Engineering (38 hours): BME 2001, 2002, 2100, 2400, 2900W, 3000, 3301, 3302, 3400, 3500, 3900W, 4901W, 4950, 4951, 4959.
6. Biomedical Engineering electives (12 hours) comprising:
- i) BME courses numbered 2210 and higher (except BME 2860 and designated sections of 3890–3893) to include up to 6 hours total of BME 3860, 3861.
 - ii) Any one of the following: CHBE 4500, 4800, 4805, 4810, 4820, 4840, 4870; EECE 3214, 4353, 4354; ENVE 4610; ME 2220.
7. Technical electives (9 hours) comprising:
- i) Courses in the School of Engineering except BME 2201, 2860, CHBE 3300, CE 2200, CS 1000, 1151, ENGM 2160, 2440, 3100, 3350, ME 2171, and listings in Engineering Science. Up to 3 hours of independent study courses in the School of Engineering may be taken as technical electives.
 - ii) Courses numbered 2000 or higher in the College of Arts and Science listed in the mathematics and natural sciences (MNS) AXLE distribution category except MATH 2610, 2810, 2820, and 3000.
 - iii) BSCI 1511, 1511L; NURS 1500, 1600.
8. Liberal Arts Core (18 hours) to be selected to fulfill the Liberal Arts Core requirements listed under Degree Programs in Engineering.
9. Open electives (6 hours).
- Undergraduates in biomedical engineering may apply the pass/fail option only to courses taken as liberal arts core or open electives, subject to school requirements for pass/fail.

Specimen Curriculum for Biomedical Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
BSCI 1510, 1510L	Introduction to Biological Sciences with Laboratory	4	–
BME 2001, 2002	Systems Physiology I, II	3	3
BME 2100	Biomechanics	–	3
BME 2400	Quantitative Methods I: Statistical Analysis	–	3
BME 2900W	Biomedical Engineering Laboratory I	–	1
EECE 2112	Circuits I	–	3
MATH 2300	Multivariable Calculus	3	–
MATH 2400	Differential Equations with Linear Algebra	–	4
PHYS 1602, 1602L	General Physics with Laboratory II	4	–
	Liberal Arts Core	3	–
		—	—
		17	17
JUNIOR YEAR			
BME 3000	Physiological Transport Phenomena	–	3
BME 3301, 3302	Biomedical Instrumentation I, II	4	4
BME 3400	Quantitative Methods II: Signals and Modeling	3	–
BME 3500	Biomedical Materials	3	–
BME 3900W	Biomedical Engineering Laboratory II	1	–
	Biomedical Engineering and/or Technical Elective	3	6
	Liberal Arts Core	3	3
		—	—
		17	16
SENIOR YEAR			
BME 4901W	Biomedical Engineering Laboratory III	1	–
BME 4950, 4951	Design of Biomedical Engineering Systems I, II	2	3
BME 4959	Senior Engineering Design Seminar	1	–
	Biomedical Engineering and/or Technical Elective	6	6
	Liberal Arts Core	3	3
	Open Elective	3	3
		—	—
		16	15

Course descriptions begin on page 322.

Double Majors

- I. The double major in biomedical and electrical engineering requires a minimum of 129 semester hours. The requirements include those numbered 1, 2, 3, and 8 for the B.E. in biomedical engineering and the following:
 - a. Biomedical engineering (32 hours): BME 2001, 2002, 2100, 2400, 2900W, 3000, 3302, 3500, 3900W, 4901W, 4950, 4951, 4959.
 - b. Biomedical engineering electives (3 hours): BME courses numbered 2210 and higher (except BME 3301, 3400 and designated sections of 3890–3893).
 - c. Electrical engineering (21 hours): EECE 2112, 2123, 2123L, 2213, 2213L, 3214, 3233, 3235, 3235L.
 - d. Electrical engineering electives (15 hours) selected as described by item 6 of the Curriculum Requirements in the

electrical engineering section of the catalog, but totaling at least 15 hours. Students must complete at least two courses in each of two areas of concentration listed under electrical engineering in the Undergraduate Catalog. At least one course must be a domain expertise course as designated in the catalog. BME 3302 may be included toward satisfying the area of concentration requirement but cannot be counted as an electrical engineering elective.

A specimen curriculum for the double major with electrical engineering can be found on the biomedical engineering department's website.

- II. The double major in biomedical and chemical engineering requires a minimum of 137 hours and is described in the chemical engineering section of the catalog under its curriculum requirements.

Chemical Engineering

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 LECTURER Bryan R. Beyer

CHEMICAL engineers play key roles in the development and production of commodity chemicals, pharmaceuticals, and bioengineered materials, high strength composites and specialty polymers, semiconductors and microelectronic devices, and a wide range of ultrapure fine chemicals. Indeed, chemical engineering is essential for the operation of contemporary society. The solutions to many of the problems that we face today—e.g., energy, the environment, development of high-performance materials—will involve chemical engineers.

The undergraduate program in chemical engineering prepares students to contribute to the solution of these and similar problems. Graduates find meaningful careers in industry, in government laboratories, and as private consultants. Some continue their education through graduate studies in chemical engineering, business, law, or medicine.

Mission. The mission of the Department of Chemical and Biomolecular Engineering is to educate those who will advance the knowledge base in chemical engineering, become practicing chemical engineers, and be leaders in the chemical and process industries, academia, and government; to conduct both basic and applied research in chemical engineering and related interdisciplinary areas; and to provide service to the

chemical engineering profession, the School of Engineering, Vanderbilt University, the country, and the world.

Degree Programs. The Department of Chemical and Biomolecular Engineering offers the B.E. in chemical engineering and graduate study leading to the M.Eng., M.S., and Ph.D.

Undergraduate chemical engineering students acquire a solid background in mathematics, chemistry, biology, and physics. The chemical and biomolecular engineering program has as its basis courses in transport phenomena, thermodynamics, separations, and kinetics. Other courses deal with the principles and techniques of chemical engineering analysis and design, along with economic analysis, process control, chemical process safety, and engineering ethics. Laboratory courses offer the student an opportunity to make fundamental measurements of momentum, heat, and mass transport and to gain hands-on experience with bench scale and small scale pilot-plant apparatus, which can be computer controlled. Report writing is a principal focus in the laboratory courses. Many students have the opportunity to carry out individual research projects.

A specimen curriculum for a chemical engineering major follows. This standard program includes a number of electives. Students, in consultation with their faculty advisers, may choose elective courses that maintain program breadth or may pursue a minor or focus area with their chemical engineering major. Specimen curricula with emphases in specific areas are available on the department website. Double majors may be arranged in consultation with a faculty adviser.

The chemical and biomolecular engineering department recommends that students consider taking the Fundamentals of Engineering Examination (FE) in their senior year. This is the first step in obtaining a license as a professional engineer. The following courses are recommended for preparation for the FE: EECE 2112, CE 2200, and ME 2190.

Undergraduate Honors Program. The Honors Program in chemical engineering provides an opportunity for selected students to develop individually through independent study and research. General requirements are described in the Special Programs chapter. The chemical and biomolecular engineering department requires a minimum overall GPA of 3.5. Acceptance to the program is made by petition to the faculty during the junior year. Transfer students may be considered for admission after completing one semester at Vanderbilt. Candidates for honors choose their technical courses with the consent of a faculty honors adviser. Requirements include at least 6 hours of CHBE courses numbered 5000 or above, plus 6 hours of CHBE 3860 and 3861

taken in the junior and/or senior year under the direction of a faculty honors adviser. A formal written research report is submitted each semester CHBE 3860 or 3861 is taken with a final report and presentation given in the spring semester of the senior year to the CHBE faculty and students. The diploma designation is Honors in Chemical Engineering.

Facilities. The chemical and biomolecular engineering department is located in Olin Hall of Engineering. Departmental laboratories are equipped for study of transport phenomena, unit operations, kinetics, and process control. Current research areas for which facilities are available include molecular modeling; adsorption and surface chemistry; biochemical engineering and biotechnology; materials; energy and the environment.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.E. in chemical engineering requires a minimum of 125 hours, distributed as follows:

1. Mathematics (14 hours): MATH 1300, 1301, 2300, 2420.
2. Basic Science (24 hours): CHEM 1601, 1601L, 1602, 1602L, 2221, 2221L, 2222, 2222L; PHYS 1601, 1601L, 1602, 1602L.
3. Engineering Fundamentals (6 hours): ES 1401, 1402, 1403; CS 1101 or 1103 or 1104.
4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
5. Chemical and Biomolecular Engineering (39 hours): CHBE 2100, 2200, 2250, 2900W, 3200, 3250, 3300, 3350, 3600, 3900W, 4900W, 4950W, 4951W, 4959.
6. Science electives (6 hours): BSCI 1510 or CHBE 2150; CHEM 3300 (preferred) or BSCI 2201 or BSCI 2520.
7. Chemical and Biomolecular Engineering electives: 6 hours selected from CHBE courses numbered 4000 and above.
8. Technical electives (6 hours). To be selected from: a) courses numbered 2000 or above in BME, CHBE, CE, CS, EECE, ENVE, ME, MSE, NANO, and SC, except BME 2201, BME 2860, and ME 2220; b) courses numbered 1500 or above in the College of Arts and Science listed in the mathematics and natural sciences (MNS) AXLE distribution category; and c) ENGM 3000, 3010, 3300, 3650, 3700, 4500.

9. Open electives (6 hours).

Undergraduates in chemical engineering, including double majors with chemical engineering, may apply the pass/fail option only to courses taken as open electives, subject to the school requirements for pass/fail. No more than 6 total hours of CHBE 3860 and 3861 may be applied toward degree requirements.

Double Majors

- I. The double major in chemical engineering and biomedical engineering requires a minimum of 137 semester hours. The requirements include those numbered 2, 3, and 4 for the B.E. in chemical engineering and the following:
 - a) Mathematics (15 hours): MATH 1300, 1301, 2300, 2400.
 - b) Biology (4 hours): BSCI 1510, 1510L.
 - c) Chemical and Biomolecular Engineering (29 hours): CHBE 2100, 2200, 2250, 3200, 3250, 3300, 3350, 4900W, 4950W, 4959.
 - d) Biomedical Engineering (32 hours): BME 2001, 2002, 2100, 2900W, 3301, 3302, 3400, 3500, 3900W, 4901W, 4950, 4951, 4959.
 - e) Electrical Engineering (3 hours): EECE 2112.
 - f) CHBE elective: 3 hours selected from CHBE 4500, 4800, 4805, 4810, 4820.
 - g) BME elective: 3 hours selected from BME courses numbered above 2000 except BME 2201, 2400, 2860, 3000, 3200, 6110.
- II. The double major in chemical engineering and chemistry requires a minimum of 130 semester hours. The requirements include those numbered 1, 2, 3, 4, and 7 for the B.E. in chemical engineering and the following:
 - a) Chemical and Biomolecular Engineering (36 hours): CHBE 2100, 2200, 2250, 2900W, 3200, 3250, 3300, 3350, 4900W, 4950W, 4951W, 4959; CHBE 3600 or 4830.
 - b) Science (23 hours): CHEM 2100, 2100L, 3010, 3300, 3315; either CHEM 4965 and 4966 or CHEM 3980, 4980, and 4999; BSCI 1510 or CHBE 2150; BSCI 2520.
 - c) Engineering Elective: 3 hours selected from courses numbered 2000-3800 or 3890 and above in BME, CHBE, CE, EECE, ENVE, and ME, except BME 2201, 2860, and 3830.

Specimen Curriculum for Chemical Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
CHEM 2221, 2222	Organic Chemistry	3	3
CHEM 2221L, 2222L	Organic Chemistry Laboratory	1	1
MATH 2300	Multivariable Calculus	3	–
MATH 2420	Methods of Ordinary Differential Equations	–	3
PHYS 1602, 1602L	General Physics II and Laboratory	4	–
CHBE 2100	Chemical Process Principles	3	–
CHBE 2200	Chemical Engineering Thermodynamics	–	3
CHBE 2250	Modeling and Simulation in Chemical Engineering	–	3
CHBE 2900W	Technical Communications for Chemical Engineers	–	1
	Liberal Arts Core	3	3
		<hr/>	<hr/>
		17	17

		Semester hours	
		FALL	SPRING
JUNIOR YEAR			
CHBE 2150	Molecular and Cell Biology for Engineers	3	–
CHBE 3200	Phase Equilibria and Stage-Based Separations	3	–
CHBE 3250	Chemical Reaction Engineering	–	3
CHBE 3300	Fluid Mechanics and Heat Transfer	3	–
CHBE 3350	Mass Transfer and Rate-Based Separations	–	3
CHBE 3600	Chemical Process Control	3	–
CHBE 3900W	Chemical Engineering Laboratory I	–	3
	Chemical and Biomolecular Engineering Elective	–	3
	Liberal Arts Core	3	3
		<hr/>	<hr/>
		15	15
SENIOR YEAR			
CHBE 4900W	Chemical Engineering Laboratory II	3	–
CHBE 4950W	Chemical Engineering Process and Product Design	4	–
CHBE 4951W	Chemical Engineering Design Projects	–	3
CHBE 4959	Professional Practice of Safety in Chemical Engineering Design	1	–
	Chemical and Biomolecular Engineering Elective	–	3
	Science Elective: CHEM 3300 (preferred), BSCI 2201, or BSCI 2520	3	–
	Liberal Arts Core	–	3
	Technical Elective	3	3
	Open Elective	3	3
		<hr/>	<hr/>
		17	15

Specimen curricula for the double majors with biomedical engineering and with chemistry can be found on the department's website.

Course descriptions begin on page 326.

Civil Engineering

CHAIR Douglas E. Adams
 ASSOCIATE CHAIR Florence Sanchez
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 DIRECTORS OF GRADUATE RECRUITING Hiba Baroud (Civil Engineering), Shihong Lin (Environmental Engineering)
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 ADJUNCT INSTRUCTORS Keith Loiseau, Christopher Prichard, Garrett Rome

VANDERBILT'S Department of Civil and Environmental Engineering offers a broad-based education in civil and environmental engineering fundamentals, coupled with development of leadership, management, and communications skills to establish a foundation for lifelong learning and flexible career development. This goal requires going beyond technical competence in a balanced education to develop future leaders in the fields of consulting, industry, business, law, government, and research. Civil engineers must be able to face complex problems of modern society involving the development of physical facilities that serve the public while protecting the environment and preserving social values. Challenges facing civil and environmental engineers concern housing, urban transportation, pollution control, water resources development, industrial development, maintaining and advancing our nation's aging infrastructure, and exploring space. Addressing these challenges with today's limited resources requires innovative and original ideas from highly-skilled engineers.

Undergraduates majoring in civil engineering receive a strong background in mathematics, science, engineering science, and engineering design. The program also includes courses in economics, humanities, social sciences, resources management, and public policy. Students participate in design teams and laboratory studies as well as classroom activities. Use of various computer-based methods is integral to problem solving and design.

Degree Programs. At the undergraduate level, the Department of Civil and Environmental Engineering offers the B.E. in civil engineering. The curriculum includes upper-level analysis and design courses in structural, geotechnical, environmental, water resources, and transportation engineering. In addition, a major in chemical engineering with a minor in environmental engineering is available.

Vanderbilt's B.E. in civil engineering prepares students for entry-level positions in many specialty areas of civil engineering,

as well as many other types of careers, such as business, construction, and law. Today, however, and even more so in the future, professional practice at a high level will require an advanced degree. We recommend that students seriously consider pursuing the M.S. or M. Eng. soon after obtaining the B.E.

At the graduate level, the department educates leaders in infrastructure and environmental engineering research and practice, with emphasis on the use of reliability and risk management. Reliability and risk management includes engineering design, uncertainty analysis, construction and repair, life-cycle and cost-benefit analysis, information management, and fundamental phenomena intrinsic to the understanding of advanced infrastructure and environmental systems. Example applications include performance, reliability and safety of structures, restoration of contaminated sites, transportation control systems, management of environmental resources, and enhancement of the eco-compatibility of industry. Development and application of advanced information systems as applied to civil and environmental engineering needs is an important part of the program.

The graduate program in civil engineering offers the M.S. and Ph.D., with emphasis in the areas of structural engineering and mechanics and transportation engineering.

The graduate program in environmental engineering offers the M.S. and Ph.D. in the areas of environmental engineering and environmental science, with emphasis in water resources, quality, and treatment; resilience and sustainability; nuclear environmental engineering; and environmental materials and materials durability. Both thesis and non-thesis options are available at the M.S. level.

The graduate programs in both civil engineering and environmental engineering also offer the master of engineering (M.Eng.), an advanced professional degree especially designed for practicing engineers wanting to pursue post-baccalaureate study on a part-time basis, and for engineers seeking greater emphasis on engineering design as part of graduate education.

B.E./M.Eng. Five Year Program. Students seeking advanced study in civil and environmental engineering may be interested in the combined B.E./M.Eng., enabling students to complete the B.E. in civil engineering and M.Eng. in civil engineering or environmental engineering in five years.

Construction Management Five Year Program. Students seeking advanced study in construction management may be particularly interested in the combined B.E./M.Eng., enabling students to complete the B.E. in civil engineering and M.Eng. in civil engineering (construction management emphasis) in five years.

Undergraduate Honors Program. Recognized with the diploma designation Honors in Civil Engineering, exceptional students may be invited in their junior year to participate in the civil engineering Honors Program. Designed as a unique individualized educational experience, participants work closely with departmental faculty members to tailor a selection of courses that actively immerses them in a selected field of study. Experiences include enrollment in a 3 semester hour independent study course and participation in a summer research internship. Honors Program participants are especially well-prepared to enter graduate study, and they may count the independent study course towards their civil engineering technical electives.

Facilities. The civil engineering laboratory provides for static and dynamic testing of materials and structural components and assemblies. Testing facilities include capabilities of testing composites, metals, and concrete under static loads,

fatigue, base acceleration (to simulate seismic events) and intermediate to high speed impacts (to simulate responses to blast events). Full soils testing facilities are available. Hydraulics facilities include several model flow systems to illustrate principles of fluid mechanics and hydrology. The transportation laboratory is computer-based, with emphasis on transportation systems and design, intelligent transportation systems, and geographic information systems.

The environmental laboratories are fully supplied with modern instrumentation for chemical, physical, biological, and radiological analysis of soils, sediments, water, wastewater, air, and solid waste. They include equipment for the study of biological waste treatment, physical-chemical waste treatment, contaminant mass transfer, and state-of-the-art instrumentation for gas and liquid chromatography, mass spectroscopy, atomic absorption spectroscopy, gamma spectroscopy, inductively coupled plasma mass spectroscopy, gas adsorption (for pore structure determination), thermal mechanical analysis, modulated scanning differential calorimetry, and simultaneous thermal gravimetric analysis differential scanning calorimetry/mass spectroscopy. All are available for student use in courses, demonstrations, and research.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.E. in civil engineering requires a minimum of 125 hours, distributed as follows:

1. Mathematics (14 hours). Required courses: MATH 1300, 1301, 2300, 2420.
2. Basic science (12 hours). Required courses: CHEM 1601, 1601L; PHYS 1601, 1601L, 1602, 1602L.
3. Basic science elective (4 hours). To be selected from: (a) Biological Sciences courses numbered 1510 and above; (b) Earth and Environmental Sciences 1030, 1030L, 1510, 1510L, 3250, 3260, 3330, 3340; and (c) Materials Science and Engineering courses except MSE 3851, 3860, 3889, 3890.
4. Computing (3 hours). Required course: CS 1101 or 1103 or 1104.
5. Engineering Fundamentals (26 hours). Required courses: ES 1401, 1402, 1403; CE 2101, 2200, 2205, 3700, 3700L; ENGM 2160; ME 2190; MSE 2205; ME 2220 or CHBE 2200 (students with interests in Environmental and Infrastructure Sustainability Engineering are encouraged to enroll in CHBE 2200).
6. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed under Degree Programs in Engineering.
7. Open electives (6 hours).
8. Technical electives (3 hours). To be selected from: (a) courses in BME, CHBE, CE, ENVE, EECE, ME, and ENGM 3000, 3010, 3200, 3650 (except BME 2201, 2860); (b) all courses acceptable as science electives as indicated above; (c) CHEM 1602 and above; (d) PHYS courses above 2000 (astronomy not accepted); and (e) MATH 2410 or 2600, and courses 2811 and above (except 3000). Students with an interest in Structural Engineering are encouraged to take MATH 2410 or 2600 as their technical elective.
9. Civil Engineering Core (27 hours). Required courses: CE 2120, 3100W, 3200, 3205, 3300, 3501, 3705, 4400, 4950, 4951, and 4959.

10. Civil Engineering Program Electives (6 hours). To be selected from: CE 3250, 3600, 4250, or ENVE 4615.
11. Civil Engineering Design Electives (6 hours). To be selected from: CE 4150, 4200, 4210, 4240, 4250, 4425, 4430, 4500, 4505, 4510; ENVE 4305, 4610, 4625, 4710.

Students may use CE program electives, CE design electives, technical electives, and open electives to gain additional depth and expertise. Students with interests in structural engineering are recommended to take electives such as CE 3250, 4200, 4210, 4211, 4250, 4300, ENVE 4305, and ME 4259, 4275. Students

interested in environmental and infrastructure sustainability engineering are recommended to take electives such as CE 3600, 4100, 4150, 4240, 4300, ENVE 4305, 4600, 4605, 4610, 4615, 4620, 4700, 4705, 4707, 4710, 4715, 4716, and 4720. Specific courses selections should be discussed with their academic adviser. Students desiring advanced topic coverage should also consider 5000-level courses, with approval of their adviser.

Undergraduates in civil engineering may apply the pass/fail option only to courses taken as liberal arts core or open electives, subject to the school requirements for pass/fail.

Specimen Curriculum for Civil Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
MATH 2300	Multivariable Calculus	3	–
PHYS 1602, 1602L	General Physics II and Laboratory	4	–
CE 2101	Civil and Environmental Engineering Information Systems	3	–
CE 2120	Sustainable Design in Civil Engineering	3	–
CE 2200	Statics	3	–
MATH 2420	Methods of Ordinary Differential Equations	–	3
CE 2205	Mechanics of Materials	–	3
CE 3501	Transportation Systems Engineering	–	3
ME 2190	Dynamics	–	3
	Thermodynamics (ME 2220 or CHBE 2200)	–	3
	Liberal Arts Core	–	3
		16	18
JUNIOR YEAR			
CE 3200	Structural Analysis	3	–
CE 3700, 3700L	Fluid Mechanics and Laboratory	4	–
MSE 2205	Strength and Structure of Engineering Materials	1	–
	CE Program Elective	3	–
	Elective*	3	–
	Liberal Arts Core	3	3
CE 3100W	Civil and Environmental Engineering Laboratory	–	2
CE 3205	Structural Design	–	3
CE 3300	Risk, Reliability, and Resilience Engineering	–	3
CE 3705	Water Resources Engineering	–	3
ENGM 2160	Engineering Economy	–	3
		17	17
SENIOR YEAR			
CE 4400	Construction Project Management	3	–
CE 4950	Civil Engineering Design I	1	–
CE 4959	Senior Engineering Design Seminar	1	–
	CE Design Elective	3	3
	Elective*	3	3
	Liberal Arts Core	3	3
CE 4951	Civil Engineering Design II	–	2
	Open Elective	–	3
		14	14

*To be selected toward satisfying the following degree requirements: 6 hours of Program Electives, 3 hours of Technical Electives, and 6 hours of Open Electives.

Pre-Architecture Program

Civil engineering students interested in pursuing architecture at the graduate level should include courses that emphasize a broad sense of art and architectural history, including courses in studio art. Before applying to graduate programs, students will need to develop a portfolio of creative work that generally includes drawing, prints, sculpture, photographs, and creative writing. Further information is available from the pre-architecture advisers: Professor Vesna Pavlović, Department of Art, and Professor Kevin Murphy, Department of History of Art. In addition, the Vanderbilt student club, BLUEprint, seeks to educate and prepare students interested in this field.

Minor in Environmental Engineering

A minor in environmental engineering is available to all non-civil engineering students. It requires a total of 15 hours of environmental engineering courses, comprising 6 hours of required courses and 9 hours of electives, chosen from the following list:

Required Courses (6 hours)

CE 3600 – Environmental Engineering
ENVE 4600 – Environmental Chemistry

Elective Courses (9 hours)

CE 3705 – Water Resources Engineering
CE 4100 – Geographic Information Systems
ENVE 4305 – Enterprise Risk Management
ENVE 4605 – Environmental Thermodynamics, Kinetics, and Mass Transfer
ENVE 4610 – Biological Processes in Environmental Systems
ENVE 4615 – Environmental Assessments
ENVE 4620 – Environmental Characterization and Analysis
ENVE 4625 – Environmental Separations Processes
ENVE 4700 – Energy and Water Resources
ENVE 4705 – Physical Hydrology
ENVE 4710 – Hydrology
ENVE 4715 – Groundwater Hydrology
ENVE 4720 – Surface Water Quality Modeling
ENVE 4800 – Nuclear Environmental Engineering

Minor in Energy and Environmental Systems

The minor in energy and environmental systems is designed to provide students with a working knowledge of the fundamentals of energy systems and their impact on the environment. The future health and well-being of humanity hinge in large part on smart production and use of energy, water, and related resources, as these are central determinants of climate change, habitable space, and human and ecological health. This program examines the relationships among individual, institutional, and societal choices for energy production and use, and the impacts and benefits of these choices on the environment and health through climate, water quality, and natural resources. It requires a total of 15 semester hours of course work, some of which may be taken as electives associated with the student's major program. Five courses are required: two core courses and three elective courses distributed among three areas (at least one course from each of two areas): Area I: Energy Systems, Area II: Environmental Engineering, and Area III: Environmental Survey.

Required Courses (6 hours)

ENVE 4615 – Environmental Assessments
ENVE 4700 – Energy and Water Resources

Elective Courses (9 hours)

Area I: Energy Systems

EECE 4267 – Power System Analysis
ME 3890 – Special Topics: Nuclear Power
ME 4260 – Energy Conversion I

ME 4264 – Internal Combustion Engines

ME 4265 – Direct Energy Conversion

Area II: Environmental Engineering

CE 3600 – Environmental Engineering
CE 3705 – Water Resources Engineering
ENVE 4305 – Enterprise Risk Management
ENVE 4605 – Environmental Thermodynamics, Kinetics, and Mass Transfer
ENVE 4620 – Environmental Characterization and Analysis
ENVE 4710 – Hydrology
ENVE 4800 – Nuclear Environmental Engineering
ME 4262 – Environmental Control

Area III: Environmental Survey

ANTH 4154 – Energy, Environment, and Culture
CE 4100 – Geographic Information Systems
CE 4430 – High Performance and Green Buildings
EES 1080 – Earth and the Atmosphere
EES 2110 – Global Change and Global Issues
PHIL 3611 – Environmental Philosophy
SOC 3315 – Human Ecology and Society

Civil Engineering

Course descriptions begin on page 328.

Environmental Engineering

Course descriptions begin on page 332.

Computer Engineering

DIRECTOR OF UNDERGRADUATE STUDIES W. Timothy Holman

PROFESSORS EMERITI Alfred B. Bonds, Arthur J. Brodersen, James A. Cadzow, J. Michael Fitzpatrick, Kazuhiko Kawamura, Stephen R. Schach

PROFESSORS Bharat L. Bhuvan, Gautam Biswas, Benoit M. Dawant, Aniruddha S. Gokhale, Gábor Karsai, Xenofon D. Koutsoukos, Akos Ledeczki, Lloyd W. Massengill, Padma Raghavan, William H. Robinson, Nilanjan Sarkar, Douglas C. Schmidt, Ronald D. Schrimpf, Janos Sztipanovits

PROFESSOR OF THE PRACTICE Ralph W. Bruce

ASSOCIATE PROFESSORS Robert E. Bodenheimer, Jr., Douglas H.

Fisher, Bennett Landman, Jules White, D. Mitchell Wilkes

ASSISTANT PROFESSORS Matthew Berger, Catie Chang, Abhishek

Dubey, Yuankai Huo, Taylor Johnson, Maithilee Kunda, Jack H. Noble, Ipek Oguz

ASSISTANT PROFESSOR OF THE PRACTICE Graham S. Hemingway

RESEARCH ASSISTANT PROFESSOR Brian D. Sierawski

ADJUNCT ASSISTANT PROFESSOR Andrew Sternberg

THE program in computer engineering deals with the organization, design, and application of digital processing systems as general-purpose computers or as embedded systems, i.e., components of information processing, control, and communication systems. The program provides a strong engineering background centered on digital technology combined with an understanding of the principles and techniques of computer science. Computer engineering is design-oriented. The basic principles of engineering and computer science are applied to the task at hand, which may be the design of a digital processor, processor peripheral, or a complete digital processor-based system. Whatever the undertaking, the comprehensive academic training in this program enables engineers to evaluate

the impact of their decisions, whether working with hardware, software, or the interface between the two.

The computer engineering program combines fundamental core requirements with flexibility to allow students to specialize in a variety of emphasis areas within the program. The curriculum includes requirements in the basic sciences, mathematics, and humanities; a primary core of hardware and software courses; and a set of electives that combine breadth and depth requirements as described below. Students who major in computer engineering who wish to apply for graduate study in electrical engineering or computer science are encouraged strongly to select their elective courses to demonstrate depth in that particular area; the structure of the program enables that option. The course of study leads to a bachelor of engineering.

Undergraduate Honors Program. With faculty approval, junior and senior students may be accepted into the Honors Program. To achieve honors status, the student must:

1. achieve and maintain a minimum GPA of 3.5.
2. complete 3 hours of undergraduate research (EECE 3860, 3861) with final written report.
3. complete 6 hours of EECE program elective credit from the following list:
 - a. up to 3 additional hours of undergraduate research (EECE 3860, 3861), or
 - b. design domain expertise (DE) courses beyond the one course required by the program, or
 - c. 5000-level courses.

The diploma designation is Honors in Computer Engineering.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.E. in computer engineering requires a minimum of 127 hours, distributed as follows:

1. Mathematics (18 hours). Required courses: MATH 1300, 1301, 2300, 2400, 2810
2. Basic Science (16 hours). Required courses: CHEM 1601, 1601L; PHYS 1601, 1601L, 1602, 1602L; MSE 1500, 1500L (or CHEM 1602, 1602L).
3. Engineering Fundamentals (6 hours). Required courses: ES 1401, 1402, 1403, 2100W.
4. Culminating Design Experience (7 hours). Required courses: EECE 4950, 4951, 4959.
5. Computer Engineering Core (at least 23 hours). Required courses: EECE 2112, 2123, 2123L, 2218, 2218L; either EECE 2213 (and 2213L) or 3214; CS 1101 or 1104; CS 2201, 3251.
6. Computer Engineering Electives (18 hours). Defined by a structure that includes the three Computer Engineering Areas of Concentration listed below. Students must complete at least two courses in each of two areas of concentration. Embedded Systems (Area 1) must include EECE 4376, Computing Systems and Networks (Area 2) must include CS 3281 and Intelligent Systems and Robotics (Area 3) must include EECE 4257. Students must complete at least one approved design domain expertise (DE) course as designated below. Other electives from any of the Areas of Concentration or approved undergraduate research (CS 3860; 3861; EECE 3860; 3861) to total 18 hours.

Computer Engineering Areas of Concentration

Embedded Systems

EECE 4257
 EECE 4275
 EECE 4356 (DE)
 EECE 4358 (DE)
 EECE 4376 (DE)
 EECE 4377 (DE)
 EECE 4385 (DE)
 CS 3274 (DE)

Computing Systems and Networks

CS 3265
 CS 3274 (DE)
 CS 3281
 CS 3282 (DE)
 CS 4266 (DE)
 CS 4278 (DE)
 CS 4279 (DE)
 CS 4283 (DE)
 CS 4284 (DE)
 CS 4285
 CS 4288 (DE)
 EECE 4371 (DE)

Intelligent Systems and Robotics

CS 4260
 CS 4269 (DE)
 EECE 4257
 EECE 4353 (DE)
 EECE 4354 (DE)
 EECE 4358 (DE)
 ME 4271

(DE) designates a Design Domain Expertise course

7. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
8. Technical electives (18 hours).
- a. (9-18 hours). At least 9 hours must be taken from this list of approved engineering technical electives.
- BME (except 2201, 2860, 3860, 3861)**
 - CHBE (except 2150, 2900W)
 - CE
 - CS (except 1000, 1101, 1103, 1104, 1151)
 - EECE (hours above basic requirement in sections 5 and 6 above)
 - ENGM 3010
 - ENVE
 - ES 3300
 - ME
 - MSE (except 1500, 1500L)
 - NANO 3000
 - SC 3250, 3260
- b. (0-9 hours). Up to 9 hours may be taken from this list of optional technical electives.
- ENGM 2160, 2210, 3000, 3100, 3300, 3650, 4500
 - MSE 1500, 1500L (if CHEM 1602, 1602L is used for basic science requirement)
 - Astronomy (except 1010, 1111, 2130)
 - Biological Sciences (except 1111)
 - Chemistry (except 1010, 1020, 1601, 1602, 1111)
 - Earth and Environmental Sciences (except 1080, 1111, 2150)
 - Mathematics 2410 and above
 - Neuroscience 2201, 3269, 4961
 - Physics above 2000
 - Psychology 2100, 3780
9. Open Elective (3 hours).
- Undergraduates in computer engineering may apply the pass/fail option only to courses taken as open electives subject to the school requirements for pass/fail.

**Computer engineering majors may earn credit for only one of BME 3300 and BME 3302.

Specimen Curriculum for Computer Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
MATH 2300	Multivariable Calculus	3	–
MATH 2400	Differential Equations with Linear Algebra	–	4
PHYS 1602, 1602L	General Physics II and Laboratory	4	–
EECE 2112	Circuits I	3	–
EECE 2123, 2123L	Digital Systems and Laboratory	4	–
EECE 2218, 2218L	Microcontrollers and Laboratory	–	4
CS 2201	Program Design and Data Structures	3	–
CS 3251	Intermediate Software Design	–	3
	Liberal Arts Core	–	3
	Technical Elective	–	3
		17	17
JUNIOR YEAR			
MATH 2810	Probability and Statistics for Engineering	–	3
ES 2100W	Technical Communications	3	–
EECE 4376, 4376L or CS 3281	Embedded Systems and Laboratory Principles of Operating Systems I	4/3	–
EECE 2213, 2213L or EECE 3214	Circuits II and Laboratory Signals and Systems	4/3	–
	CMPE Program Electives ‡	3	6
	Liberal Arts Core	3	3
	Technical Electives	–	6
		15-17	18
SENIOR YEAR			
EECE 4950	Program and Project Management for EECE	3	–
EECE 4951	Electrical and Computer Engineering Design	–	3
EECE 4959	Senior Engineering Design Seminar	1	–
	CMPE Program Electives ‡	3	3
	Liberal Arts Core	3	3
	Technical Electives	6	3
	Open Electives	–	3
		16	15

‡ As described in "Computer Engineering Degree Requirements" subsection 6. At least one design domain expertise (DE) course required prior to EECE 4951.

Minor in Computer Engineering

The minor in computer engineering is available to all students except those majoring or minoring in electrical engineering or computer science. The computer engineering minor requires a minimum of 17 hours of EECS courses, including the completion of all laboratory corequisites for courses selected for the minor, distributed as follows:

- | | |
|---|--------------------|
| 1. Programming: CS 1101 or 1104 | 3 hours |
| 2. Digital Systems: EECE 2123, 2123L | 4 hours |
| 3. Microcontrollers: EECE 2218, 2218L | 4 hours |
| 4. EECE 2112 or CS 2201 or CS 2204 | 3 hours |
| 5. At least 3 hours of EECE or CS courses numbered 2000 or above (excluding EECE 3860, 3861 or CS 3860, 3861) | 3 hours |
| Total: | 17–18 hours |

Computer Science

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 ADJUNCT ASSISTANT PROFESSORS Daniel Balasubramanian, Zhiao Shi
 LECTURERS Dominique Plot, Edward Stringfellow, Peter Volgyesi

THE program in computer science blends scientific and engineering principles, theoretical analysis, and actual computing experience to provide undergraduate students with a solid foundation in the discipline. Emphasis is on computing activities of both practical and intellectual interest, and on theoretical studies of efficient algorithms and the limits of computation. Computer facilities are available for class assignments, team projects, and individual studies. Students are challenged to seek original insights throughout their study. Working in teams, participating in summer internships, supporting student professional organizations, and developing interdisciplinary projects are strongly encouraged.

The computer science major provides an excellent background for medical studies, and the flexibility provided by its many open electives allows students to prepare for medical school while earning a degree in computer science with a normal load in four years. Interested students should discuss their plans with

their computer science adviser in the fall of their first year.

In addition to the bachelor of science, the master of science and doctor of philosophy are also awarded in computer science. Many students choose to double major in mathematics.

Undergraduate Honors Program. The Honors Program provides recognition for select undergraduates who have experienced advanced study in computer science. Students who have an overall GPA of 3.5 or better, a GPA of 3.5 or better in computer science classes, and six hours of any combination of undergraduate research (CS 3860 and 3861) and 6000-level courses will be granted honors in the computer science program. The diploma designation is Honors in Computer Science.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.S. in computer science requires a minimum of 120 hours, distributed as follows:

- Mathematics (20–22 hours). Required components:
 - Calculus/Linear algebra (14–16 hours). A sequence selected from the following:
 - MATH 1200, 1201, 1301, 2300, and one of 2410 or 2600,
 - MATH 1300, 1301, 2300, and one of 2410 or 2600, or
 - MATH 1300, 1301, 2500, 2501
 - Statistics/Probability (3 hours): MATH 2810, 2820, or 3640.
 - Elective course (3 hours). To be selected from MATH 2420 or courses numbered 2610 or higher.
- Science (12 hours). To be selected from the following list and include at least one laboratory course: BSCI 1100, 1100L, 1510, 1510L, 1511, 1511L, 2218, 2219; CHEM 1601, 1601L, 1602, 1602L; Earth and Environmental Sciences 1510, 1510L; MSE 1500, 1500L; PHYS 1601, 1601L, 1602, 1602L. Recommended: CHEM 1601, 1601L; PHYS 1601, 1602.
- Introduction to Engineering (3 hours): ES 1401, 1402, 1403.
- Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
- Computer Science Core (25 hours).

Software/Problem Solving: CS 1101 or 1104, and CS 2201, 3251, 3270.

Hardware/Systems: EECE 2123, 2123L, CS 3281.

Foundations: CS 2212, 3250.
- Computer Science Depth (12 hours). To include at least one course selected from CS 4260 or 4278. Remaining hours to be selected from computer science courses numbered 3000 or higher; EECE 4353, 4354, 4376, and no more than two from MATH 3320, 3620, 4600, 4620. A maximum of 6 hours may come from CS 3860, 3861.
- Computer Science Project (3 hours). To be selected from CS 3259, 3892, 4269, 4279, 4287.
- Computer Science Seminar (1 hour). CS 4959.
- Technical Electives (6 hours). To be selected from courses numbered 2000 or higher within the School of Engineering (except BME 2860, ENGM 2440, ENGM 4800, ES 2700, ES 3884, and CS courses numbered below 3000); or courses

numbered 2000 or higher in the College of Arts and Science listed in the mathematics and natural science (MNS) AXLE distribution requirements. Students are encouraged to note the two-course sequence EECE 4950-4951.

10. Open Electives (18–20 hours).
11. Computers and Ethics (3 hours) CS 1151. May be used to satisfy three hours from the Liberal Arts Core (#4) or Open Electives (#10). May not be taken on a pass/fail grading basis by CS majors or minors.

12. Writing Component. At least one “W”-designated course or 1111 course in the English Language must be included from the Liberal Arts Core (#4), Technical Electives (#9), or Open Electives (#10).

Undergraduates in computer science may apply the pass/fail option only to courses taken as open electives, technical electives, or part of the liberal arts core, subject to the school requirements for pass/fail.

Specimen Curriculum for Computer Science

		Semester hours	
		FALL	SPRING
FIRST YEAR			
CHEM 1601, 1601L	General Chemistry and Laboratory	4	–
PHYS 1601, 1601L	General Physics I and Laboratory	–	4
MATH 1300	Accelerated Single-Variable Calculus I	4	–
MATH 1301	Accelerated Single-Variable Calculus II	–	4
ES 1401-1403	Introduction to Engineering	3	–
CS 1101	Programming and Problem Solving	–	3
	Liberal Arts Core	–	3
	Open Electives	3	–
		—	—
		14	14
SOPHOMORE YEAR			
PHYS 1602, 1602L	General Physics II and Laboratory	4	–
MATH 2300	Multivariable Calculus	–	3
EECE 2123, 2123L	Digital Systems and Laboratory	4	–
CS 2201	Program Design and Data Structures	3	–
CS 2212	Discrete Structures	–	3
CS 3251	Intermediate Software Design	–	3
	Liberal Arts Core	–	3
	Open Electives	3	3
		—	—
		14	15
JUNIOR YEAR			
MATH 2410	Methods of Linear Algebra	–	3
MATH 2820	Introduction to Probability and Mathematical Statistics	3	–
CS 3250	Algorithms	–	3
CS 3270	Programming Languages	3	–
CS 3281	Principles of Operating Systems I	3	–
	Computer Science Depth	–	3
	Liberal Arts Core	3	3
	Open Electives (ES 2100W recommended)	5	3
		—	—
		17	15
SENIOR YEAR			
CS 4959	Computer Science Seminar	1	–
	Computer Science Project	–	3
	Computer Science Depth	6	3
	Mathematics Elective	3	–
	Technical Electives	3	3
	Liberal Arts Core	3	3
	Open Electives	–	3
		—	—
		16	15

Second Major in Computer Science for Non-Engineering Students

The second major in computer science for students enrolled outside the School of Engineering requires 40 hours distributed according to items 5, 6, and 7 of the curriculum requirements listed above.

Courses taken toward the second major may not be taken pass/fail.

Computer Science Minor

The minor in computer science requires 15–16 hours of computer science courses as follows:

1. Programming: CS 1101 or 1104	3 hours
2. Discrete Structures: CS 2212	3 hours
3. Intermediate Computer Concepts: CS 2201	3 hours
4. EECE 2123 (and 2123L), or CS 3250, or CS 3251	3–4 hours
5. One additional CS course numbered 3000 or above	3 hours
Total:	15–16 hours

Course descriptions begin on page 334.

Electrical Engineering

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ADJUNCT ASSISTANT PROFESSOR Andrew L. Sternberg

ADJUNCT INSTRUCTOR John Beck

THE electrical engineer has been primarily responsible for the information technology revolution that society is experiencing. The development of large-scale integrated circuits has led to the development of computers and networks of ever-increasing capabilities. Computers greatly influence the methods used by engineers for designing and problem solving.

The curricula of the electrical engineering and computer engineering majors are multifaceted. They provide a broad foundation in mathematics, physics, and computer science and a traditional background in circuit analysis and electronics.

Several exciting areas of concentration are available, including microelectronics, computer systems, robotics and control systems, and signal processing. Double majors may be arranged with some programs, including biomedical engineering and mathematics. Students receive an education that prepares them for diverse careers in industry and government and for post-graduate education.

Undergraduate Honors Program. With faculty approval, junior and senior students may be accepted into the Honors Program. To achieve honors status, the student must:

1. achieve and maintain a minimum GPA of 3.5.
2. complete 3 hours of undergraduate research (EECE 3860, 3861) with final written report.
3. complete 6 hours of EECE program elective credit from the following list:
 - a. up to 3 additional hours of undergraduate research (EECE 3860, 3861), or
 - b. design domain expertise (DE) courses beyond the one course required by the program, or
 - c. 5000-level courses.

The diploma designation is Honors in Electrical Engineering.

Facilities. Electrical and computer engineering supports undergraduate laboratories emphasizing the principal areas of the disciplines: analog and digital electronics, microcomputers, microprocessors, microelectronics, and instrumentation. In addition, several specialized facilities are available for graduate research: the advanced carbon nanotechnology and diamond labs, the Institute for Software Integrated Systems, the Institute for Space and Defense Electronics, the Medical Image Processing Laboratory, the Center for Intelligent Systems and Robotics Laboratories, the Embedded Computer Systems Laboratory, and biomedical, biosensing, and photonics laboratories.

The work in electrical and computer engineering is supported by a variety of computers and networks, including the high-performance computing facilities of the Advanced Computing Center for Research and Education. Vanderbilt is one of the founding partners in the Internet II initiative.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.E. in electrical engineering requires a minimum of 128 hours, distributed as follows:

1. Mathematics (18 hours). Required courses: MATH 1300, 1301, 2300, 2400, 2810.
2. Basic Science (16 hours). Required courses: CHEM 1601, 1601L; PHYS 1601, 1601L, 1602, 1602L; MSE 1500, 1500L or CHEM 1602, 1602L.
3. Engineering Fundamentals (6 hours). Required courses: ES 1401, 1402, 1403, ES 2100W.
4. Culminating Design Experience (7 hours). Required courses: EECE 4950, 4951, 4959.
5. Electrical Engineering Core (24 hours). Required courses: CS 1101 or 1104; EECE 2112, 2123, 2123L, 2213, 2213L, 3214, 3233, 3235, 3235L.

6. Electrical Engineering Electives (18 hours). Defined by a structure that includes the five Electrical Engineering Areas of Concentration listed below. Students must complete at least two courses in each of two concentration areas. Students must complete at least one approved design domain expertise (DE) course as designated below. Other EECE electives to total 18 hours.

Electrical Engineering Areas of Concentration

Computer Engr.	Microelectronics	Signal/Image Processing	Robotics	Networking and Comm.
EECE 2218	EECE 4275	EECE 4252	EECE 4257	EECE 4252
EECE 4275	EECE 4283	EECE 4286	EECE 4354 (DE)	EECE 4334 (DE)
EECE 4356 (DE)	EECE 4284	EECE 4334 (DE)	EECE 4358 (DE)	EECE 4371 (DE)
EECE 4376 (DE)	EECE 4288	EECE 4353 (DE)	ME 4271	
EECE 4377 (DE)	EECE 4380 (DE)	EECE 4354 (DE)		
EECE 4385 (DE)	EECE 4385 (DE)	EECE 4356 (DE)		
CS 3274 (DE)	BME 3300 or 3302**	CS 3258		
ME 4271		BME 3300 or 3302**		
		BME 3600		

(DE) designates a Design Domain Expertise course

**Electrical engineering majors may earn credit for only one of BME 3300 or 3302.

7. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
8. Technical electives (18 hours).
- a. (9–18 hours). At least 9 hours must be taken from this list of approved engineering technical electives.
- BME (except 2201, 2860, 3860, 3861)
 - CHBE (except 2150, 2900W)
 - CE
 - CS (except 1000, 1101, 1103, 1104, 1151)
 - EECE (above basic requirement in sections 5 and 6 above)
 - ENGM 3010
 - ENVE
 - ES 3300
 - ME
 - MSE (except 1500, 1500L)
 - NANO 3000
 - SC 3250, 3260
- b. (0–9 hours). Up to 9 hours may be taken from this list of optional technical electives.
- ENGM 2160, 2210, 3000, 3100, 3300, 3650, 4500
 - MSE 1500, 1500L (if CHEM 1602, 1602L is used for basic science requirement)
 - Astronomy (except 1010, 1111, 2130)
 - Biological Sciences (except 1111)
 - Chemistry (except 1010, 1020, 1601, 1602, 1111)
 - Earth and Environmental Sciences (except 1080, 1111, 2150)
 - Mathematics 2410 and above
 - Neuroscience 2201, 3269, 4961
 - Physics above 2000
 - Psychology 2100, 3780
9. Open Elective (3 hours).

Double majors have special curricula that require more than 128 hours and a different distribution of electives. See the EECS webpage or the EECE double major adviser for these curricula.

A double major in electrical engineering and biomedical engineering is offered as a unitary BME-EE curriculum, which is described in the Biomedical Engineering section of the catalog under its curriculum requirements. It requires a minimum of 129 semester hours.

Undergraduates in electrical engineering, including double majors in electrical engineering, may apply the pass/fail option only to courses taken as open electives subject to the school requirements for pass/fail.

General Engineering

DIRECTOR Yiorgos Kostoulas,
 PROFESSORS OF THE PRACTICE Yiorgos Kostoulas, David A. Owens,
 Kenneth R. Pence, Christopher J. Rowe
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 ADJUNCT INSTRUCTOR Julie S. Birdsong
 ADJOINT PROFESSORS OF THE PRACTICE: John A. Bers, J. Caleb
 Clanton

THE Division of General Engineering administers the engineering science major, the engineering management minor, and the first-year introduction to engineering course. The division oversees non-traditional engineering study and advises students on course selection to meet specific career goals that traditional engineering majors may not provide.

Engineering Science Major (Bachelor of Science)

The engineering science major is flexible and interdisciplinary—offering students the opportunity to select a program of study to meet special interests or objectives. Many students choose a program of study in engineering management, communication of science and technology, various engineering concentrations, environmental science or materials science; however, students may develop unique plans of study to specialize in areas for which facilities and faculty competence exist but which are not covered within a single existing degree program at Vanderbilt. Engineering science graduates may establish careers in engineering or science, interface with engineers (e.g., in marketing and sales), or use their analytical and problem-solving skills to build future professional careers. Defined areas of concentration exist in engineering management, communication of science and technology, secondary education, and materials science and engineering. Individual programs have been developed for students interested in careers in engineering mathematics, environmental engineering, transportation engineering, teaching, technical communications, and other areas requiring nontraditional combinations of engineering courses. Because of the flexible nature of the engineering science programs of study, accreditation has not been sought for these programs of study, and engineering science majors will not qualify for engineering licensure in most states.

Engineering Management. Engineering management is an interdisciplinary program of study designed to give students the tools to manage technology development and innovation, to enhance manufacturing quality and productivity in a competitive international environment, and to implement these objectives successfully in an organization. Engineering management links engineering, science, and the management disciplines. In addition to the core science and math courses required of all engineering students, topics of study include entrepreneurship, human resources management, finance in technology-based organizations, technology strategy, communications, and operations.

Communication of Science and Technology. Many careers that are attractive to graduates of the engineering science program require the communication of engineering and science to people who are not technically trained. The Communication of Science and Technology interdisciplinary program prepares engineering students for careers in areas such as technical consulting, high-technology marketing and sales, environmental law, and journalism. The program combines traditional

engineering and science courses with communications and humanities courses in a flexible curriculum. Engineering science majors may select from a set of program electives identified by the faculty committee of the School of Engineering and the College of Arts and Science that supervises the program.

Minors. Students may also pursue a minor consisting of at least five courses of at least three credit hours within a recognized area of knowledge. Minors are offered in engineering management, materials science and engineering, computer engineering, electrical engineering, computer science, scientific computing, environmental engineering, energy and environmental systems, nanoscience and nanotechnology, and most disciplines within the College of Arts and Science. Students must declare their intention to pursue minors by completing forms available in the Office of Academic Services of the School of Engineering.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.S. in engineering science requires a minimum of 121 hours, distributed as follows:

1. Basic Science (16 hours). CHEM 1601, 1601L plus 12 hours from BSCI 1510, 1510L, 1511, 1511L; CHEM 1602, 1602L; PHYS 1601, 1601L, 1602, 1602L; or MSE 1500, 1500L with two courses in a single discipline.
2. Mathematics (14 hours). MATH 1300, 1301, 2300 and 3 hours to be selected from mathematics courses numbered 2400 and above.
3. Engineering (43 hours).
 - a) Engineering Fundamentals (12 hours): CS 1101 or 1103 or 1104; ES 1401, 1402, 1403, 2100W; ENGM 3700.
 - b) Engineering Core (12 hours): To be selected from courses in any of the following disciplines: BME, CHBE, CE, CS, EECE, ENVE, MSE, ME, NANO, SC (except BME 1105, 2201, 2860; CS 1000, 1151).
 - c) Engineering Electives (15 hours): To be selected from any Engineering School courses (including ES and ENGM), except BME 1105, 2201, 2860; CS 1000, 1151; ES 1115, 2700, 3884; ENGM 2440, 4800.
 - d) Senior Capstone (4 hours): ES 4951, ES 4959.
4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed under Degree Programs in Engineering.
5. Open Electives (6 hours).
6. Program Concentration (24 hours). In consultation with the academic adviser, each student must identify a meaningful sequence of courses, not counting certain introductory-level courses, that directly contributes to meeting stated career goals. Program concentrations are approved by the academic adviser and the program director in advance and become part of the student's degree audit.

The preparation provided by this 24-hour package, together with a solid foundation in basic engineering courses, provides the engineering science student a strong and useful career base.

No more than 24 credit hours of business-related course work (BUS, ENGM, FNEC, MGRL) may be applied to the ES degree program. Only one business-related minor (BUS, ENGM, FNEC,

MGR, HOD) may count to a student's academic program. Credit for only one of CS 1101 or 1104 may be applied to the ES degree program.

Undergraduates in engineering science may apply the pass/ fail option only to courses taken as liberal arts core or open electives, subject to the school requirements for pass/fail. UNIV courses are eligible for open elective credit only.

Course descriptions begin on page 343.

Engineering Management Minor

Engineering management is an interdisciplinary program of study designed to expose engineering students to the concepts and theories of the management of the engineering function, the critical elements of technology development and innovation, and the implementation of such ideas in manufacturing, engineering, and technology environments. Approximately two-thirds of all engineers spend a substantial portion of their professional careers as managers. In the complex, competitive world of technology-driven industry, skilled engineers who understand the essential principles of management and business have a competitive advantage.

The program in engineering management prepares students to work effectively in developing, implementing, and modifying technologies and systems. The ability to manage and administer large technical engineering and research projects and budgets will continue to challenge engineering management skills.

The engineering management minor is designed to provide a working knowledge of the fundamentals of management and innovation.

The minor program consists of 15 hours of course work, some of which may be taken as electives associated with the student's major program. Five courses are required: four core courses and the remaining course chosen from a list of electives.

Program Requirements

The student must take the following four courses:

- ENGM 2210 Technology Strategy
- ENGM 2440 Applied Behavioral Science
- ENGM 3000 Enterprise Systems Design OR
- ENGM 3010 Systems Engineering
- ENGM 3700* Program and Project Management

The student must select one of the following courses:

- ENGM 2160 Engineering Economy
- ENGM 3100 Accounting and Finance for Engineers
- ENGM 3200 Technology Marketing
- ENGM 3300 Technology Assessment and Forecasting
- ENGM 3350 Organizational Behavior
- ENGM 3600 Technology-Based Entrepreneurship
- ENGM 3650 Operations and Supply Chain Management
- ENGM 4500 Product Development
- CE 4300 Reliability and Risk Case Studies
- ENVE 4305 Enterprise Risk Management
- ES 2900 Engineering and Public Policy

* Students majoring in civil or electrical engineering may substitute CE 4400 or EECE 4950 for ENGM 3700.

Course descriptions begin on page 341.

Materials Science and Engineering

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MATERIALS are now, and have often been, at the heart of the solutions to many of society's problems. Many of the barriers to widespread incorporation of alternate and renewable energy, from higher-capacity, more robust, less expensive batteries for energy storage, to high efficiency/low cost solar devices, involve the need for new materials. Materials will play a large role in the area of health care. New medical devices, drug delivery systems, and synthetic biological tissue are just a few of the health-related applications in need of new materials for their success. In addition, materials challenges are front and center in the ever-evolving areas of electronic devices. Engineers and scientists with knowledge of materials science and engineering concepts are needed to address these and many more materials challenges.

Materials science and engineering is an interdisciplinary program with affiliated faculty from all of the engineering disciplines, as well as faculty from chemistry, and physics. Two undergraduate options involving materials science and engineering are available. Students pursuing a B.S. in engineering science may choose a program concentration in materials science and engineering. This option requires the student to take MSE 1500, 1500L, and 2500, and other materials science and engineering elective courses to complete their 27 hours of engineering program electives. Students pursuing a B.E. in an engineering discipline can earn a minor in materials science and engineering.

Materials Science and Engineering Minor

The minor in materials science and engineering provides the student with an understanding of engineering materials. It complements and adds to the student's major in one of the engineering disciplines, exposing the student to an interdisciplinary approach to problem solving. The minor program in materials science and engineering requires 16 hours of program courses,

of which 7 hours are devoted to MSE 1500, 1500L and MSE 2500. No more than 10 hours below the 2500 level may be applied to the minor.

Program Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

MSE 1500, 1500L Materials Science I and Laboratory
MSE 2500 Materials Science II

The remaining 9 hours can be chosen from the following list of courses.

MSE 3860 Undergraduate Research
MSE 3889-3890 Special Topics
BME 2100 Biomechanics
BME 2200 Biomedical Materials: Structure, Property, and Applications
BME 4200 Principles and Applications BioMicroElectroMechanical Systems (BioMEMS)
BME 4500 Nanobiotechnology
CHBE 4840 Applications of Nanostructures
CHBE 4850 Semiconductor Materials Processing
CHBE 4860 Molecular Aspects of Chemical Engineering
CHBE 4870 Polymer Science and Engineering
CHBE 4880 Corrosion Science and Engineering
CE 2205 Mechanics of Materials
CE 3205 Structural Design
CE 4200 Advanced Structural Steel Design
CE 4210 Advanced Reinforced Concrete Design
CE 4211 Mechanics of Composite Materials
EECE 4283 Principles and Models of Semiconductor Devices
EECE 4284 Integrated Circuit Technology and Fabrication
ME 3202 Machine Analysis and Design
ME 4251 Modern Manufacturing Processes
ME 4275 Finite Element Analysis
CHEM 3010 Inorganic Chemistry
CHEM 3300 Physical Chemistry: Quantum Mechanics, Spectroscopy, and Kinetics
CHEM 3630 Macromolecular Chemistry: Polymers, Dendrimers, and Surface Modification
PHYS 2250W Introduction to Quantum Physics and Applications I
PHYS 2290 Electricity, Magnetism, and Electrodynamics
PHYS 3640 Physics of Condensed Matter

Course descriptions begin on page 344.

Mechanical Engineering

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ADJOINT ASSISTANT PROFESSOR Carl A. Hall

THE vitality of our nation depends upon innovation in the design of new machines, devices to satisfy society's needs, engines to produce power efficiently, equipment to condition the environment of our buildings, and the systems to use and control these engineered products. Mechanical engineers are involved in solving problems by originating design concepts, developing products and processes of manufacture, and designing hardware and the systems needed to satisfy society's demands. Mechanical engineers work in virtually all industries.

The study of mechanical engineering requires a basic understanding of mathematics, chemistry, physics, and the engineering sciences. Mechanical engineering education emphasizes solid mechanics; dynamics of machines; aerodynamics; propulsion devices; material behavior; power producing and environmental conditioning processes; control of dynamics of machines; energy conversion; and the synthesis, development, evaluation, and optimization of designs of devices and systems.

Degree Programs. The Department of Mechanical Engineering offers the B.E., M.Eng., M.S., and Ph.D. in mechanical engineering.

The curriculum in mechanical engineering leading to a bachelor of engineering provides a broad-based engineering education with opportunities for the student to elect courses in areas of study related to any industry and, with careful planning of the elective courses, to achieve some specialization. The mechanical engineering program prepares an individual to become a practicing engineer who can participate fully in the engineering activities of design, building, operation, production, maintenance, safety, marketing, sales, research, and administration.

Undergraduate Honors Program. See the Special Programs chapter for general requirements of the professional Honors Program in mechanical engineering. Honors candidates choose their technical elective courses with the advice and consent of an honors adviser. Each candidate is expected to take 3 hours of ME 3860 in a single semester and at least 6

hours of graduate courses numbered 5000 or higher, including one course numbered 8000 or higher. A formal written honors thesis on the candidate's research must be approved by the honors adviser and the department chair. Honors candidates shall meet all Engineering School requirements in the nontechnical areas. The diploma designation is Honors in Mechanical Engineering.

Facilities. Undergraduate instructional laboratories are equipped for studies in heat and power, refrigeration and air-conditioning, fluid flow, heat transfer, design, controls, robotics, instrumentation, and biomechanics. Specialized facilities for robotic surgery, rehabilitation robotics, energy storage, medical microfluidics, thermal transport, combustion characterization, and photonics are used for both faculty-led research and instruction. The department also maintains various maker spaces including machine shops and design studios for fabrication of experimental equipment and for instruction.

Curriculum Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The B.E. in mechanical engineering requires a minimum of 126 hours, distributed as follows:

1. Mathematics (17 hours). Required courses: MATH 1300, 1301, 2300, 2420. Required elective: one from courses numbered 2410 and above, except 3000.
2. Basic Science (16 hours). Required courses: CHEM 1601, 1601L; MSE 1500, 1500L (or CHEM 1602, 1602L); PHYS 1601, 1601L, 1602, 1602L.
3. Engineering Science (25 hours). Required courses: ES 1401, 1402, 1403; CE 2200, 2205; CS 1101 or 1103 or 1104; EECE 2112; ME 2190, 2220, 3224; MSE 2205.

4. Liberal Arts Core (18 hours). To be selected to fulfill the Liberal Arts Core requirements listed in the Degree Programs in Engineering.
5. Open electives (6 hours).
6. ME core (26 hours). ME 2160, 2171, 3202, 3204, 3234, 3248, 4213, 4950, 4951, and 4959
7. Technical electives (9 hours). To be selected from the following approved courses. Courses selected from the College of Arts and Science must be designated a Mathematics and Natural Sciences (MNS) course in the AXLE curriculum.
 - a) Engineering courses except BME 2201, 2860; CS 1000, 1151; ENGM 2440, 3350, 4800; ES 2700, 2900, 3884.
 - b) Mathematics courses numbered 2420 or higher except MATH 3000
 - c) Chemistry courses numbered 2000 or higher
 - d) Physics courses numbered 2000 or higher
 - e) Astronomy courses
 - f) Biological Science courses
 - g) Earth and Environmental Science courses
 - h) Neuroscience courses

At least 3 hours must be numbered 2000 or above.

8. Professional (ME) depth (a minimum of 9 hours). Each student must choose at least 9 hours of ME elective courses. No more than 6 hours of 3850 and 3860 combined can be credited toward ME depth electives.

No one-credit-hour ME course except 3841 can be used as a mechanical engineering elective. A maximum of three one-credit-hour ME courses may be used as technical electives. Additional ME one-credit-hour courses can be open electives. At least one "W"-designated course in the English language must be included on a graded basis.

Undergraduates in mechanical engineering may apply the pass/fail option only to non-departmental courses taken as open electives, technical electives, or part of the liberal arts core, subject to the school requirements for pass/fail.

Specimen Curriculum for Mechanical Engineering

		Semester hours	
		FALL	SPRING
SOPHOMORE YEAR			
ME 2160	Introduction to Mechanical Engineering Design	3	–
MATH 2300	Multivariable Calculus	3	–
MATH 2420	Methods of Ordinary Differential Equations	–	3
PHYS 1602, 1602L	General Physics II and Laboratory	4	–
CE 2200	Statics	3	–
ME 2171	Instrumentation Laboratory	–	2
ME 2190	Dynamics	–	3
ME 2220	Thermodynamics	–	3
EECE 2112	Circuits I	–	3
	Liberal Arts Core	3	3
		<hr/>	<hr/>
		16	17

		Semester hours	
		FALL	SPRING
JUNIOR YEAR			
ME 3202	Machine Analysis and Design	3	–
ME 3204	Mechatronics	–	3
ME 3224	Fluid Mechanics	3	–
ME 3234	System Dynamics	4	–
ME 3248	Heat Transfer	–	3
CE 2205	Mechanics of Materials	3	–
MSE 2205	Strength and Structure of Engineering Materials	1	–
	Mechanical Engineering Elective	–	3
	Open Elective	–	3
	Liberal Arts Core	3	–
	Mathematics Elective	–	3
		17	15
SENIOR YEAR			
ME 4213	Energetics Laboratory	2	–
ME 4950	Design Synthesis	2	–
ME 4951	Engineering Design Projects	–	3
ME 4959	Senior Engineering Design Seminar	1	–
	Mechanical Engineering Elective	3	3
	Liberal Arts Core	3	3
	Technical Elective	6	3
	Open Elective	–	3
		17	15

Course descriptions begin on page 344.

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 Undergraduate School Catalog

Nanoscience and Nanotechnology

DIRECTORS Paul E. Laibinis, Sandra J. Rosenthal

Affiliated Faculty

PROFESSORS David E. Cliffl (Chemistry), Peter T. Cummings (Chemical and Biomolecular Engineering), Craig L. Duvall (Biomedical Engineering), Philippe M. Fauchet (Electrical Engineering), Daniel M. Fleetwood (Electrical Engineering), Kenneth F. Galloway (Electrical Engineering), Todd D. Giorgio (Biomedical Engineering), Scott A. Guelcher (Chemical and Biomolecular Engineering), Richard F. Haglund, Jr. (Physics), Timothy P. Hanusa (Chemistry), Frederick R. Haselton (Biomedical Engineering), G. Kane Jennings (Chemical and Biomolecular Engineering), Michael R. King (Biomedical Engineering), Paul E. Laibinis (Chemical and Biomolecular Engineering), Deyu Li (Mechanical Engineering), Clare M. McCabe (Chemical and Biomolecular Engineering), Sokrates T. Pantelides (Physics), Peter N. Pintauro (Chemical and Biomolecular Engineering), Cynthia A. Reinhart-King (Biomedical Engineering), Sandra J. Rosenthal (Chemistry), Ronald D. Schrimpf (Electrical Engineering), Norman H. Tolk (Physics), Kalman Varga (Physics), Sharon M. Weiss (Electrical Engineering), John P. Wikswo, Jr. (Physics), David W. Wright (Chemistry)

ASSOCIATE PROFESSORS Joshua D. Caldwell (Mechanical Engineering), Bridget R. Rogers (Chemical and Biomolecular Engineering), Florence Sanchez (Civil Engineering), Jason G. Valentine (Mechanical Engineering), Greg Walker (Mechanical Engineering), Yaqiong Xu (Physics)

ASSISTANT PROFESSORS Rizia Bardhan (Chemical and Biomolecular Engineering), Leon Bellan (Mechanical Engineering), Kelsey B. Hatzell (Mechanical Engineering), Piran Kidambi (Chemical and Biomolecular Engineering), Janet E. MacDonald (Chemistry), Justus C. Ndukaife (Electrical Engineering), Cary L. Pint (Mechanical Engineering), Carlos A. Silvera Batista (Chemical and Biomolecular Engineering), John T. Wilson (Chemical and Biomolecular Engineering)

RESEARCH ASSOCIATE PROFESSORS Anthony B. Hmelo (Physics), James R. McBride (Chemistry)

RESEARCH ASSISTANT PROFESSORS Dmitry Koktysh (Chemistry), Alice Leach (Materials Science)

FACULTY in the School of Engineering and the College of Arts and Science offer an interdisciplinary minor in nanoscience and nanotechnology. The minor is administered by the School of Engineering.

Nanoscience and nanotechnology are based on the ability to synthesize, organize, characterize, and manipulate matter systematically at dimensions of ~1 to 100 nm, creating uniquely functional materials that differ in properties from those prepared by traditional approaches. At these length scales, materials can take on new properties that can be exploited in a wide range of applications such as for solar energy conversion, ultra-sensitive sensing, and new types of vaccines. These activities require the integration of expertise from various areas of science and engineering, often relying on methods of synthesis, fabrication, and characterization that are beyond those encountered in an individual course of study.

Students who minor in nanoscience and nanotechnology learn the principles and methods used in this rapidly growing field. Its core originates in the physical sciences by providing key approaches for describing the behavior of matter on the nanoscale. Synthetic approaches are used to manipulate matter systematically, for creating uniquely functional nanomaterials that can be inorganic, organic, biological, or a hybrid of these. With a third component of characterization, a process for designing systems to have particular properties as a result of their composition and nanoscale arrangement emerges. Students are introduced to these

areas through foundational and elective courses for the minor that are specified below, the latter of which can be selected to fulfill the degree requirements for their major.

The minor in nanoscience and nanotechnology is supported by the Vanderbilt Institute of Nanoscale Science and Engineering (VINSE) that brings together faculty from the College of Arts and Science, the School of Engineering, and the Medical Center. A specialized laboratory facility maintained by VINSE provides students in the minor with capstone experiences that allow them to prepare and characterize a variety of nanostructured systems using in-house state-of-the-art instrumentation. This hands-on laboratory component enhances the attractiveness of students to both employers and graduate schools.

Nanoscience and Nanotechnology Minor

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The minor in nanoscience and nanotechnology requires a total of 15 credit hours, distributed as follows:

1. Nano Core (9 hours). NANO 3000, PHYS 2660, and either CHEM 2610 or CHBE 4840.
2. Elective courses. 6 hours selected from the following list of approved subjects.

BME 4200	Principles and Applications of BioMicro ElectroMechanical Systems (BioMEMS)
BME 4500	Nanobiotechnology
CHBE 4830	Molecular Simulation
CHBE 4840	Applications of Nanostructures
CHBE 4850	Semiconductor Materials Processing
CHBE 4860	Molecular Aspects of Chemical Engineering
CHBE 4870	Polymer Science and Engineering
CHBE 4880	Corrosion Science and Engineering
CHEM 2610	Introduction to Nanochemistry
CHEM 3300	Physical Chemistry: Quantum Mechanics, Spectroscopy, and Kinetics
CHEM 3630	Macromolecular Chemistry: Polymers, Dendrimers, and Surface Modification
CHEM 5610	Chemistry of Inorganic Materials
EECE 4283	Principles and Models of Semiconductor Devices
EECE 4284	Integrated Circuit Technology and Fabrication
EECE 4288	Optoelectronics
EECE 4385	VLSI Design
EECE 6306	Solid-State Effects and Devices I
IMS 5320	Nanoscale Science and Engineering
ME 8320	Statistical Thermodynamics
ME 8323	Micro/Nanoelectromechanical Systems
ME 8365	Micro/Nanoscale Energy Transport
MSE 6310	Atomic Arrangements in Solids
PHYS 2255	Modern Physics and the Quantum World
PHYS 3640	Physics of Condensed Matter

Courses taken to satisfy relevant degree requirements for majors in the College of Arts and Science and the School of Engineering may also be counted toward fulfilling the minor.

Scientific Computing

DIRECTORS Robert E. Bodenheimer, Thomas J. Palmeri, David A. Weintraub

Affiliated Faculty

PROFESSORS Ralf Bennartz (Earth and Environmental Sciences), Gautam Biswas (Electrical Engineering and Computer Science), Mario Crucini (Economics), Peter T. Cummings (Chemical and Biomolecular Engineering), Mark N. Ellingham (Mathematics), David Furbish (Earth and Environmental Sciences), Guilherme Gualda (Earth and Environmental Sciences), Gordon D. Logan (Psychology), Terry P. Lybrand (Chemistry and Pharmacology), Charles F. Maguire (Physics), Clare M. McCabe (Chemical and Biomolecular Engineering), Jens Meiler (Chemistry), Michael I. Miga (Biomedical Engineering), Mark Neamtu (Mathematics), Thomas J. Palmeri (Psychology and Neuroscience), Antonis Rokas (Biological Sciences), Jeffrey D. Schall (Psychology and Neuroscience), Larry Schumaker (Mathematics), Paul Sheldon (Physics), Kalman Varga (Physics), David A. Weintraub (Astronomy), Robert Weller (Electrical Engineering)

ASSOCIATE PROFESSORS Andreas A. Berlind (Astronomy), Robert E. Bodenheimer (Computer Science), Kelly Holley-Bockelmann (Astronomy), Shane Hutson (Physics), Bennett Landman (Electrical Engineering), Haoxiang Luo (Mechanical Engineering), Greg Walker (Mechanical Engineering), Steve Wernke (Anthropology)

ASSOCIATE PROFESSOR OF THE PRACTICE Gerald H. Roth (Computer Science)

ASSISTANT PROFESSORS Tony Capra (Biological Sciences and Biomedical Informatics), William Holmes (Physics and Astronomy), Carlos Lopez (Cancer Biology), Sean Polyn (Psychology and Neuroscience), Jennifer Trueblood (Psychology)

ADJUNCT ASSISTANT PROFESSORS William R. French (Chemical and Biomolecular Engineering), Davide Vanzo (Chemistry)

FACULTY in the School of Engineering and the College of Arts and Science offer an interdisciplinary minor in scientific computing to help natural and social scientists and engineers acquire the ever-increasing computational skills that such careers demand. The minor is administered by the School of Engineering. Students who complete this minor will have a toolkit that includes programming skills useful for simulating physical, biological, and social dynamics, as well as an understanding of how to take advantage of modern software tools to extract meaningful information from small and large datasets.

Computation is now an integral part of modern science and engineering. In science, computer simulation allows the study of natural phenomena impossible or intractable through experimental means. In engineering, computer simulation allows the analysis and synthesis of systems too expensive, dangerous, or complex to model and build directly. Astronomers studying the formation of massive black holes, neuroscientists studying neural networks for human memory, mechanical engineers studying the designs of turbines and compressors, and electrical engineers studying the reliability of electronics aboard spacecraft are united both in the computational challenges they face and the tools and techniques they use to solve these challenges.

Students in the program in scientific computing are taught techniques for understanding such complex physical, biological, and also social systems. Students are introduced to computational methods for simulating and analyzing models of complex systems, to scientific visualization and data mining techniques needed to detect structure in massively large multidimensional data sets, to high performance computing techniques for simulating models on computing clusters with hundreds or thousands of parallel, independent processors and

for analyzing terabytes or more of data that may be distributed across a massive cloud or grid storage environment.

Scientific computing at Vanderbilt is supported by faculty and includes students from a wide range of scientific and engineering disciplines. While the content domain varies, these disciplines often require similar computational approaches, high-performance computing resources, and skills to simulate interactions, model real-life systems, and test competing hypotheses. Scientific computing embodies the computational tools and techniques for solving many of the grand challenges facing science and engineering today.

The minor in scientific computing prepares students for advanced coursework that combines computational approaches with a substantive area of science or engineering. It prepares students for independent study with a faculty member on a research project. It prepares students for advanced study in graduate school. It provides skills that will be attractive to many employers after graduation.

The minor in scientific computing is distinct from the minor in computer science. Scientific computing uses computation as a tool to solve scientific and engineering problems in research and application. It is more focused on simulation, numerical techniques, high performance computing, and higher-level methods than the minor in computer science, which is focused on the algorithms, systems, and technologies that enable such methods to be developed and employed.

Scientific Computing Minor

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

The minor in scientific computing requires 15 credit hours, distributed as follows:

1. CS 1101 or 1103 or 1104. (3 hours)
2. CS 2204 (CS 2201 may be substituted for 2204 with the approval of a program director). (3 hours)
3. Scientific Computing 3250. (3 hours)
4. 6 hours of electives. Electives include courses in Scientific Computing (SC), courses approved for SC credit that are in another subject area, courses that meet the approval of a director of the SC minor, and independent study with a faculty member affiliated with the SC minor.

SC 3260	High Performance Computing
SC 3850	Independent Study
SC 3851	Independent Study
SC 3890	Special Topics

Approved elective courses by subject are listed below. These electives provide a detailed treatment of core scientific computing tools and techniques or combine scientific computing tools and techniques with a substantive area of science or engineering. Electives require a significant amount of course work that involves coding solutions to scientific or engineering problems as opposed to running programs someone else wrote, downloaded, or purchased.

ANTH 3261	Introduction to Geographic Information Systems and Remote Sensing
ASTR 3600	Stellar Astrophysics
ASTR 3700	Galactic Astrophysics
ASTR 3800	Structure Formation in the Universe
BMIF 6310	Foundations Of Bioinformatics.
BMIF 7380	Data Privacy in Biomedicine.
BME 3200	Analysis of Biomedical Data
BME 4310	Modeling Living Systems for Therapeutic Bioengineering
BME 7310	Advanced Computational Modeling and Analysis in Biomedical Engineering
BME 7410	Quantitative Methods in Biomedical Engineering
CHBE 4830	Molecular Simulation
CHEM 5410	Molecular Modeling Methods
CHEM 5420	Computational Structure and Chemical Biology
CE 4320	Data Analytics for Engineers
CS 3274	Modeling and Simulation
EES 4760	Agent- and Individual-Based Computational Modeling
EECE 6358	Quantitative Medical Image Analysis
ECON 3035	Econometric Methods
ECON 3750	Econometrics for Big Data
MATH 3620	Introduction to Numerical Mathematics
MATH 3630	Mathematical Modeling in Biology and Medicine
MATH 3660	Mathematical Modeling in Economics
MATH 3670	Mathematical Data Science
MATH 4600	Numerical Analysis
MATH 4620	Linear Optimization
MATH 4630	Nonlinear Optimization
ME 4263	Computational Fluid Dynamics and Multiphysics Modeling
ME 4275	Finite Element Analysis
NSC 3270	Computational Neuroscience
PHYS 3200	Statistical Physics
PHYS 3790	Computational Physics
PSY 8218	Computational Modeling
PSY 8219	Scientific Computing for Psychological and Brain Sciences
PSY 8503	Models of Human Memory

Engineering Courses

Biomedical Engineering

BME 1015. Innovations in Biomedical Engineering. Review of areas within the field of BME. Topics include current research and industry trends in imaging, regenerative medicine, biophotonics, medical devices, technology and entrepreneurship, and low resource engineering. Open only to first-year and transfer students. Students in the School of Engineering receive open elective credit for BME 1015. SPRING. [1]

BME 2001. Systems Physiology I. [Formerly BME 3100] Quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (nervous, musculoskeletal, cardiovascular, blood). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. No credit for students who have earned credit for BME 3100. Prerequisite: CS 1101 or 1103 or 1104. Corequisite: BSCI 1510. [3]

BME 2002. Systems Physiology II. [Formerly BME 3101] Quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (immune, endocrine, respiratory, renal, gastrointestinal, reproductive). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. No credit for students who have earned credit for BME 3101. Prerequisite: CS 1101 or 1103 or 1104. Corequisite: BSCI 1510. [3]

BME 2100. Biomechanics. [Formerly BME 101] Structure and mechanics of the musculoskeletal system and the properties and strength of biological materials. Application of Newtonian mechanics, statics, and strength of materials to bone, muscle, tendon, other biological material, and medical devices. Credit offered for only one of BME 2100 or CE 2200. Prerequisite: PHYS 1601, MATH 1301, CS 1101 or 1103 or 1104. [3]

BME 2200. Biomedical Materials: Structure, Property, and Applications. [Formerly BME 103] Structure-property relationships in both natural and synthetic, hard and soft materials. Bio-inspired materials design, the role of self-assembly in achieving highly ordered structures, material design and properties for emerging biomedical applications, factors influencing biocompatibility, performance of biomaterials in both soft and hard tissues, and biological response to implants. Prerequisite: CHEM 1602. SPRING. [3]

BME 2201. Biomedical Engineering Ethics. [Formerly BME 201] Ethical principles in the practice of biomedical engineering: responsibility in professional practice, health care, research and mentoring. Development of skills in perceptiveness, discernment, competency and visualization of alternatives through case studies. Prerequisite: Junior standing. FALL. [3] (Only available for open elective credit for biomedical engineering majors.) (Not currently offered)

BME 2210. Biomaterial Manipulation. [Formerly BME 203] Design and characterization of biomaterials. Assessment of tissue engineering scaffolds and nanoparticles. Manipulation of cell growth and expression. Application of mechanics and materials principles to medical and consumer products. Laboratory exercises in tissue culture, microscopy, mechanical testing, biochemical assays, and computer modeling. Prerequisite: BME 2100, BSCI 1510/1510L. Corequisite: BME 2200. SPRING. [3]

BME 2400. Quantitative Methods I: Statistical Analysis. Application of modern computing methods to the parametric and nonparametric statistical analysis of biomedical data. Probability, sampling, estimation, analysis of variance, single and multivariable regression, and the principles of hypothesis testing, experimental design and clinical trials are emphasized. No credit for students who have earned credit for BME 3200. Prerequisite: MATH 2300. Corequisite: CS 1101 or 1103 or 1104. [3]

BME 2860. Introduction to Undergraduate Research. Introduction to research, either experimental or theoretical in nature or a combination of both, under the supervision of a biomedical engineering faculty member or another faculty member approved by the course director. Students in the School of Engineering may only receive open elective credit for BME 2860. Prerequisite: Consent of course director (see BME undergraduate website for registration details). FALL, SPRING. [1-3]

BME 2900W. Biomedical Engineering Lab I. Introductory laboratory with guided reports. Experiment topics may cover systems physiology, biomechanics, and biomaterials. Emphasis on methods, instrumentation, and equipment used in biomedical engineering. One three-hour laboratory per week. No credit for students who have earned credit for BME 4900W. Prerequisite: CS 1101 or 1103 or 1104. Corequisite: BME 2100. [1]

BME 3000. Physiological Transport Phenomena. Mechanics of fluids, heat transfer, and mass transfer in living systems. Basic theories of transport phenomena, applications to mammalian and cellular physiology and the design of medical devices. Prerequisite: BME 2100; MATH 2400 or 2420. [3]

BME 3100. Systems Physiology. [Formerly BME 251] Quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (nervous, musculoskeletal, cardiovascular, blood). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. Prerequisite: CS 1101 or 1103 or 1104. Corequisite: BSCI 1510. FALL. [3]

BME 3101. Systems Physiology. [Formerly BME 252] Quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (immune, endocrine, respiratory, renal, gastrointestinal, reproductive). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. Prerequisite: CS 1101 or 1103 or 1104. Corequisite: BSCI 1510. SPRING. [3]

BME 3110. Neuromuscular Mechanics and Physiology. [Formerly BME 253] Quantitative characterization of the physiological and mechanical properties of the neuromuscular system. Quantitative models of system components. Applications to fatigue, aging and development, injury and repair, and congenital and acquired diseases. Prerequisite: BME 2100, BME 3100. SPRING. [3]

BME 3200. Analysis of Biomedical Data. [Formerly BME 260] Application of modern computing methods to the statistical analysis of biomedical data. Sampling, estimation, analysis of variance, and the principles of experimental design and clinical trials are emphasized. Prerequisite: Math 2300. SPRING. [3]

BME 3300. Biomedical Instrumentation. [Formerly BME 271] Methods to determine physiological functions and variables from the point of view of optimization in the time and frequency domain and the relation to physiological variability. Laboratory exercises stress instrumentation usage and data analysis. Three lectures and one laboratory. Prerequisite: EECE 2213 and 2213L. FALL, SPRING. [4]

BME 3301. Biomedical Instrumentation I. Electronic circuits for measuring and processing physiological signals, analog front-end design, analog-to-digital conversion and digital signal processing. Physics and applications of clinically relevant biosensors. Laboratory exercises focus on construction, verification, and validation of biomedical instruments. Three lectures and one three-hour laboratory. No credit for students who have earned credit for BME 3300. Prerequisite: EECE 2112. [4] (Not offered until 2020-2021)

BME 3302. Biomedical Instrumentation II. Systems-level approach to the design of devices that monitor clinically-relevant physiological functions and variables, driven by the needs of specific pathophysiological conditions. Laboratory exercises stress instrumentation design and integration of multiple modalities into an instrumentation platform.

Three lectures and one three-hour laboratory. No credit for students who have earned credit for BME 3300. Prerequisite: BME 3301. [4] (Not offered until 2020-2021)

BME 3400. Quantitative Methods II: Signals and Numerical Analysis. Quantitative analysis and computational methods for biomedical engineering applications. Signal and image processing, numerical analysis, and linear and nonlinear models. No credit for students who have earned credit for BME 3300. Prerequisite: CS 1101 or 1103 or 1104; MATH 2400. [3] (Not offered until 2020-21)

BME 3500. Biomedical Materials: Structure-Property Relationships and Applications. [Formerly BME 2200] Structure-property relationships in both natural and synthetic, hard and soft materials. Bio-inspired materials design, the role of self-assembly in achieving highly ordered structures, material design and properties for emerging biomedical applications, factors influencing biocompatibility, performance of biomaterials in both soft and hard tissues, and biological response to implants. No credit for students who have earned credit for BME 2200. Prerequisite: CHEM 1602, BME 2100. [3]

BME 3600. Signal Measurement and Analysis. [Formerly BME 263] Discrete time analysis of signals with deterministic and random properties and the effect of linear systems on these properties. Brief review of relevant topics in probability and statistics and introduction to random processes. Discrete Fourier transforms, harmonic and correlation analysis, and signal modeling. Implementation of these techniques on a computer is required. Corequisite: BME 3200 or MATH 2810. SPRING. [3]

BME 3830. Biomedical Engineering Service Learning and Leadership. [Formerly BME 249] Identification of local and global human needs, methods of need quantification, implementation of engineering solutions, sustainability, preparation of grant proposals, leadership principles. Independent service project required. Prerequisite: Junior standing. FALL. [3]

BME 3860. Undergraduate Research. Independent research, either experimental or theoretical in nature or a combination of both, under the supervision of a biomedical engineering faculty member or another faculty member approved by the course director. The class meets one hour per week to discuss research design, responsible conduct of research, laboratory documentation, literature review, and scientific writing. Prerequisite: Junior standing, consent of course director (see BME undergraduate website for registration details). [2-3; maximum of 6 hours total for all semesters of BME 3860 and 3861]

BME 3861. Undergraduate Research. [Formerly BME 240B] A continuation of the research in 3860 or research in a different area of biomedical engineering. Prerequisite: Consent of course director. [1-3 each semester; maximum of 6 hours total for all semesters of BME 3860 and 3861.]

BME 3890. Special Topics. [Formerly BME 290A] [3]

BME 3891. Special Topics. [Formerly BME 290B] [3]

BME 3892. Special Topics. [Formerly BME 290C] [3]

BME 3893. Special Topics. [Formerly BME 290D] [3]

BME 3900W. Biomedical Engineering Lab II. Intermediate laboratory with oral and written reports. Experiment topics may include thermodynamics, biological transport, signal analysis, biological control, and biological imaging. Emphasis on data analysis and communication. One three-hour laboratory per week. No credit for students who have earned credit for BME 4900W. Prerequisite: BME 2900W. Corequisite: BME 2001, 2002. [1] (Not offered until 2020-2021)

BME 4000. Bioelectricity. [Formerly BME 256] Cellular basis of the electrical activity of nerve and muscle cells; action potential propagation; voltage- and ligand-gated ion channels; space, voltage, and patch clamp; and electrical, optical, and magnetic measurements of bioelectric activity in cells, isolated tissues, intact animals, and humans. Prerequisite: Math 2400 or 2420, BSCI 1510. FALL. [3]

BME 4100. Lasers in Surgery and Medicine. [Formerly BME 285] Fundamentals of lasers, light-tissue interaction, problem-based design

of optical instrumentation. Applications in laser surgery, disease detection, and surgical guidance. Includes hands-on experiences. Prerequisite: PHYS 1602. FALL. [3]

BME 4100L. Biomedical Optics Laboratory. [Formerly BME 285L] Practical experience in basics of operating lasers, using optics, fiber optics and interferometry. Computer-aided design of optical systems and computer simulations of light tissue interaction. Application of optical concepts to biomedical problems. Prerequisite: Senior standing. Corequisite: BME 4100. FALL. [1]

BME 4200. Principles and Applications of BioMicroElectroMechanical Systems (BioMEMS). [Formerly BME 274] The principles, design, fabrication and application of micro- and nano-devices to instrument and control biological molecules, living cells, and small organisms, with a strong emphasis on development of microfabricated systems and micro- and nano-biosensors. Students will lead discussions from the research literature. FALL. [3]

BME 4200L. BioMicroElectroMechanical Systems Laboratory. [Formerly BME 274L] Design, fabrication, and testing of BioMEMS devices for applications in the life sciences. Practical experience in photolithography, replica molding to fabricate microfluidic devices, and multilayer devices to assemble microfluidic devices with active valves. Corequisite: BME 4200. FALL. [1]

BME 4300. Therapeutic Bioengineering. [Formerly BME 275] Explores the engineering aspects of treating disease or disorders. Surgical mechanics, diffusion therapies including chemical and energy diffusion, image-guided therapies, and the role of discovery and design in the development of medical treatments. Prerequisite: EECE 2213, BME 3000. Corequisite: BME 2100, BME 3300. SPRING. [3]

BME 4310. Modeling Living Systems for Therapeutic Bioengineering. [Formerly BME 279] Computer modeling and simulation in therapeutic bioengineering processes. Building computer models and using modern modeling software tools. Numerical techniques to solve differential equations, and origin of mathematical models for biotransport, biomechanics, tumor/virus growth dynamics, and model-based medical imaging techniques. Prerequisite: MATH 2400 or 2420; CS 1101 or 1103 or 1104; BME 2100. SPRING [3]

BME 4400. Foundations of Medical Imaging. [Formerly BME 258] Physics and engineering of image formation by different modalities used for medical applications. Concepts common to different imaging modalities and limits of physical phenomena. Mathematical concepts of image formation and analysis; techniques for recording images using ionizing radiation (including CT), ultrasound, magnetic resonance, and nuclear (including SPECT and PET). Methods of evaluating image quality. Prerequisite: PHYS 1602, MATH 2400. SPRING. [3]

BME 4410. Biological Basis of Imaging. [Formerly BME 276] Physical and chemical relationships between biological characteristics of tissue and image contrast in major medical imaging modalities. Imaging modalities include x-ray, MRI, PET, and ultrasound. Applications include neurological disorders, neurological function, cardiac function and disease, cancer, and musculoskeletal physiology. Prerequisite: PHYS 1602, MATH 2400. SPRING. [3]

BME 4420. Quantitative and Functional Imaging. [Formerly BME 277] Quantitative analysis of non-invasive imaging techniques to assess the structure and function of tissues in the body. Applications of computed tomography, positron emission tomography, ultrasound, and magnetic resonance imaging to tissue characterization. Measurement of lesion volume, cardiac output, organ perfusion, brain function, and receptor density. Prerequisite: CS 1101 or 1103 or 1104; PHYS 1602; MATH 2400. FALL [3]

BME 4500. Nanobiotechnology. [Formerly BME 281] Synthesis and characterization of nanostructured materials for use in living systems. Clinical applications of nanoscale biosensors. Methods for single molecule detection in biological specimens. Quantitative structure/function assessment of nanostructures in living systems. Prerequisite: BSCI 1510; BME 3000 or CHBE 3300 or ME 3224. SPRING. [3]

BME 4500L. Nanobiotechnology Laboratory. [Formerly BME 281L] Laboratory experiments in the characterization of nanomaterial interactions with living systems. Biological surface functionalization of inorganic nanoparticles. Measurement of cultured mammalian cell response to nanostructures. Quantitative structure/function assessment of nanostructures in living systems. Corequisite: BME 4500. SPRING. [1]

BME 4600. Tissue Engineering. [Formerly BME 280] Basic principles, methods, and current topics in tissue engineering. Integration of biology, materials science, and biomechanics in the design and fabrication of engineered tissues. Biomaterials for scaffolding, stem cell applications, bioreactor design, and practical methods for testing. Case studies and guest lectures from experts in the field. Prerequisite: BSCI 1510, CHEM 1602. FALL. [3]

BME 4900W. Biomedical Engineering Laboratory. [Formerly BME 255W] Laboratory experiments in biomechanics, thermodynamics, biological transport, signal analysis, biological control, and biological imaging. Emphasis is on current methods, instrumentation, and equipment used in biomedical engineering; on oral presentation of results; and on the writing of comprehensive reports. No credit for BME 4900W and BME 2900W, 3900W, or 4901W. One lecture and one three-hour laboratory per week. Prerequisite: BME 3100. Corequisite: BME 3000. [3]

BME 4901W. Biomedical Engineering Lab III. Advanced laboratory with comprehensive written reports. Students design experiments building on laboratory exercises conducted in BME 2900W and 3900W. Emphasis on experimental design, use of controls, and interpretation of data. One three-hour laboratory per week. No credit for students who have earned credit for BME 4900W. Prerequisite: BME 2400, 3900W. [1] (Not offered until 2021/2022.)

BME 4950. Design of Biomedical Engineering Devices and Systems I. [Formerly BME 272] Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. Corequisite: BME 3300. Prerequisite: BME 3100. [2]

BME 4951. Design of Biomedical Engineering Devices and Systems II. [Formerly BME 273] Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. Prerequisite: BME 4950. [3]

BME 4959. Senior Engineering Design Seminar. [Formerly BME 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: BME 4950. FALL. [1]

BME 5100. Lasers in Surgery and Medicine. (Also listed as BME 4100) Fundamentals of lasers, light-tissue interaction, problem-based design of optical instrumentation. Applications in laser surgery, disease detection, and surgical guidance. Includes hands-on experiences. No credit for students who have earned credit for 4100. FALL. [3]

BME 5110. Neuromuscular Mechanics and Physiology. (Also listed as BME 3110) Quantitative characterization of the physiological and mechanical properties of the neuromuscular system. Quantitative models of system components. Applications to fatigue, aging and development, injury and repair, and congenital and acquired diseases. No credit for students who have earned credit for 3110. SPRING. [3]

BME 5130. Systems Physiology. (Also listed as BME 3100) Quantitative physiology from the engineering point of view. Descriptive physiology of

several organ systems (nervous, musculoskeletal, cardiovascular, gastrointestinal). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. No credit for students who have earned credit for 3100. FALL. [3]

BME 5131. Systems Physiology. (Also listed as BME 3101) Quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (blood, immune, endocrine, respiratory, renal, reproductive). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. No credit for students who have earned credit for 3101. SPRING. [3]

BME 5200. Principles and Applications of BioMicroElectroMechanical Systems (BioMEMS). (Also listed as BME 4200) The principles, design, fabrication and application of micro- and nano-devices to instrument and control biological molecules, living cells, and small organisms, with a strong emphasis on development of microfabricated systems and micro- and nano-biosensors. Students will lead discussions from the research literature. Graduate students will prepare a research proposal or fabricate a functioning BioMEMS device. No credit for students who have earned credit for 4200. FALL. [3]

BME 5210. Biomaterial Manipulation. (Also listed as BME 2210) Design and characterization of biomaterials. Assessment of tissue engineering scaffolds and nanoparticles. Manipulation of cell growth and expression. Application of mechanics and materials principles to medical and consumer products. Laboratory exercises in tissue culture, microscopy, mechanical testing, biochemical assays, and computer modeling. No credit for students who have earned credit for 3210. Corequisite: BME 2200. SPRING. [3]

BME 5300. Biomedical Instrumentation. (Also listed as BME 3300) Methods to determine physiological functions and variables from the point of view of optimization in the time and frequency domain and the relation to physiological variability. Laboratory exercises stress instrumentation usage and data analysis. Three lectures and one laboratory. No credit for students who have earned credit for 3300. FALL, SPRING. [4]

BME 5400. Foundations of Medical Imaging. (Also listed as BME 4400) Physics and engineering of image formation by different modalities used for medical applications. Concepts common to different imaging modalities and limits of physical phenomena. Mathematical concepts of image formation and analysis; techniques for recording images using ionizing radiation (including CT), ultrasound, magnetic resonance, and nuclear (including SPECT and PET). Methods of evaluating image quality. No credit for students who have earned credit for 4400. SPRING. [3]

BME 5410. Biological Basis of Imaging. (Also listed as BME 4410) Physical and chemical relationships between biological characteristics of tissue and image contrast in major medical imaging modalities. Imaging modalities include x-ray, MRI, PET, and ultrasound. Applications include neurological disorders, neurological function, cardiac function and disease, cancer, and musculoskeletal physiology. No credit for students who have earned credit for 4410. SPRING. [3]

BME 5500. Nanobiotechnology. (Also listed as BME 4500) Synthesis and characterization of nanostructured materials for use in living systems. Clinical applications of nanoscale biosensors. Methods for single molecule detection in biological specimens. Quantitative structure/function assessment of nanostructures in living systems. No credit for students who have earned credit for 4500. SPRING. [3]

BME 5600. Signal Measurement and Analysis. (Also listed as BME 3600) Discrete time analysis of signals with deterministic and random properties and the effect of linear systems on these properties. Brief review of relevant topics in probability and statistics and introduction to random processes. Discrete Fourier transforms, harmonic and correlation analysis, and signal modeling. Implementation of these techniques on a computer is required. No credit for students who have earned credit for 3600. SPRING. [3]

BME 5950. Design of Biomedical Engineering Devices and Systems I. (Also listed as BME 4950) Integration of the engineering and life science backgrounds of senior biomedical engineering students through

the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. Corequisite: BME 5300. No credit for students who have earned credit for 4950. [2]

BME 5951. Design of Biomedical Engineering Devices and Systems II. (Also listed as BME 4951) Integration of the engineering and life science backgrounds of senior biomedical engineering students through the presentation of design principles for medical devices and systems. Design principles and case examples for biomedical electronics, mechanical, chemical, and computing systems are presented. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, and through a final written and poster report. No credit for students who have earned credit for 4951. [3]

BME 6110. Research and Professional Development in Biomedical Engineering. [Formerly BME 305] Database search strategies, interpreting engineering and scientific literature, communication skills, engineering design, proposal writing, preparation of engineering publications, technology transfer/intellectual property, engineering laboratory documentation, regulatory oversight, ethics, funding. SPRING. [3].

BME 6301. Engineering in Surgery and Intervention: Provocative Questions. Explores engineering and clinical aspects of treating disease or disorders by clinically-driven provocative questions. Surgical/Interventional mechanics, locoregional therapies such as convection-enhanced delivery, neuromodulation, and ablation. Image-guided therapies, and role of discovery and design in context of treatment. SPRING. [3].

BME 6302. Engineering in Surgery and Intervention: Clinical Interactions. Literature review coupled with clinical immersion experience. Literature review centers on clinical translation of engineering research in surgical/interventional applications. Clinical immersion involves observing surgical/interventional procedures and attending clinical conferences. Prerequisite: Permission of Instructor. FALL. [3].

BME 7110. Laser-Tissue Interaction and Therapeutic Use of Lasers. [Formerly BME 320] Optical and thermal aspects and models of the interaction between laser/light and biological tissue as it is used for therapeutic applications in medicine and biology. Issues and objectives in therapeutic and surgical applications of lasers, overview of state-of-the-art topics and current research. FALL. [3]

BME 7120. Optical Diagnosis: Principles and Applications. [Formerly BME 321] Applications of light and tissue optical properties for the diagnosis of tissue pathology. Basic scientific and engineering principles for developing techniques and devices that use light to probe cells and tissues. Recent applications of different optical diagnostic techniques. SPRING. [3]

BME 7310. Advanced Computational Modeling and Analysis in Biomedical Engineering. [Formerly BME 329] Survey of current topics within biomedical modeling: biotransport, biomechanics, tumor and virus growth dynamics, model-based medical imaging techniques, etc. Mathematical development and analysis of biomedical simulations using advanced numerical techniques for the solution of ordinary and partial differential equations. Emphasis will be on graduate research related topics. SPRING. [3]

BME 7410. Quantitative Methods in Biomedical Engineering. [Formerly BME 300] Mathematics, quantitative analysis, and computational methods for biomedical engineering applications. Topics include applied probability and statistics, signal analysis and experiment design, linear systems, Fourier transforms, and numerical modeling and analysis. FALL. [3]

BME 7413. Advanced Biomechanics. [Formerly BME 313] Application of advanced concepts in statics, dynamics, continuum mechanics, and strength of materials to biological systems. Topics include measurement of mechanical properties of biological materials; rheological properties of blood; mechanics of cells, bone, skeletal muscle,

and soft tissue; normal and abnormal dynamics of human movement; mechanics of articular joint movement; pulmonary mechanics; cardiac mechanics; arterial mechanics; mechanics of veins and collapsible vessels; and mechanics of flow in the microcirculation. Prerequisite: BME 2100, BME 3000 or equivalent. [3]

BME 7419. Engineering Models of Cellular Phenomena. [Formerly BME 319] Application of engineering methods to model and quantify aspects of cell physiology. Topics include receptor mediated cell processes, cell-cell signaling, cooperative barrier behavior, cell structural components, and cell motility. SPRING. [3] (Offered alternate years)

BME 7420. Magnetic Resonance Imaging Methods. [Formerly BME 378] MR techniques to image tissue for clinical evaluation and research. RF pulses, k-space trajectories, chemical shift, motion, flow, and relaxation. Derivation of signal equations for pulse sequence design and analysis. Course includes hands-on experimental studies. SPRING. [3]

BME 7425. Physical Measurements on Biological Systems. [Formerly BME 325] A survey of the state-of-the-art in quantitative physical measurement techniques applied to cellular or molecular physiology. Topics include the basis for generation, measurement, and control of the transmembrane potential; electrochemical instrumentation; optical spectroscopy and imaging; x-ray diffraction for determination of macromolecular structure; magnetic resonance spectroscopy and imaging. Prerequisite: PHYS 2250. SPRING. [3]

BME 7430. Cancer Imaging. [Formerly BME 330] Applications of noninvasive, in vivo imaging (i.e., MRI, optical, CT, SPECT, PET, and ultrasound) to cancer biology. Emphasis on assessing the response of tumors to treatment using emerging and quantitative imaging techniques. Prerequisite: BME 4400 or PHYS 2805. SPRING. (Offered alternate years) [3]

BME 7440. Neuroimaging. [Formerly BME 331] Applications of noninvasive imaging techniques including MRI, fMRI, optical, EEG, and PET to the study of neural systems. Emphasis on the human brain, with a focus on current scientific literature. Prerequisite: BME 4400 or PHYS 2805. FALL. (Offered alternate years) [3]

BME 7450. Advanced Quantitative and Functional Imaging. Analysis of non-invasive imaging techniques to assess the structure and function of tissues in the body. Applications of computed tomography, positron emission tomography, ultrasound, and magnetic resonance imaging to tissue characterization, including measurement of tissue volume, microstructure, organ perfusion, blood flow, brain function, and receptor density. Prerequisite: working knowledge of MATLAB. FALL. [3]

BME 7473. Design of Medical Products, Processes, and Services. [Formerly BME 373] Medical design projects involving teams of graduate level engineering and management students. Projects are solicited from industry or universities and are undertaken from the initial phase of a design request to the end product, prototype, plan, or feasibility analysis. Prerequisite: BME 4950 or equivalent. SPRING. [3]

BME 7500. Independent Study in Biomedical Engineering. [Formerly BME 390] Study of advanced biomedical engineering topics not regularly offered in the curriculum. Consent of instructor is required. FALL, SPRING. [3]

BME 7899. Master of Engineering Project. [Formerly BME 389]

BME 7999. Master's Thesis Research. [Formerly BME 369]

BME 8900. Special Topics. [Formerly BME 395A] [1-3]

BME 8901. Special Topics. [Formerly BME 395B] [1-3]

BME 8902. Special Topics. [Formerly BME 395C] [1-3]

BME 8903. Special Topics. [Formerly BME 395D] [1-3]

BME 8991. Biomedical Research Seminar. [Formerly BME 391] [1]

BME 8992. Biomedical Research Seminar. [Formerly BME 392] [1]

BME 8993. Biomedical Research Seminar. [Formerly BME 393] [1]

BME 8994. Biomedical Research Seminar. [Formerly BME 394] [1]

BME 8999. Non-Candidate Research. [Formerly BME 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

BME 9999. Ph.D. Dissertation Research. [Formerly BME 399] [0-12]

Chemical and Biomolecular Engineering

CHBE 2100. Chemical Process Principles. [Formerly CHBE 161] A foundation for advanced work in chemical engineering. Process problems of a chemical and physico-chemical nature. Emphasis on stoichiometry, material balances, and energy balances required for design computation. Prerequisite: CHEM 1602, MATH 1301. FALL. [3]

CHBE 2150. Molecular and Cell Biology for Engineers. [Formerly CHBE 220] Basic molecular and cellular biology principles and concepts. Application of engineering principles to further the understanding of biological systems. Protein structure and function, transcription, translation, post-translational processing, cellular organization, molecular transport and trafficking, and cellular models. Students who have earned credit for BSCI 1510 may not take CHBE 2150. Prerequisite: CHEM 1602. FALL. [3]

CHBE 2200. Chemical Engineering Thermodynamics. [Formerly CHBE 162] Application of the laws of thermodynamics to chemical engineering systems. Entropy balances and analysis of thermodynamic cycles. Methods of estimating thermodynamic properties of pure fluids and mixtures, including equations of state, to provide background for chemical process design and simulation. Prerequisite: MATH 2300. SPRING. [3]

CHBE 2250. Modeling and Simulation in Chemical Engineering. [Formerly CHBE 180] Development of chemical engineering process models and their numerical solutions. The models include solution of linear and non-linear equations, eigenvalue problems, differentiation, and integration, ordinary differential equations, linear and nonlinear regression. Chemical process simulation using commercial simulators is introduced. Prerequisite: CHBE 2100. Corequisite: CHBE 2200; MATH 2420; CS 1101 or 1103 or 1104. SPRING. [3]

CHBE 2900W. Technical Communications for Chemical Engineers. Preparation for academic and professional communication tasks. Principles of effective communication, information design, and audience awareness. Development of written reports, oral presentations, posters, visuals, emails, letters, and memos for communicating technical details. Corequisite: CHBE 2200. SPRING [1]

CHBE 3200. Phase Equilibria and Stage-Based Separations. [Formerly CHBE 223] Thermodynamic principles and calculations of mixture phase equilibrium. Development of correlations to design chemical separation processes. Applications to separation processes involving gases, liquids, and solids such as distillation, adsorption, and extraction. Simulation of separation processes. Prerequisite: CHBE 2100, CHBE 2200, and either CHBE 2250 or BME 2100. FALL. [3]

CHBE 3250. Chemical Reaction Engineering. [Formerly CHBE 225] Thermodynamic basis of chemical equilibrium. Analysis of chemical kinetic data and application to the design of chemical reactors. Batch, semibatch, and flow reactors are considered in both steady-state and transient operation. Brief treatments of catalysis and physical and chemical adsorption. Prerequisite: CHEM 2211 or 2221; CHBE 3200. SPRING. [3]

CHBE 3300. Fluid Mechanics and Heat Transfer. [Formerly CHBE 230] Principles of momentum and energy transport and their application to the analysis and design of chemical and biological engineering systems. Prerequisite: MATH 2420. FALL. [3]

CHBE 3350. Mass Transfer and Rate-Based Separations. [Formerly CHBE 231] Principles of mass transfer and their application to the analysis of chemical and biological engineering systems. Design of rate-based separation operations. Prerequisite: CHBE 3300. SPRING. [3]

CHBE 3600. Chemical Process Control. [Formerly CHBE 242] Design of control systems for chemical processes. Principles of process

dynamics and control of single and multivariable systems. Frequency and stability analyses and their effect on controller design. Prerequisite: CHBE 2250, MATH 2420. FALL. [3]

CHBE 3860. Undergraduate Research. [Formerly CHBE 246] Opportunities for individual students to do research under the guidance of a faculty member. Requires faculty sponsorship of the project. [1-3 each semester]

CHBE 3861. Undergraduate Research. [Formerly CHBE 247] Opportunities for individual students to do research under the guidance of a faculty member. Requires faculty sponsorship of the project. [1-3 each semester]

CHBE 3890. Special Topics. [Formerly CHBE 290] [Variable credit: 0-3 each semester]

CHBE 3900W. Chemical Engineering Laboratory I. [Formerly CHBE 228W] Laboratory experiments in momentum, energy and mass transport, focusing on chemical engineering fundamentals, instrumentation, and unit operations. Statistical treatment of data, error analysis, and experimental design. Written reports, oral presentations, and laboratory safety are emphasized. One 5-hour laboratory per week. Prerequisite: CHBE 2100, CHBE 2200, CHBE 2900W, CHBE 3300, and either CHBE 2250 or BME 2100. Corequisite: CHBE 3350. SPRING. [3]

CHBE 4500. Bioprocess Engineering. [Formerly CHBE 283] Application of cellular and molecular biology to process engineering to describe the manufacture of products derived from cell cultures. Design and scale-up of bioreactors and separation equipment. Metabolic and protein engineering utilizing genetically engineered organisms. Prerequisite: BSCI 1510 or CHBE 2150; CHBE 3250, CHBE 3300. [3]

CHBE 4800. The Molecular and Cellular Mechanome. Applications of molecular and cellular biophysics and mechanics over various lengths, energy and timescales to describe biological phenomena through an 'omics' systems level perspective to molecular motors, cell machinery, mechanotransduction, cell migration, cell division, and nonequilibrium receptor ligand interactions. Physical and engineering based descriptions of molecular and cellular machinery incorporating biophysics and statistical and continuum mechanics perspectives. Modern and historical results, instrumentation, and measurement techniques. Prerequisite: Junior standing. FALL. [3]

CHBE 4805. Biomolecular Engineering and Design. Approaches for interrogating and controlling biological function on a molecular and cellular level. Applications to biotechnology fields such as diagnostics, therapeutics, and regenerative medicine. Focus areas include concepts of molecular recognition, extracellular and intracellular signal transduction, protein engineering, genome engineering, cellular engineering, and tissue engineering. Prerequisite: CHBE 2150 or BSCI 1510. [3]

CHBE 4810. Metabolic Engineering. [Formerly CHBE 282] Analysis and synthesis of metabolic networks using principles of thermodynamics, kinetics, and transport phenomena. Computational approaches for predicting metabolic phenotypes. Experimental techniques to measure and manipulate key metabolic variables including pathway fluxes, protein/gene expression, enzyme regulation, and intracellular metabolite concentrations. Prerequisite: BSCI 1510 or CHBE 2150; junior standing. [3]

CHBE 4820. Immunoengineering. Approaches and technologies for manipulating and studying the immune system. Topics include fundamentals of immunology, immunology tools and methods, vaccines and immunotherapies, drug delivery principles, and materials engineering for immunomodulation. Prerequisite: CHBE 2150 or BSCI 1510. [3]

CHBE 4830. Molecular Simulation. [Formerly CHBE 285] Modern tools of statistical mechanics, such as Monte Carlo and molecular dynamics simulation, and variations. Methods, capabilities, and limitations of molecular simulation and applications to simple and complex fluids relevant to the chemical and related processing industries. Prerequisite: CHBE 3200, CHEM 3300. [3]

CHBE 4840. Applications of Nanostructures. An engineering and materials science perspective on the physical and chemical properties of organic and inorganic nanostructures. Applications in nanomedicine

for imaging and therapy, and in power systems for solar energy conversion and energy storage. SPRING. [3]

CHBE 4850. Semiconductor Materials Processing. [Formerly CHBE 284] Materials processing unit operations of silicon device manufacturing. Basic semiconductor physics and device theory, production of substrates, dopant diffusion, ion implantation, thermal oxidation and deposition processes, plasma deposition processes, photolithography, wet chemical and plasma etching, and analytical techniques. Lectures alternate with one two-hour laboratory on a weekly basis. FALL. [3]

CHBE 4860. Molecular Aspects of Chemical Engineering. [Formerly CHBE 286] Integration of molecular chemistry, property-based thermodynamic descriptions, and a focus on intermolecular energetics for process analysis and product design. Case studies involve molecular, macromolecular, supramolecular, and biomolecular systems. Prerequisite: CHEM 2211 or 2221; CHBE 2200. [3]

CHBE 4870. Polymer Science and Engineering. [Formerly CHBE 287] Macromolecular systems with emphasis on the interrelationship of chemical, physical, and engineering properties. Further relation of these properties to synthesis. Physicochemical and biological applications. Prerequisite: CHBE 2200, a basic understanding of organic and physical chemistry. [3]

CHBE 4880. Corrosion Science and Engineering. [Formerly CHBE 288] Aqueous-phase metal and alloy corrosion phenomena. Fundamental chemistry and electrochemistry theories, as applied to corroding systems. Specific forms of corrosion including pitting, crevice corrosion, and galvanic corrosion. Methods for corrosion control based on electrochemical fundamentals. Prerequisite: CHBE 3300. SPRING. [3]

CHBE 4900W. Chemical Engineering Laboratory II. [Formerly CHBE 229W] Laboratory experiments in unit operations covering reactions and separations. Interpretation of data for equipment and process design. Methods of hazard analysis, their application to lab-scale unit operations, and the scale-up of chemical processes from laboratory data. Written reports and oral presentations are emphasized. One 5-hour laboratory per week. Prerequisite: CHBE 3900W or BME 3300 or CHEM 3315. Corequisite: ChBE 4950W. FALL. [3]

CHBE 4950W. Chemical Engineering Process and Product Design. [Formerly CHBE 233W] A systematic approach to design and safety practices for chemical process operations leading to the identification of a team-based capstone design project. Design, economic evaluation of alternatives, ethics, and cost and safety analysis of chemical, biological, and petroleum process and products. Systems-based process integration design methodologies. Steady-state simulation using chemical engineering design software. Three lecture hours and one two-hour laboratory each week. Prerequisite: CHBE 3200, CHBE 3250, CHBE 3350. Corequisite: ChBE 4900W, ChBE 4959. FALL. [4]

CHBE 4951W. Chemical Engineering Design Projects. [Formerly CHBE 234W] Continuation of a team-based design project from ChBE 4950W. Evaluations through periodic oral and written presentations, a final written report, and a poster report. Emphasis on design tools and methodologies, economic assessment, and hazard analysis leading to a recommended chemical product or process design that meets key safety and economic criteria. Prerequisite: CHBE 4950W. SPRING. [3]

CHBE 4959. Professional Practice of Safety in Chemical Engineering Design. [Formerly CHBE 297] Elements of professional engineering practice. Hazard analysis methodologies applied to chemical products and processes are emphasized and applied to lab-scale unit operations. Professional practice of the design of safe chemical products and processes is examined through case studies. Corequisite: ChBE 4950W. FALL. [1]

CHBE 5200. Phase Equilibria and Stage-Based Separations. (Also listed as CHBE 3200) Thermodynamic principles and calculations of mixture phase equilibrium. Development of correlations to design chemical separation processes. Applications to separation processes involving gases, liquids, and solids such as distillation, adsorption, and extraction. Simulation of separation processes. No credit for students who have earned credit for 3200. FALL. [3]

CHBE 5250. Chemical Reaction Engineering. (Also listed as CHBE 3250) Thermodynamic basis of chemical equilibrium. Analysis of chemical kinetic data and application to the design of chemical reactors. Batch, semibatch, and flow reactors are considered in both steady-state and transient operation. Brief treatments of catalysis and physical and chemical adsorption. No credit for students who have earned credit for 3250. SPRING. [3]

CHBE 5300. Fluid Mechanics and Heat Transfer. (Also listed as CHBE 3300) Principles of momentum and energy transport and their application to the analysis and design of chemical and biological engineering systems. No credit for students who have earned credit for 3300. FALL. [3]

CHBE 5350. Mass Transfer and Rate-Based Separations. (Also listed as CHBE 3350) Principles of mass transfer and their application to the analysis of chemical and biological engineering systems. Design of rate-based separation operations. No credit for students who have earned credit for 3350. SPRING. [3]

CHBE 5500. Bioprocess Engineering. (Also listed as CHBE 4500) Application of cellular and molecular biology to process engineering to describe the manufacture of products derived from cell cultures. Design and scale-up of bioreactors and separation equipment. Metabolic and protein engineering utilizing genetically engineered organisms. No credit for students who have earned credit for 4500. [3]

CHBE 5600. Chemical Process Control. (Also listed as CHBE 3600) Design of control systems for chemical processes. Principles of process dynamics and control of single and multivariable systems. Frequency and stability analyses and their effect on controller design. No credit for students who have earned credit for 3600. [3]

CHBE 5800. The Molecular and Cellular Mechanome. (Also listed as CHBE 4800) Applications of molecular and cellular biophysics and mechanics over various lengths, energy and timescales to describe biological phenomena through an 'omics' systems level perspective to molecular motors, cell machinery, mechanotransduction, cell migration, cell division, and nonequilibrium receptor ligand interactions. Physical and engineering based descriptions of molecular and cellular machinery incorporating biophysics and statistical and continuum mechanics perspectives. Modern and historical results, instrumentation, and measurement techniques. No credit for students who have earned credit for 4800. FALL. [3]

CHBE 5805. Biomolecular Engineering and Design. Approaches for interrogating and controlling biological function on a molecular and cellular level. Applications to biotechnology fields such as diagnostics, therapeutics, and regenerative medicine. Focus areas include concepts of molecular recognition, extracellular and intracellular signal transduction, protein engineering, genome engineering, cellular engineering, and tissue engineering. [3]

CHBE 5810. Metabolic Engineering. (Also listed as CHBE 4810) Analysis and synthesis of metabolic networks using principles of thermodynamics, kinetics, and transport phenomena. Computational approaches for predicting metabolic phenotypes. Experimental techniques to measure and manipulate key metabolic variables including pathway fluxes, protein/gene expression, enzyme regulation, and intracellular metabolite concentrations. No credit for students who have earned credit for 4810. [3]

CHBE 5820. Immunoengineering. (Also listed as CHBE 4820) Approaches and technologies for manipulating and studying the immune system. Topics include fundamentals of immunology, immunology tools and methods, vaccines and immunotherapies, drug delivery principles, and materials engineering for immunomodulation. No credit for students who have earned credit for 4820. [3]

CHBE 5830. Molecular Simulation. (Also listed as CHBE 4830) Modern tools of statistical mechanics, such as Monte Carlo and molecular dynamics simulation, and variations. Methods, capabilities, and limitations of molecular simulation and applications to simple and complex fluids relevant to the chemical and related processing industries. No credit for students who have earned credit for 4830. [3]

CHBE 5840. Applications of Nanostructures. (Also listed as CHBE 4840) An engineering and materials science perspective on the physical and chemical properties of organic and inorganic nanostructures. Applications in nanomedicine for imaging and therapy, and in power systems for solar energy conversion and energy storage. No credit for students who have earned credit for 4840. SPRING. [3]

CHBE 5850. Semiconductor Materials Processing. (Also listed as CHBE 4850) Materials processing unit operations of silicon device manufacturing. Basic semiconductor physics and device theory, production of substrates, dopant diffusion, ion implantation, thermal oxidation and deposition processes, plasma deposition processes, photolithography, wet chemical and plasma etching, and analytical techniques. Lectures alternate with one two-hour laboratory on a weekly basis. No credit for students who have earned credit for 4850. FALL. [3]

CHBE 5860. Molecular Aspects of Chemical Engineering. (Also listed as CHBE 4860) Integration of molecular chemistry, property-based thermodynamic descriptions, and a focus on intermolecular energetics for process analysis and product design. Case studies involve molecular, macromolecular, supramolecular, and biomolecular systems. No credit for students who have earned credit for 4860. [3]

CHBE 5870. Polymer Science and Engineering. (Also listed as CHBE 4870) Macromolecular systems with emphasis on the interrelationship of chemical, physical, and engineering properties. Further relation of these properties to synthesis. Physicochemical and biological applications. No credit for students who have earned credit for 4870. [3]

CHBE 5880. Corrosion Science and Engineering. (Also listed as CHBE 4880) Aqueous-phase metal and alloy corrosion phenomena. Fundamental chemistry and electrochemistry theories, as applied to corroding systems. Specific forms of corrosion including pitting, crevice corrosion, and galvanic corrosion. Methods for corrosion control based on electrochemical fundamentals. No credit for students who have earned credit for 4880. SPRING [3]

CHBE 5890. Special Topics. (Also listed as CHBE 3890) No credit for students who have earned credit for 3890. [Variable credit: 1-3 each semester]

CHBE 6100. Applied Mathematics in Chemical Engineering. [Formerly CHBE 310] Chemical engineering applications of advanced mathematical methods. Analytical and numerical methods for ordinary and partial differential equations. Emphasis on recognizing the form of a mathematical model and possible solution methods. Applications in heat and mass transfer, chemical kinetics. FALL. [3]

CHBE 6110. Advanced Chemical Engineering Thermodynamics. [Formerly CHBE 311] Application of the thermodynamics method to chemical engineering problems. Development of the first, second, and third laws of thermodynamics; estimation and correlation of thermodynamic properties; chemical and phase equilibria; irreversible thermodynamics. FALL. [3]

CHBE 6120. Applied Chemical Kinetics. [Formerly CHBE 313] Experimental methods in kinetics. Kinetics of industrial reactions and reactor design. Absorption and catalytic systems are considered. FALL. [3]

CHBE 6200. Transport Phenomena. [Formerly CHBE 312] The theory of non-equilibrium processes. Development of the analogy between momentum, energy, and mass transport with applications to common engineering problems. SPRING. [3]

CHBE 6250. Professional Communication Skills for Engineers. [Formerly CHBE 395] Written and oral communication skills for engineers to produce peer-reviewed journal publications, research proposals, and research presentations. SPRING. [1]

CHBE 7899. Master of Engineering Project. [Formerly CHBE 389]. [0-6]

CHBE 7999. Master's Thesis Research. [Formerly CHBE 369] [0-6]

CHBE 8900. Special Topics. [Formerly CHBE 397] [Variable credit: 1-3 each semester]

CHBE 8991. Seminar. [Formerly CHBE 398] [0]

CHBE 8999. Non-Candidate Research. [Formerly CHBE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

CHBE 9999. Ph.D. Dissertation Research. [Formerly CHBE 399]

Civil Engineering

CE 2101. Civil and Environmental Engineering Information Systems. Information technologies used by civil and environmental engineers. Lab and project-oriented course focusing on developing skills in engineering drawings, computer graphics, plans reading, leveling, mapping, and GIS. Integration of CAD and surveying with team-based projects. FALL [3]

CE 2120. Sustainable Design in Civil Engineering. Concepts and methods of sustainability; resilience in civil engineering design. Best practices. Economic, social, and environmental analysis. Ratings, indices, and measurements. Local, regional, and federal policy. Challenges posed by climate change. Sustainability and resilience rating systems. Applications to development and design. FALL. [3]

CE 2200. Statics. [Formerly CE 180] Vector analysis of two- and three-dimensional equilibrium of particles, rigid bodies, trusses, frames, and machines. Internal forces, shear and moment diagrams, cables, centroids, moments of inertia, and friction. Credit offered for only one of CE 2200 or BME 2100. Corequisite: MATH 1301, PHYS 1601. FALL, SPRING, SUMMER [3]

CE 2205. Mechanics of Materials. [Formerly CE 182] Stress and strain; tension, compression, and shear; Hooke's law, Mohr's circle, combined stresses, strain-energy. Beams, columns, shafts, and continuous beams. Deflections, shear and moment diagrams. Prerequisite: CE 2200. FALL, SPRING, SUMMER. [3]

CE 3100W. Civil and Environmental Engineering Laboratory. [Formerly CE 205W] A team project-oriented course that integrates principles of engineering design, simulation, and experimentation as applied to civil engineering. Emphasis on experimental design, data analysis, and technical communication. Prerequisite: CE 2205. SPRING. [2]

CE 3200. Structural Analysis. [Formerly CE 232] Classification; nature of loads and their calculation; analysis of statically determinate and indeterminate beams, trusses, and frames using classical methods (integration, moment area, energy) and matrix methods; basics of nonlinear behavior; structural analysis software. Prerequisite: CE 2205. FALL. [3]

CE 3205. Structural Design. [Formerly CE 235] Loads and their identification; issues of safety and uncertainties; steel and concrete behavior and design of components in compression, tension, bending, shear; application to simple structural systems; use of the AISC Steel Specifications; sustainability issues. Prerequisite: CE 3200. SPRING [3]

CE 3250. Geotechnical Engineering. [Formerly CE 240] Origin, formation, identification, and engineering properties of soils. Discussion on index properties, soil moisture, soil structure, compressibility, shear strength, stress analysis, Rankine and Coulomb earth pressure theories and bearing capacity. Laboratory experiences. Graduate credit for earth and environmental sciences majors. Prerequisite: CE 2205. FALL. [3]

CE 3300. Risk, Reliability, and Resilience Engineering. Fundamental concepts in probability and statistical inference. Counting methods, discrete and continuous random variables, and their associated distributions. Sampling distributions, point estimation, confidence intervals, and hypothesis testing. Applications of probability and statistics to risk, reliability, and resilience of engineering systems. Prerequisite: MATH 2300. SPRING. [3]

CE 3501. Transportation Systems Engineering. [Formerly CE 225 and CE 3601] Planning, design, and operations of transportation systems. Particular emphasis on the design process, traffic engineering, urban transportation planning, the analysis of current transportation issues, and the ethics of transportation safety. SPRING. [3]

CE 3600. Environmental Engineering. [Formerly CE 226] Parameters affecting environmental quality, including air and water pollutants; treatment techniques to achieve drinking water quality or permit safe discharge to the environment. Sustainability. Contaminant transport and interactions of contaminants with the environment. Risk assessment and governmental regulations covering air, water, solid and hazardous wastes. Residuals management including hazardous and solid waste. Prerequisite: CHEM 1601, PHYS 1601, MATH 2420. FALL. [3]

CE 3700. Fluid Mechanics. [Formerly CE 203] Physical properties of fluids, fluid statics; integral and differential equations of conservation of mass, energy, and momentum; principles of real fluid flows: boundary layer effects, flow through pipes, flow in open channels, drag forces on bodies. Emphasis on civil and environmental engineering applications. Credit not awarded for both CE 3700 and ME 3224. Prerequisite: ME 2190, MATH 2420. FALL, SUMMER. [3]

CE 3700L. Fluid Mechanics Laboratory. [Formerly CE 204] Team project-oriented course. Practical applications of fluid mechanics principles through laboratory exercises and field trips. Corequisite: CE 3700. FALL. [1]

CE 3705. Water Resources Engineering. [Formerly CE 227] Engineering of water resources and sewerage systems that control the quantity, quality, timing, and distribution of water to support human habitation and the needs of the environment. Closed conduit flow, open channel flow, surface hydrology, groundwater hydrology, and contaminant transport. Prerequisite: CE 3700 or CHBE 3300 or ME 3224. SPRING. [3]

CE 3841. Directed Study. [Formerly CE 200A] Directed individual study of a pertinent topic in civil and environmental engineering. May include literature review and analysis, analytical investigations, and/or experimental work. Prerequisite: Junior standing, completion of two CE courses, and one-page proposal approved by supervising faculty member and chair. [1-3 each semester]

CE 3842. Directed Study. [Formerly CE 200B] Continuation of CE 3841 in the same or another area of civil and environmental engineering. Prerequisite: CE 3841 and one-page proposal approved by supervising faculty member and chair. [1-3 each semester]

CE 3843. Directed Study. [Formerly CE 200C] Continuation of CE 3842 in the same or another area of civil and environmental engineering. Prerequisite: CE 3842 and one-page proposal approved by supervising faculty member and chair. [1-3 each semester]

CE 3890. Special Topics. [Formerly CE 299] [3]

CE 4100. Geographic Information Systems (GIS). [Formerly CE 259] Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and internet delivery. Includes GIS software utilization and individual projects. SPRING. [3]

CE 4150. Energy Systems Engineering. Physical principles of energy conversion. Energy sources and usage. Sustainability and carrying capacity. Systems tools and economics for energy systems. Energy distribution and storage. Future energy system design. Prerequisite: MATH 2300. SPRING. [3]

CE 4200. Advanced Structural Steel Design. [Formerly CE 293] Advanced topics in column and beam design: elastic and inelastic analysis and design of continuous beams, composite beams, torsion design, behavior and design of bolted and welded connections, structural planning and design of structural systems such as multistory buildings. Prerequisite: CE 3205. FALL. [3]

CE 4205. Intelligent Transportation Systems. [Formerly CE 262] Elements of intelligent transportation system (ITS) architecture. Survey of component systems. Analysis of potential impacts. Field operational tests, analysis methods, deployment initiatives and results. SPRING. [3]

CE 4210. Advanced Reinforced Concrete Design. [Formerly CE 294] Design and behavior of two-way slab systems. Yield line theory. Shear and torsion analysis and design. Serviceability requirements and control of deflections of reinforced concrete systems. Prestressed concrete. Prerequisite: CE 3205. SPRING. [3]

CE 4211. Mechanics of Composite Materials. [Formerly CE 295] Review of constituent materials (reinforcements, matrices, and interfaces) and fabrication processes. Prediction of properties of unidirectional and short fiber materials (micromechanics). Anisotropic elasticity (derivation of Hooke's law for anisotropic materials, macromechanics of laminated composites). Analysis of laminated composites based on Classical Lamination Theory. Behavior of composite beams and plates. Special topics (creep, fracture, fatigue, impact, and environmental effects). Prerequisite: CE 2205, MSE 1500, MSE 1500L. SPRING. [3]

CE 4240. Infrastructure Systems Engineering. Systems-level approach to the infrastructure of the built environment. Elements of systems engineering. Case studies of infrastructure under duress. Smart infrastructure. Transportation, building, and water and wastewater supply and distribution systems. Infrastructure interdependencies and concepts of smart cities. Applications to infrastructure system design. FALL. [3]

CE 4250. Foundation Analysis and Design. [Formerly CE 251] Study of shallow and deep foundation elements and systems for civil engineering structures considering geotechnical, structural, and construction aspects. Corequisite: CE 3205. Prerequisite: CE 3250. SPRING. [3]

CE 4300. Reliability and Risk Case Studies. [Formerly CE 290] Review of historical events involving successes and failures in managing system reliability and risk from a wide range of perspectives, including design, production, operations, organizational culture, human factors and exogenous events. Analysis of risk factors leading to event occurrence, as well as event consequences in terms of impacts to public health, safety, security and environmental protection. Evaluation of risk mitigation strategies based on achievable goals, technical and political feasibility, and economic impact. Cases drawn from natural disasters, industrial accidents, and intentional acts. Prerequisite: Junior standing. FALL. [3]

CE 4320. Data Analytics for Engineers. Programming, analysis, and visualization of real data for the purposes of informing decision making in engineering problems. Statistical modeling in a practical and applied perspective; application of data analytics to bridge the gap between data and decisions; fundamentals of design of experiments. Prerequisite: CE 3300 or MATH 2810 or MATH 2820. FALL. [3]

CE 4340. Risk and Decision Analysis. Risk quantification, risk perception, decision-making under uncertainty, risk communication. Model risk and decisions using analytical and simulation approaches. Focus on theory and methodology, applications in engineering, environmental systems, business, and healthcare. Prerequisite: CE 3300 or MATH 2810 or MATH 2820. FALL. [3]

CE 4400. Construction Project Management. [Formerly CE 286] Theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Overview of the construction project from conception through completion. Application of management practices including planning, directing, cost minimizing, resource allocation, and control of all aspects of construction operations and resources. Credit given for only one of ENGM 3700, CE 4400, or EECE 4950. Prerequisite: CE 3205. FALL. [3]

CE 4401. Advanced Construction Project Management. [Formerly CE 289] Current and critical issues in the construction industry, including best practices developed at the Construction Industry Institute (CII). Guest lecturers include representatives of the CII and visiting industry leaders. Prerequisite: CE 4400. FALL. [3]

CE 4405. Construction Estimating. [Formerly CE 287] Estimation of material, labor, and equipment quantities, including costing and pricing of construction projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: CE 4400. FALL. [3]

CE 4410. Construction Planning and Scheduling. [Formerly CE 288] Fundamentals of construction planning and scheduling. Application of management practices including: process planning; directing, costing; resource allocation; and controlling all aspects of construction operations and resources, from pre-construction through operation and

maintenance. Use of real-world examples and project scheduling software. Prerequisite: CE 4400. SPRING. [3]

CE 4415. Construction Materials and Methods. [Formerly CE 291] Implications of design realities, material specifications, code limitations, and regulations on the construction process. Natural and man-made materials, construction techniques, and other issues that impact quality, constructability, and life-cycle assessment. SUMMER. [3]

CE 4420. Construction Law and Contracts. [Formerly CE 292] Review of case studies involving successes and failures in legal principles and landmark cases relevant to civil engineering and construction. Contracts, torts, agency and professional liability, labor laws, insurance, expert testimony, arbitration, patents and copyrights, sureties, and ethics. Prerequisite: CE 4400. SPRING. [3]

CE 4425. Building Information Modeling. [Formerly CE 296] Generation and management of building data during its life cycle. Three-dimensional, real-time, dynamic modeling to increase productivity in building design and construction. Considerations of building geometry, spatial relationships, geographic information, and building components. Corequisite: CE 4400. FALL. [3]

CE 4430. High Performance and Green Buildings. [Formerly CE 298] Design and construction of high performance buildings and related systems in buildings. Leadership in Energy and Environmental Design (LEED) green Building Rating System (TM) building approach to sustainability. Prerequisite: CE 4400. SPRING. [3]

CE 4500. Transportation Systems Design. [Formerly CE 255] Geometric analysis of transportation ways with particular emphasis on horizontal and vertical curve alignment and superelevation. Design of highways, interchanges, intersections, and facilities for pedestrians, and air, rail, and public transportation. Prerequisite: CE 3501 or 3601. SPRING. [3]

CE 4505. Urban Transportation Planning. [Formerly CE 256] Analytical methods and the decision-making process. Transportation studies, travel characteristic analysis, and land-use implications are applied to surface transportation systems. Emphasis is on trip generation, trip distribution, modal split, and traffic assignment. Planning processes in non-urban settings are also presented. Prerequisite: CE 3501 or CE 3601. SPRING [3]

CE 4510. Traffic Engineering. [Formerly CE 257] Analysis of the characteristics of traffic, including the driver, vehicle, volumes, capacities, congestion, roadway conditions, complete streets and accidents. Traffic regulations, markings, signing, signalization, and safety programs are also discussed. Prerequisite: CE 3501 or CE 3601. FALL. [3]

CE 4950. Civil Engineering Design I. [Formerly CE 248] A capstone design course for civil engineering students. Includes project conception, design, economic evaluations, safety, reliability, ethics, social and environmental impact, licensure, and government regulations. Projects may be interdisciplinary, competition-oriented, or traditional civil engineering projects. Prerequisite: CE 3100W. FALL [1].

CE 4951. Civil Engineering Design II. [Formerly CE 249] Continuation of CE 4950. The course involves an oral presentation and the submission of a final design report. Prerequisite: CE 4950. SPRING. [2]

CE 4959. Senior Engineering Design Seminar. Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: CE 4950. FALL. [1]

CE 5100. Geographic Information Systems (GIS). (Also listed as CE 4100) Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and internet delivery. Includes GIS software utilization and individual projects. No credit for students who have earned credit for 4100. SPRING. [3]

CE 5150. Energy Systems Engineering. (Also listed as CE 4150) Physical principles of energy conversion. Energy sources and usage. Sustainability and carrying capacity. Systems tools and economics for energy systems. Energy distribution and storage. Future energy system design. SPRING. [3]

CE 5200. Advanced Structural Steel Design. (Also listed as CE 4200) Advanced topics in column and beam design including local buckling, composite beams, plate girders, and torsion design. Behavior and design of bolted and welded connections. Structural planning and design of structural systems such as multistory buildings including computer applications. No credit for students who have earned credit for 4200. FALL. [3]

CE 5210. Advanced Reinforced Concrete Design. (Also listed as CE 4210) Design and behavior of two-way slab systems. Yield line theory. Shear and torsion analysis and design. Serviceability requirements and control of deflections of reinforced concrete systems. Prestressed concrete. No credit for students who have earned credit for 4210. SPRING. [3]

CE 5240. Infrastructure Systems Engineering. (Also listed as CE 4240) Systems-level approach to the infrastructure of the built environment. Elements of systems engineering. Case studies of infrastructure under duress. Smart infrastructure. Transportation, building, and water and wastewater supply and distribution systems. Infrastructure interdependencies and concepts of smart cities. Applications to infrastructure system design. FALL. [3]

CE 5250. Foundation Analysis and Design. (Also listed as CE 4250) Study of shallow and deep foundation elements and systems for civil engineering structures. Soil exploration and site investigation. No credit for students who have earned credit for 4250. SPRING. [3]

CE 5300. Reliability and Risk Case Stud. (Also listed as CE 4300) Review of historical events involving successes and failures in managing system reliability and risk from a wide range of perspectives, including design, production, operations, organizational culture, human factors and exogenous events. Analysis of risk factors leading to event occurrence, as well as event consequences in terms of impacts to public health, safety, security and environmental protection. Evaluation of risk mitigation strategies based on achievable goals, technical and political feasibility, and economic impact. Cases drawn from natural disasters, industrial accidents, and intentional acts. No credit for students who have earned credit for CE 4300. FALL. [3]

CE 5320. Data Analytics for Engineers. (Also listed as CE 4320) Programming, analysis, and visualization of real data for the purposes of informing decision making in engineering problems. Statistical modeling in a practical and applied perspective; application of data analytics to bridge the gap between data and decisions; fundamentals of design of experiments. No credit for students who have earned credit for CE 4320. FALL. [3]

CE 5340. Risk and Decision Analysis. (Also listed as CE 4340) Risk quantification, risk perception, decision-making under uncertainty, risk communication. Model risk and decisions using analytical and simulation approaches. Focus on theory and methodology, applications in engineering, environmental systems, business, and healthcare. No credit for students who have earned credit for CE 4340. FALL. [3]

CE 5400. Construction Project Management. (Also listed as CE 4400) Theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Overview of the construction project from conception through completion. Application of management practices including planning, directing, cost minimizing, resource allocation, and control of all aspects of construction operations and resources. No credit for students who have earned credit for 4400. FALL. [3]

CE 5401. Advanced Construction Project Management. (Also listed as CE 4401) Current and critical issues in the construction industry, including best practices developed at the Construction Industry Institute (CII). Guest lecturers include representatives of the CII and visiting industry leaders. No credit for students who have earned credit for 4401. FALL. [3]

CE 5405. Construction Estimating. (Also listed as CE 4405) Estimation of material, labor, and equipment quantities, including costing and pricing of construction projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: CE 5400. No credit for students who have earned credit for 4405. FALL. [3]

CE 5410. Construction Planning and Scheduling. (Also listed as CE 4410) Fundamentals of construction planning and scheduling. Application of management practices including: process planning; directing, costing; resource allocation; and controlling all aspects of construction operations and resources, from pre-construction through operation and maintenance. Use of real-world examples and project scheduling software. No credit for students who have earned credit for 4410. SPRING. [3]

CE 5415. Construction Materials and Methods. (Also listed as CE 4415) Implications of design realities, material specifications, code limitations, and regulations on the construction process. Natural and man-made materials, construction techniques, and other issues that impact quality, constructability, and life-cycle assessment. No credit for students who have earned credit for 4415. SUMMER. [3]

CE 5420. Construction Law and Contracts. (Also listed as CE 4420) Review of case studies involving successes and failures in legal principles and landmark cases relevant to civil engineering and construction. Contracts, torts, agency and professional liability, labor laws, insurance, expert testimony, arbitration, patents and copyrights, sureties, and ethics. No credit for students who have earned credit for 4420. SPRING. [3]

CE 5425. Building Information Modeling. (Also listed as CE 4425) Generation and management of building data during its life cycle. Three-dimensional, real-time, dynamic modeling to increase productivity in building design and construction. Considerations of building geometry, spatial relationships, geographic information, and building components. No credit for students who have completed 4425. FALL. [3]

CE 5430. High Performance and Green Buildings. (Also listed as CE 4430) Design and construction of high performance buildings and related systems in buildings. Leadership in Energy and Environmental Design (LEED) green Building Rating System (TM) building approach to sustainability. No credit for students who have earned credit for 4430. SPRING. [3]

CE 5500. Transportation System Design. (Also listed as CE 4500) Geometric analysis of transportation ways with particular emphasis on horizontal and vertical curve alignment. Design of highways, interchanges, intersections, and facilities for air, rail, and public transportation. No credit for students who have earned credit for 4500. SPRING. [3]

CE 5505. Urban Transportation Planning. (Also listed as CE 4505) Analytical methods and the decision-making process. Transportation studies, travel characteristic analysis, and land-use implications are applied to surface transportation systems. Emphasis is on trip generation, trip distribution, modal split, and traffic assignment. Computerized planning programs are used. No credit for students who have earned credit for 4505. SPRING. [3]

CE 5510. Traffic Engineering. (Also listed as CE 4510) Analysis of the characteristics of traffic, including the driver, vehicle, volumes, speeds, capacities, roadway conditions, and accidents. Traffic regulation, control, signing, signalization, and safety programs are also discussed. No credit for students who have earned credit for 4510. FALL. [3]

CE 5884. Internship. Internship working in a professional setting. Intended for M.Eng. students in the area of construction management. Corequisite: CE 5400. [0]

CE 5999. Special Topics. (Also listed as CE 3890) No credit for students who have earned credit for 3890. [3]

CE 6200. Continuum Mechanics. [Formerly CE 301] Mathematical preliminaries: tensor algebra, tensor calculus, coordinate transformation, principal values and directions. Kinematics of continuum: motion and deformation, infinitesimal and finite strain theory, balance of mass. Stress and integral formulations: traction on planes, stress invariants

and failure theories, Piola-Kirchhoff stress tensors, balance of momentum, stress power. Elastic solid: linear isotropic and anisotropic elasticity, engineering material constants, plane elastic waves, non-linear isotropic elasticity. FALL. [3].

CE 6205. Theory of Inelasticity. [Formerly CE 302] Physical mechanisms of deformation and failure. Modern theories of plasticity, viscoplasticity and continuum damage mechanics. Thermodynamics of plasticity and damage processes. Numerical and computational aspects of inelastic deformation mechanisms in solids and structures. SPRING. [3]

CE 6210. Finite Element Analysis. [Formerly CE 307] Discrete modeling of problems of the continua. Mathematical basis of finite element method-weighted residual and variational concepts. Finite element formulations; displacement, force, and mixed methods. 1-D problems of the continua and finite element solution-C0 and C1 elements, eigenvalue and transient problems. Error checks and control. Mapping, shape functions, numerical quadrature, and solution of equations. Formulation of 2-D problems (single and multi-field)-mapping and shape functions, triangular and quad elements with straight or curved boundaries. 3-D elements, singular problems, buckling, and nonlinear problems. Error estimation and quality control. Computer implementation. Commercial packages. Prerequisite: MATH 2410, MATH 3620. FALL. [3]

CE 6212. Advanced Computational Mechanics. [Formerly CE 308] Nonlinear mechanics, geometric and material nonlinearities. Discrete Lagrangian, Eulerian and other formulations. Nonlinear material models. Numerical solution algorithms in space and time. Solution of nonlinear (second-order and higher) problems. Multi-disciplinary problems. Error estimation and adaptive model improvement. Multi-scale modeling and atomistic/continuum coupling. Prerequisite: CE 6210. SPRING. [3]

CE 6215. Structural Dynamics and Control. [Formerly CE 309] Analysis of single- and multi-degree-of-freedom systems. Modal superposition method. Time and frequency domain analyses. Numerical methods and nonlinear dynamic analysis. Application to structures subject to earthquake and impact forces. Elements of feedback control systems. Control of lumped parameter systems. Active, passive, and hybrid mass dampers. Application to simple building and bridge structures. SPRING. [3]

CE 6300. Probabilistic Methods in Engineering Design. [Formerly CE 310] Applications of probabilistic methods in the analysis and synthesis of engineering systems. Review of basic probability concepts, random variables and distributions, modeling and quantification of uncertainty, testing the validity of assumed models, linear regression and correlation analyses, Monte Carlo simulation, reliability analysis and reliability-based design. Prerequisite: MATH 2410. FALL. [3]

CE 6305. Engineering Design Optimization. [Formerly CE 311] Methods for optimal design of engineering systems. Optimization under uncertainty, reliability-based design optimization, robust design, multidisciplinary problems, multi-objective optimization. Discrete and continuous design variables, advanced numerical algorithms, and formulations and strategies for computational efficiency. Practical applications and term projects in the student's area of interest. Prerequisite: MATH 4630, MATH 4620 or CE 6300. [3]

CE 6310. Uncertainty Quantification. [Formerly CE 313] Computational methods for analysis and design of modern engineering systems under uncertainty. Emphasis on epistemic uncertainty due to data and models. Topics include stochastic finite elements; time-dependent reliability; Bayesian methods and networks; surrogate modeling; advanced simulation; global sensitivity analysis; model verification, validation, and calibration; and optimization under uncertainty. Applications to practical engineering systems. Prerequisite: CE 6300. SPRING. [3]

CE 6313. Multiscale Modeling. [Formerly CE 314] State-of-the-art and emerging multiscale computational methods for modeling of mechanics, transport, and materials phenomena. Principles of information transfer between multiple spatial and temporal scales, including atomistic-to-continuum coupling, continuum-to-continuum coupling, and bridging of time scales. Enrichment methods including generalized finite elements, partition of unity, variational multiscale methods. FALL. [3]

CE 6318. Prestressed Concrete. [Formerly CE 318] Behavior and design of statically determinate prestressed concrete structures under bending moment, shear, torsion, and axial load effects. Design of statically determinate prestressed structures such as continuous beams, frames, slabs and shells. Creep and shrinkage effects and deflections of prestressed concrete structures. Application to the design and construction of bridges and buildings. Prerequisite: CE 3205. [3]

CE 6351. Public Transportation Systems. [Formerly CE 351] Comprehensive study of public transportation, with emphasis on planning, management, and operations; paratransit, ridesharing, and rural public transportation systems. Prerequisite: CE 4505. SPRING. [3]

CE 6353. Airport Planning and Design. [Formerly CE 353] Integration and application of the principles of airport master planning from the beginning stages of site selection through actual design of an airport facility. Specific study topics address demand forecasting, aircraft characteristics, capacity analyses, and geometric design of runways, terminals, and support facilities. Prerequisite: CE 3601. [3]

CE 6355. Advanced Transportation Design. [Formerly CE 355] In-depth view of the transportation design process. Complex transportation design problems and solutions, with the use of computer-based analytical design tools. Comprehensive design projects. Prerequisite: CE 4500. SPRING [3]

CE 6356. Advanced Transportation Planning. [Formerly CE 356] A continuation of the concepts from CE 4505, with emphasis on analytical techniques used in forecasting travel. Use of computer-based models, along with transportation and energy contingency planning methods. Prerequisite: CE 4505. SPRING [3]

CE 6357. Theory of Traffic Flow. [Formerly CE 357] A study of traffic flow from the perspective of probability as applied to highway, intersection and weaving capacities. Discrete and continuous flow, vehicle distributions, queuing, and simulation. Prerequisite: CE 4510. [3]

CE 6359. Emerging Information Systems Applications. [Formerly CE 359] Role of emerging information systems technologies in improving productivity and efficiency and in managing engineering operations. Design of integrated approaches to enhance the speed, accuracy, reliability, and quantity of information available for decision support. Emphasis on case studies of innovative applications in transportation and manufacturing, leading to individual and group projects requiring new product development. Prerequisite: Background in transportation or manufacturing operations. FALL. [3]

CE 7899. Master of Engineering Project. [Formerly CE 389]

CE 7999. Master's Thesis Research. [Formerly CE 369] [0-6]

CE 8000. Individual Study of Civil Engineering Problems. [Formerly CE 325A] Literature review and analysis of special problems under faculty supervision. FALL, SPRING, SUMMER. [1-4 each semester]

CE 8001. Individual Study of Civil Engineering Problems. [Formerly CE 325B] Literature review and analysis of special problems under faculty supervision. FALL, SPRING, SUMMER. [1-4 each semester]

CE 8002. Individual Study of Civil Engineering Problems. [Formerly CE 325C] Literature review and analysis of special problems under faculty supervision. FALL, SPRING, SUMMER. [1-4 each semester]

CE 8300. Reliability and Risk Engineering Seminar. [Formerly CE 371A] Perspectives on reliability and risk assessment and management of multi-disciplinary engineering systems. Topics on infrastructure and environmental systems, mechanical, automotive, and aerospace systems; network systems (power distribution, water and sewage systems, transportation etc.); manufacturing and construction; and electronic and software systems. FALL, SPRING. [1]

CE 8301. Reliability and Risk Engineering Seminar. [Formerly CE 371B] Seminars by expert speakers provide a wide range of perspectives on reliability and risk assessment and management of multidisciplinary engineering systems. Topics on infrastructure and environmental systems; mechanical, automotive, and aerospace systems; network systems (power distribution, water and sewage systems, transportation,

etc.); manufacturing and construction; and electronic and software systems. FALL, SPRING. [1]

CE 8999. Non-Candidate Research. [Formerly CE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

CE 9999. Ph.D. Dissertation Research. [Formerly CE 399]

Environmental Engineering

ENVE 3610. Sustainable Development. [Formerly ENVE 220A] Quantitative investigation of the role of adequate and renewable resources for continual economic development. Past and present resource challenges, influences of indigenous, national, and international cultures, land use practices, social policy, and economic strategies on infrastructure development. Future challenges posed by climate change, and how market- and government-based policies may be applied in conditions of uncertainty to encourage sustainable development. SPRING. [3]

ENVE 4305. Enterprise Risk Management. [Formerly ENVE 296] Development of an organization-wide risk management program for protecting human health, the environment and business continuity. Focus on defining an all-hazards risk management process and program implementation, performing risk assessments, determining and selecting appropriate risk reduction strategies, and influencing risk management decisions internally and externally. Applications drawn from natural disasters, man-made accidents and intentional acts. Prerequisite: Senior standing. SPRING. [3]

ENVE 4600. Environmental Chemistry. [Formerly ENVE 271] Theoretical aspects of physical, organic, and inorganic chemistry applied to environmental engineering. Estimation of chemical parameters based on thermodynamic and structural activity relationships, kinetics of chemical reactions, equilibrium processes in the environment, including the carbonate system, metal complexation and precipitation. Prerequisite: CHEM 1602. FALL. [3]

ENVE 4605. Environmental Thermodynamics, Kinetics, and Mass Transfer. [Formerly ENVE 270] Examination of fundamental environmental processes and phenomena. Uses of equilibrium phenomena, process rate and mass transport phenomena to solve a broad range of environmental problems. Prerequisite: CHEM 1602, MATH 2420, CE 3600. SPRING. [3]

ENVE 4610. Biological Processes in Environmental Systems. [Formerly ENVE 272] Principles of biology and their application to wastewater treatment processes with emphasis on microbial ecology, bioenergetics, and the role of chemical structure in biodegradability. Utilization kinetics of inhibitory and non-inhibitory organic compounds. Biological process analysis and design (aerobic and anaerobic) for municipal and industrial wastewaters, using a mass balance approach. SPRING. [3]

ENVE 4615. Environmental Assessments. [Formerly ENVE 264] Design and conduct of environmental assessments to evaluate risks posed by infrastructure systems or environmental contamination. Impact analyses for sources, infrastructure modifications, due diligence environmental audits, and contaminated site remedial investigations. Prerequisite: Senior standing. FALL. [3]

ENVE 4620. Environmental Characterization and Analysis. [Formerly ENVE 273] Acquisition and interpretation of environmental data. Principles of chemical measurement, sample collection and sample program design; laboratory safety and good laboratory practices; analytical instrumentation and methods; quality assurance and quality control; and statistical interpretation of data. Hands-on experience through demonstrations featuring state-of-the-art analytical instrumentation. Prerequisite: CE 3600, ENVE 4600. SPRING. [3]

ENVE 4625. Environmental Separations Processes. [Formerly ENVE 277 and ENVE 4716] Fundamentals and applications of separations processes relevant to water and wastewater treatment and other environmental systems. Topics include coagulation/flocculation, sedimentation, granular filtration; advanced separation processes such as various

membrane processes, absorption, ion exchange, thermally driven separations, and electrically driven separations including electrodialysis and capacitive deionization. SPRING. [3]

ENVE 4700. Energy and Water Resources. [Formerly ENVE 254] Scientific, technological, philosophical, and social issues surrounding approaches to carbon-based energy and alternative energy resources, management of carbon through sequestration, supplying and treating water for agriculture, communities, and industry, and changing climate impacts on regional distribution of water resources. SPRING. [3]

ENVE 4705. Physical Hydrology. [Formerly ENVE 252] Development of fundamental bases of hydrological processes. Land-atmosphere processes, surface-water flows, soil moisture dynamics, and groundwater flows. Exposition of physical principles, their embodiment in mathematical models, and their use in interpreting observations in the field and laboratory. Prerequisite: CE 3700 or ME 3224 or ChBE 3300 or EES 4550. FALL. [3]

ENVE 4710. Hydrology. [Formerly ENVE 262] The hydrologic cycle, study of precipitation, evapotranspiration, hydrometeorology, stream flow, flood flow, flood routing, storm sewer design, detention basin design, and water quality. Prerequisite: CE 3700, CE 3705. FALL. [3]

ENVE 4715. Groundwater Hydrology. [Formerly ENVE 276] The occurrence and flow of ground water. Basic concepts of the effects of varying permeability and capillarity on seepage flow. Flow toward wells, through dikes, and beneath dams. Prerequisite: MATH 2420, CE 3700. SPRING. [3]

ENVE 4720. Surface Water Quality Modeling. [Formerly ENVE 274] Analysis of physical, chemical, biological, and physiological contaminants in streams, lakes, and estuaries, and surface water/groundwater interfaces. Analytical and numerical modeling techniques. One- and two-dimension computer simulation of surface water quality. Prerequisite: ENVE 4605. SPRING. [3]

ENVE 4800. Nuclear Environmental Engineering. [Formerly ENVE 285] The nuclear fuel cycle and environmental and societal impacts associated with its traditional implementation. Technical and programmatic challenges associated with fuel production, and waste management including processing, storage, transportation, decontamination, decommissioning, and environmental restoration. Technologies and approaches for reducing impacts of the nuclear fuel cycle. Prerequisite: Senior or graduate standing. SPRING. [3]

ENVE 5305. Enterprise Risk Management. (Also listed as ENVE 4305) Development of an organization-wide risk management program for protecting human health, the environment and business continuity. Focus on defining an all-hazards risk management process and program implementation, performing risk assessments, determining and selecting appropriate risk reduction strategies, and influencing risk management decisions internally and externally. Applications drawn from natural disasters, man-made accidents and intentional acts. No credit for students who have earned credit for ENVE 4305. SPRING. [3]

ENVE 5600. Environmental Chemistry. (Also listed as ENVE 4600) Theoretical aspects of physical, organic, and inorganic chemistry applied to environmental engineering. Estimation of chemical parameters based on thermodynamic and structural activity relationships, kinetics of chemical reactions, equilibrium processes in the environment, including the carbonate system, metal complexation and precipitation. No credit for students who have earned credit for 4600. FALL. [3]

ENVE 5605. Environmental Thermodynamics, Kinetics, and Mass Transfer. (Also listed as ENVE 4605) Examination of fundamental environmental processes and phenomena that provide the analytical tools necessary to solve a broad range of environmental problems. These tools include equilibrium phenomena, process rate and mass transport phenomena. No credit for students who have earned credit for 4605. SPRING. [3]

ENVE 5610. Biological Processes in Environmental Systems. (Also listed as ENVE 4610) Principles of biology and their application to wastewater treatment processes with emphasis on microbial ecology, bioenergetics, and the role of chemical structure in biodegradability. Utilization kinetics of inhibitory and non-inhibitory organic compounds. Biological

process analysis and design (aerobic and anaerobic) for municipal and industrial wastewaters, using a mass balance approach. No credit for students who have earned credit for ENVE 4610. SPRING. [3]

ENVE 5615. Environmental Assessments. (Also listed as ENVE 4615) Design and conduct of environmental assessments to evaluate risks posed by infrastructure systems or environmental contamination. Impact analyses for sources, infrastructure modifications, due diligence environmental audits, and contaminated site remedial investigations. No credit for students who have earned credit for 4615. FALL. [3]

ENVE 5620. Environmental Characterization and Analysis. (Also listed as ENVE 4620) Acquisition and interpretation of environmental data. Principles of chemical measurement, sample collection and sample program design; laboratory safety and good laboratory practices; analytical instrumentation and methods; quality assurance and quality control; and statistical interpretation of data. Hands-on experience through demonstrations featuring state-of-the-art analytical instrumentation. No credit for students who have earned credit for 4620. SPRING. [3]

ENVE 5625. Environmental Separations Processes. (Also listed as ENVE 4625) Fundamentals and applications of separations processes relevant to water and wastewater treatment and other environmental systems. Topics include coagulation/flocculation, sedimentation, granular filtration; advanced separation processes such as various membrane processes, absorption, ion exchange, thermally driven separations, and electrically driven separations including electrodialysis and capacitive deionization. No credit for students who have earned credit for ENVE 4625. SPRING. [3]

ENVE 5700. Energy and Water Resources. (Also listed as ENVE 4700) Scientific, technological, philosophical, and social issues surrounding approaches to carbon-based energy and alternative energy resources, management of carbon through sequestration, supplying and treating water for agriculture, communities, and industry, and changing climate impacts on regional distribution of water resources. No credit for students who have earned credit for 4700. SPRING. [3]

ENVE 5705. Physical Hydrology. (Also listed as ENVE 4705) Development of fundamental bases of hydrological processes. Land-atmosphere processes, surfacewater flows, soil moisture dynamics, and groundwater flows. Exposition of physical principles, their embodiment in mathematical models, and their use in interpreting observations in the field and laboratory. No credit for students who have earned credit for 4705. FALL. [3]

ENVE 5710. Hydrology. (Also listed as ENVE 4710) The hydrologic cycle, study of precipitation, evapotranspiration, hydrometeorology, stream flow, flood flow, flood routing, storm sewer design, detention basin design, and water quality. No credit for students who have earned credit for 4710. FALL. [3]

ENVE 5715. Groundwater Hydrology. (Also listed as ENVE 4715) The occurrence and flow of ground water. Basic concepts of the effects of varying permeability and capillarity on seepage flow. Flow toward wells, through dikes, and beneath dams. No credit for students who have earned credit for 4715. SPRING. [3]

ENVE 5720. Surface Water Quality Modeling. (Also listed as ENVE 4720) Analysis of physical, chemical, biological, and physiological contaminants in streams, lakes, and estuaries, and surface water/groundwater interfaces. Analytical and numerical modeling techniques. One- and two-dimension computer simulation of surface water quality. No credit for students who have earned credit for 4720. SPRING. [3]

ENVE 5800. Nuclear Environmental Engineering. (Also listed as ENVE 4800) The nuclear fuel cycle and environmental and societal impacts associated with its traditional implementation. Technical and programmatic challenges associated with fuel production, and waste management including processing, storage, transportation, decontamination, decommissioning, and environmental restoration. Technologies and approaches for reducing impacts of the nuclear fuel cycle. No credit for students who have earned credit for 4800. SPRING. [3]

ENVE 6800. Nuclear Facilities Life Cycle Engineering. [Formerly ENVE 330] The life cycle (including siting, licensing, construction, operations

and decommissioning) of the nuclear facilities that comprise the nuclear fuel cycle—from mining uranium ore through the potential recycling of used nuclear fuel. SPRING. [3]

ENVE 6805. Storage, Treatment and Disposal of Radioactive Waste. [Formerly ENVE 332] Evolution of current domestic and international approaches, including waste forms, classification, storage and disposal locations, and environmental and safety assessments. FALL. [3]

ENVE 7531. Nuclear Chemistry and Processes. [Formerly ENVE 331] Chemistry and chemical processing of the actinides and important fission products and byproducts. Development of nuclear chemical engineering processes for these materials. SPRING. [3]

ENVE 7533. Nuclear Process Safety. [Formerly ENVE 333] Approaches for evaluating the safety of nuclear radiochemical processing systems. Safety analysis practices from the chemical industry, the nuclear power community, and the United States nuclear weapons complex, and other quantitative and qualitative risk assessment methods. FALL. [3]

ENVE 7534. Nuclear Environmental Regulation, Law and Practice. [Formerly ENVE 334] Environmental laws and regulations governing radionuclides and radioactive waste, including those concerning hazardous chemicals and wastes and those impacting commercial nuclear fuel cycle facilities and former nuclear weapons and materials sites. Interplay between regulatory agencies such as the US Nuclear Regulatory Commission, the US Environmental Protection Agency, and the states. Self-regulation of activities by the U.S. Department of Energy. SUMMER. [3]

ENVE 7899. Master of Engineering Project. [Formerly ENVE 389]

ENVE 7999. Master's Thesis Research. [Formerly ENVE 369] [0-6]

ENVE 8000. Individual Study. [Formerly ENVE 325A] Literature review and analysis, or laboratory investigation of special problems under faculty supervision. FALL, SPRING, SUMMER. [Variable credit: 1-4 each semester]

ENVE 8001. Individual Study. [Formerly ENVE 325B] Literature review and analysis, or laboratory investigation of special problems under faculty supervision. FALL, SPRING, SUMMER. [Variable credit: 1-4 each semester]

ENVE 8002. Individual Study. [Formerly ENVE 325C] Literature review and analysis, or laboratory investigation of special problems under faculty supervision. FALL, SPRING, SUMMER. [Variable credit: 1-4 each semester]

ENVE 8300. Research Methods Seminar. Coverage of graduate-level skills required to conduct critical review of a topic and produce research proposals, research presentations, and peer-reviewed journal publications. Includes discussion of responsible conduct in research and ethics. FALL. [0]

ENVE 8999. Non-Candidate Research. [Formerly ENVE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

ENVE 9999. Ph.D. Dissertation Research. [Formerly ENVE 399]

Computer Science

CS 1000. The Beauty and Joy of Computing. Fundamental concepts of computing including abstraction, algorithms, design, and distributed computation. Hands-on curriculum focusing on translating ideas into working computer programs and developing a mastery of practical computational literacy. The relevance and societal impact of computer science are emphasized. Students in the School of Engineering may only receive open elective credit for CS 1000. FALL, SPRING. [3]

CS 1101. Programming and Problem Solving. [Formerly CS 101] An intensive introduction to algorithm development and problem solving on the computer. Structured problem definition, top down and modular algorithm design. Running, debugging, and testing programs. Program documentation. Not open to students who have earned credit for CS 1104 without permission. Total credit for this course and CS 1104 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. FALL, SPRING. [3]

CS 1103. Introductory Programming for Engineers and Scientists. [Formerly CS 103] Problem solving on the computer. Intended for students other than computer science and computer engineering majors. Methods for designing programs to solve engineering and science problems using MATLAB. Generic programming concepts. FALL, SPRING. [3]

CS 1104. Programming and Problem Solving with Python. An intensive introduction to algorithm development and problem solving using the Python programming language. Structured problem definition, top down and modular algorithm design. Running, debugging, and testing programs. Program documentation. Not open to students who have earned credit for CS 1101 without permission. Total credit for this course and CS 1101 will not exceed 3 credit hours. Credit hours reduced from second course taken (or from test or transfer credit) as appropriate. FALL, SPRING. [3]

CS 1151. Computers and Ethics. [Formerly CS 151] Analysis and discussion of problems created for society by computers, and how these problems pose ethical dilemmas to both computer professionals and computer users. Topics include: computer crime, viruses, software theft, ethical implications of life-critical systems. FALL, SPRING. [3]

CS 2201. Program Design and Data Structures. [Formerly CS 201] Continuation of CS 1101. The study of elementary data structures, their associated algorithms and their application in problems; rigorous development of programming techniques and style; design and implementation of programs with multiple modules, using good data structures and good programming style. Prerequisite: CS 1101 or 1104. FALL, SPRING. [3]

CS 2204. Program Design and Data Structures for Scientific Computing. [Formerly CS 204] Data structures and their associated algorithms in application to computational problems in science and engineering. Time and memory complexity; dynamic memory structures; sorting and searching; advanced programming and program-solving strategies; efficient software library use. Prerequisite: CS 1104. SPRING. [3]

CS 2212. Discrete Structures. [Formerly CS 212] Survey of the mathematical tools necessary for an understanding of computer science. Sets, relations, functions, basic counting techniques, permutations, combinations, graphs, recurrence relations, simple analysis of algorithms, O-notation, Boolean algebra, propositional calculus, and numeric representation. Prerequisite: A course in computer science or two semesters of calculus. FALL, SPRING. [3]

CS 2231. Computer Organization. [Formerly CS 231] The entire hierarchical structure of computer architecture, beginning at the lowest level with a simple machine model (e.g., a simple von Neumann machine). Processors, process handling, IO handling, and assembler concepts. Graduate credit not given for computer science majors. Prerequisite: CS 2201. Corequisite: EECE 2116, EECE 2116L. FALL, SPRING. [3]

CS 3250. Algorithms. [Formerly CS 250] Advanced data structures, systematic study and analysis of important algorithms for searching; sorting; string processing; mathematical, geometrical, and graph algorithms, classes of P and NP, NP-complete and intractable problems. Prerequisite: CS 2201, CS 2212. FALL, SPRING. [3]

CS 3251. Intermediate Software Design. [Formerly CS 251] High quality development and reuse of architectural patterns, design patterns, and software components. Theoretical and practical aspects of developing, documenting, testing, and applying reusable class libraries and object-oriented frameworks using object-oriented and component-based programming languages and tools. Prerequisite: CS 2201. FALL, SPRING [3]

CS 3252. Theory of Automata, Formal Languages, and Computation. [Formerly CS 252] Finite-state machines and regular expressions. Context-free grammars and languages. Pushdown automata. Turing machines. Undecidability. The Chomsky hierarchy. Computational complexity. Prerequisite: CS 2212. SPRING. [3]

CS 3258. Computer Graphics. [Formerly CS 258] 2D rendering and image-based techniques, 2D and 3D transformations, modeling, 3D rendering, graphics pipeline, ray-tracing, and texture-mapping. Prerequisite: MATH 2400, 2410, 2501 or 2600; CS 3251. SPRING. [3]

CS 3259. Project in Computer Animation Design and Technology.

[Formerly CS 259] Principles and techniques of computer animation. Topics include storyboarding, camera control, skeletons, inverse kinematics, splines, keyframing, motion capture, dynamic simulation, particle systems, facial animation, and motion perception. Students work in groups on the design, modeling, animation, and rendering of a computer animation project. Prerequisite: MATH 2400, 2410, 2501, or 2600; CS 2201. FALL. [3]

CS 3265. Database Management Systems. [Formerly CS 265] Logical and physical organization of databases. Data models and query languages, with emphasis on the relational model and its semantics. Data independence, security, integrity, concurrency. Prerequisite: CS 2201. [3]

CS 3270. Programming Languages. [Formerly CS 270] General criteria for design, implementation, and evaluation of programming languages. Historical perspective. Syntactic and semantic specification, compilations, and interpretation processes. Comparative studies of data types and data control, procedures and parameters, sequence control, nesting, scope and storage management, run-time representations. Problem solving using non-standard languages. Prerequisite: CS 2201, CS 2231 or EECE 2123. FALL, SPRING. [3]

CS 3274. Modeling and Simulation. [Formerly CS 274] General theory of modeling and simulation of a variety of systems: physical processes, computer systems, biological systems, and manufacturing processes. Principles of discrete-event, continuous, and hybrid system modeling, simulation algorithms for the different modeling paradigms, methodologies for constructing models of a number of realistic systems, and analysis of system behavior. Computational issues in modeling and analysis of systems. Stochastic simulations. Prerequisite: CS 2201. [3]

CS 3276. Compiler Construction. [Formerly CS 276] Review of programming language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions and statements. Organization of a compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design. Use of a high-level language to write a complete compiler. Prerequisite: CS 3270. [3]

CS 3281. Principles of Operating Systems I. [Formerly CS 281] Resource allocation and control functions of operating systems. Scheduling of processes and processors. Concurrent processes and primitives for their synchronization. Use of parallel processes in designing operating system subsystems. Methods of implementing parallel processes on conventional computers. Virtual memory, paging, protection of shared and non-shared information. Structures of data files in secondary storage. Security issues. Case studies. Prerequisite: CS 2231 or EECE 2123, CS 3251. FALL, SPRING. [3]

CS 3282. Principles of Operating Systems II. [Formerly CS 282] Projects involving modification of a current operating system. Lectures on memory management policies, including virtual memory. Protection and sharing of information, including general models for implementation of various degrees of sharing. Resource allocation in general, including deadlock detection and prevention strategies. Operating system performance measurement, for both efficiency and logical correctness. Two hours lecture and one hour laboratory. Prerequisite: CS 3281. [3]

CS 3860. Undergraduate Research. [Formerly CS 240A] Open to qualified majors with consent of instructor and adviser. No more than 6 hours may be counted towards the computer science major. Prerequisite: CS 2231 or EECE 2123. [1-3 each semester]

CS 3861. Undergraduate Research. [Formerly CS 240B] Open to qualified majors with consent of instructor and adviser. No more than 6 hours may be counted towards the computer science major. Prerequisite: CS 2231 or EECE 2123. [1-3 each semester]

CS 3891. Special Topics. [Formerly CS 291] [Variable credit: 1-3 each semester]

CS 3892. Special Topics. CS 3892. Special Topics. [Formerly CS 292] Fulfills project course requirement in CS major. [3]

CS 4260. Artificial Intelligence. [Formerly CS 260] Principles and programming techniques of artificial intelligence. Strategies for searching, representation of knowledge and automatic deduction, learning, and adaptive systems. Survey of applications. Prerequisite: CS 3250, CS 3251; MATH 2810 or 2820 or 3640. FALL. [3]

CS 4262. Foundations of Machine Learning. Theoretical and algorithmic foundations of supervised learning, unsupervised learning, and reinforcement learning. Linear and nonlinear regression, kernel methods, support vector machines, neural networks and deep learning methods, instance-based methods, ensemble classifiers, clustering and dimensionality reduction, value and policy iteration. Explainable AI, ethics, and data privacy. Prerequisite: CS 3251; one of MATH 2810, 2820, or 3640; one of MATH 2410, 2500, 2501, or 2600. SPRING. [3]

CS 4266. Topics in Big Data. Principles and practices of big data processing and analytics. Data storage databases and data modeling techniques, data processing and querying, data analytics and applications of machine learning using these systems. Prerequisite: CS 3251. SPRING. [3]

CS 4269. Project in Artificial Intelligence. [Formerly CS 269] Students work in small groups on the specification, design, implementation, and testing of a sizeable AI software project. Projects (e.g., an "intelligent" game player) require that students address a variety of AI subject areas, notably heuristic search, uncertain reasoning, planning, knowledge representation, and learning. Class discussion highlights student progress, elaborates topics under investigation, and identifies other relevant topics (e.g., vision) that the project does not explore in depth. Prerequisite: CS 4260. SPRING. [3]

CS 4278. Principles of Software Engineering. [Formerly CS 278] The nature of software. The object-oriented paradigm. Software life-cycle models. Requirements, specification, design, implementation, documentation, and testing of software. Object-oriented analysis and design. Software maintenance. Prerequisite: CS 3251. FALL. [3]

CS 4279. Software Engineering Project. [Formerly CS 279] Students work in teams to specify, design, implement, document, and test a nontrivial software project. The use of CASE (Computer Assisted Software Engineering) tools is stressed. Prerequisite: CS 4278. SPRING. [3]

CS 4283. Computer Networks. [Formerly CS 283] Computer communications. Network (Internet) architecture. Algorithms and protocol design at each layer of the network stack. Cross-layer interactions and performance analysis. Network simulation tools. Lab and programming assignments. Credit given for only one of CS 4283 or EECE 4371. Prerequisite: CS 3281 or EECE 4376. [3]

CS 4284. Computer Systems Analysis. [Formerly CS 284] Techniques for evaluating computer system performance with emphasis upon application. Topics include measurement and instrumentation techniques, benchmarking, simulation techniques, elementary queuing models, data analysis, operation analysis, performance criteria, case studies. Project involving a real computer system. Prerequisite: CS 3281. [3]

CS 4285. Network Security. [Formerly CS 285] Principles and practice of network security. Security threats and mechanisms. Cryptography, key management, and message authentication. System security practices and recent research topics. Prerequisite: CS 4283. [3]

CS 4287. Principles of Cloud Computing. Fundamental concepts of cloud computing, different service models, techniques for resource virtualization, programming models, management, mobile cloud computing, recent advances, and hands-on experimentation. Prerequisite: CS 3281. [3]

CS 4288. Web-based System Architecture. Core concepts necessary to architect, build, test, and deploy complex web-based systems; analysis of key domain requirements in security, robustness, performance, and scalability. Prerequisite: CS 3251. FALL. [3]

CS 4959. Computer Science Seminar. [Formerly CS 297] Elements of professional engineering practice, professional education and lifelong learning, intellectual property and software patents, open source and crowd source software development, liability, soft risk safety and security, privacy issues, interdisciplinary teams and team tools, professional

organization, careers, entrepreneurship, human computer interaction. Prerequisite: CS 3251. FALL [1]

CS 5250. Algorithms. (Also listed as CS 3250) Advanced data structures, systematic study and analysis of important algorithms for searching; sorting; string processing; mathematical, geometrical, and graph algorithms, classes of P and NP, NP-complete and intractable problems. No credit for students who have earned credit for 3250. FALL, SPRING. [3]

CS 5251. Intermediate Software Design. (Also listed as CS 3251) High quality development and reuse of architectural patterns, design patterns, and software components. Theoretical and practical aspects of developing, documenting, testing, and applying reusable class libraries and object-oriented frameworks using object-oriented and component-based programming languages and tools. No credit for students who have earned credit for 3251. FALL, SPRING [3]

CS 5252. Theory of Automata, Formal Languages, and Computation. (Also listed as CS 3252) Finite-state machines and regular expressions. Context-free grammars and languages. Pushdown automata. Turing machines. Undecidability. The Chomsky hierarchy. Computational complexity. No credit for students who have earned credit for 3252. SPRING. [3]

CS 5258. Computer Graphics. (Also listed as CS 3258) 2D rendering and image-based techniques, 2D and 3D transformations, modeling, 3D rendering, graphics pipeline, ray-tracing, and texture-mapping. No credit for students who have earned credit for 3258. FALL. [3]

CS 5259. Project in Computer Animation Design and Technology. (Also listed as CS 3259) Principles and techniques of computer animation. Storyboarding, camera control, skeletons, inverse kinematics, splines, keyframing, motion capture, dynamic simulation, particle systems, facial animation, and motion perception. Students work in groups on the design, modeling, animation, and rendering of a computer animation project. No credit for students who have earned credit for 3259. FALL. [3]

CS 5260. Artificial Intelligence. (Also listed as CS 4260) Principles and programming techniques of artificial intelligence. Strategies for searching, representation of knowledge and automatic deduction, learning, and adaptive systems. Survey of applications. No credit for students who have earned credit for 4260. FALL. [3]

CS 5262. Foundations of Machine Learning. Theoretical and algorithmic foundations of supervised learning, unsupervised learning, and reinforcement learning. Linear and nonlinear regression, kernel methods, support vector machines, neural networks and deep learning methods, instance-based methods, ensemble classifiers, clustering and dimensionality reduction, value and policy iteration. Explainable AI, ethics, and data privacy. SPRING. [3]

CS 5265. Database Management Systems. (Also listed as CS 3265) Logical and physical organization of databases. Data models and query languages, with emphasis on the relational model and its semantics. Data independence, security, integrity, concurrency. No credit for students who have earned credit for 3265. [3]

CS 5266. Topics in Big Data. Principles and practices of big data processing and analytics. Data storage databases and data modeling techniques, data processing and querying, data analytics and applications of machine learning using these systems. SPRING. [3]

CS 5269. Project in Artificial Intelligence. (Also listed as CS 4269) Students work in small groups on the specification, design, implementation, and testing of a sizeable AI software project. Projects (e.g., an "intelligent" game player) require that students address a variety of AI subject areas, notably heuristic search, uncertain reasoning, planning, knowledge representation, and learning. Class discussion highlights student progress, elaborates topics under investigation, and identifies other relevant topics (e.g., vision) that the project does not explore in depth. No credit for students who have earned credit for 4269. SPRING. [3]

CS 5270. Programming Languages. (Also listed as CS 3270) General criteria for design, implementation, and evaluation of programming languages. Historical perspective. Syntactic and semantic specifications, compilations, and interpretation processes. Comparative studies

of data types and data control, procedures and parameters, sequence control, nesting, scope and storage management, run-time representations. Problem solving using non-standard languages. No credit for students who have earned credit for 3270. FALL, SPRING. [3]

CS 5274. Modeling and Simulation. (Also listed as CS 3274) General theory of modeling and simulation of a variety of systems: physical processes, computer systems, biological systems, and manufacturing processes. Principles of discrete-event, continuous, and hybrid system modeling, simulation algorithms for the different modeling paradigms, methodologies for constructing models of a number of realistic systems, and analysis of system behavior. Computational issues in modeling and analysis of systems. Stochastic simulations. No credit for students who have earned credit for 3274. [3]

CS 5276. Compiler Construction. (Also listed as CS 3276) Review of programming language structures, translation, loading, execution, and storage allocation. Compilation of simple expressions and statements. Organization of a compiler including compile-time and run-time symbol tables, lexical scan, syntax scan, object code generation, error diagnostics, object code optimization techniques, and overall design. Use of a high-level language to write a complete compiler. No credit for students who have earned credit for 3276. [3]

CS 5278. Principles of Software Engineering. (Also listed as CS 4278) The nature of software. The object-oriented paradigm. Software life-cycle models. Requirements, specification, design, implementation, documentation, and testing of software. Object-oriented analysis and design. Software maintenance. No credit for students who have earned credit for 4278. FALL. [3]

CS 5279. Software Engineering Project. (Also listed as CS 4279) Students work in teams to specify, design, implement, document, and test a nontrivial software project. The use of CASE (Computer Assisted Software Engineering) tools is stressed. No credit for students who have earned credit for 4279. SPRING. [3]

CS 5281. Principles of Operating Systems I. (Also listed as CS 3281) Resource allocation and control functions of operating systems. Scheduling of processes and processors. Concurrent processes and primitives for their synchronization. Use of parallel processes in designing operating system subsystems. Methods of implementing parallel processes on conventional computers. Virtual memory, paging, protection of shared and non-shared information. Structures of data files in secondary storage. Security issues. Case studies. No credit for students who have earned credit for 3281. FALL, SPRING. [3]

CS 5282. Principles of Operating Systems II. (Also listed as CS 3282) Projects involving modification of a current operating system. Lectures on memory management policies, including virtual memory. Protection and sharing of information, including general models for implementation of various degrees of sharing. Resource allocation in general, including deadlock detection and prevention strategies. Operating system performance measurement, for both efficiency and logical correctness. Two hours lecture and one hour laboratory. No credit for students who have earned credit for 3282. [3]

CS 5283. Computer Networks. (Also listed as CS 4283) Computer communications. Network (Internet) architecture. Algorithms and protocol design at each layer of the network stack. Cross-layer interactions and performance analysis. Network simulation tools. Lab and programming assignments. No credit for students who have earned credit for 4283. [3]

CS 5284. Computer Systems Analysis. (Also listed as CS 4284) Techniques for evaluating computer system performance with emphasis upon application. Topics include measurement and instrumentation techniques, benchmarking, simulation techniques, elementary queuing models, data analysis, operation analysis, performance criteria, case studies. Project involving a real computer system. No credit for students who have earned credit for 4284. [3]

CS 5285. Network Security. (Also listed as CS 4285) Principles and practice of network security. Security threats and mechanisms. Cryptography, key management, and message authentication. System

security practices and recent research topics. No credit for students who have earned credit for 4285. [3]

CS 5287. Principles of Cloud Computing. (Also listed as CS 4287) Fundamental concepts of cloud computing, different service models, techniques for resource virtualization, programming models, management, mobile cloud computing, recent advances, and hands-on experimentation. No credit for students who have earned credit for 4287. [3]

CS 5288. Web-based System Architecture. (Also listed as CS 4288) Core concepts necessary to architect, build, test, and deploy complex web-based systems; analysis of key domain requirements in security, robustness, performance, and scalability. No credit for students who have earned credit for 4288. FALL. [3]

CS 5891. Special Topics. (Also listed as CS 3891) [Variable credit: 1-3 each semester] No credit for students who have earned credit for 3891.

CS 5892. Special Topics. (Also listed as CS 3892) [Variable credit: 1-3 each semester] No credit for students who have earned credit for 3892.

CS 6310. Design and Analysis of Algorithms. [Formerly CS 310] Set manipulation techniques, divide-and-conquer methods, the greedy method, dynamic programming, algorithms on graphs, backtracking, branch-and-bound, lower bound theory, NP-hard and NP-complete problems, approximation algorithms. Prerequisite: CS 3250. SPRING. [3]

CS 6311. Graph Algorithms. [Formerly CS 311] Algorithms for dealing with special classes of graphs. Particular emphasis is given to subclasses of perfect graphs and graphs that can be stored in a small amount of space. Interval, chordal, permutation, comparability, and circular-arc graphs; graph decomposition. Prerequisite: CS 6310 or Math 4710. [3]

CS 6315. Automated Verification. [Formerly CS 315] Systems verification and validation, industrial case studies, propositional and predicate logic, syntax and semantics of computational tree and linear time logics, binary decision diagrams, timed automata model and real-time verification, hands on experience with model checking using the SMV, SPIN and UPPAAL tools, and state reduction techniques. [3]

CS 6320. Algorithms for Parallel Computing. [Formerly CS 320] Design and analysis of parallel algorithms for sorting, searching, matrix processing, FFT, optimization, and other problems. Existing and proposed parallel architectures, including SIMD machines, MIMD machines, and VLSI systolic arrays. Prerequisite: CS 6310. [3]

CS 6350. Artificial Neural Networks. [Formerly CS 350] Theory and practice of parallel distributed processing methods using networks of neuron-like computational devices. Neurobiological inspirations, attractor networks, correlational and error-correction learning, regularization, unsupervised learning, reinforcement learning, Bayesian and information theoretic approaches, hardware support, and engineering applications. SPRING. [3]

CS 6351. Advanced Animation. [Formerly CS 351] Current research issues and problems in computer animation, with special focus on motion capture, dynamic simulation, and key-framing. Cloth, deformable bodies, natural phenomena, geometric algorithms, procedural techniques, facial animation, hair, autonomous characters, flocking, empirical evaluation, and interfaces for animation. Prerequisite: CS 3259. FALL. [3]

CS 6352. Human-Computer Interaction. [Formerly CS 352] An overview of human computer interaction and problems of current interest. Topics include: Human factors, GOMS, user interface design and evaluation, interaction modalities, distributed cognition, ubiquitous computing. A project involving design and evaluation will be performed. [3]

CS 6358. Computer Vision. [Formerly CS 358] The fundamentals of computer vision and techniques for image understanding and high-level image processing. Includes image segmentation, geometric structures, relational structures, motion, matching, inference, and vision systems. Prerequisite: EECE 6357. SPRING. [3]

CS 6359. Medical Image Registration. [Formerly CS 359] Foundations of medical image registration. Mathematical methods and practical applications. Image-to-image registration, image-to-physical

registration, applications to image-guided procedures and the most commonly used imaging modalities with an emphasis on tomographic images. FALL. [3]

CS 6360. Advanced Artificial Intelligence. [Formerly CS 360] Discussion of state-of-the-art and current research issues in heuristic search, knowledge representation, deduction, and reasoning. Related application areas include: planning systems, qualitative reasoning, cognitive models of human memory, user modeling in ICAI, reasoning with uncertainty, knowledge-based system design, and language comprehension. Prerequisite: CS 4260 or equivalent. [3]

CS 6362. Advanced Machine Learning. Theory and algorithms for designing systems that learn from data including modern machine learning methods that take advantage of increased complexity to provide improved performance. Data types, data pre-processing, measures of similarity and dissimilarity. Supervised learning: decision trees, logistic regression, support vector machines, Bayesian methods, and neural networks; unsupervised learning: partitional, hierarchical, density-based, and graph clustering algorithms. Feature selection for classification and clustering. Evaluation methods. Reinforcement learning: Markov Decision processes, dynamic programming, Monte Carlo methods, TD-learning. Prerequisite: CS 4262 or 5262 or 6360. FALL. [3]

CS 6364. Intelligent Learning Environments. [Formerly CS 364] Theories and concepts from computer science, artificial intelligence, cognitive science, and education that facilitate designing, building, and evaluating computer-based instructional systems. Development and substantiation of the concept, architecture, and implementation of intelligent learning environments. Multimedia and web-based technology in teaching, learning, collaboration, and assessment. Prerequisite: CS 4260, CS 6360, or equivalent. [3]

CS 6366. Distributed Artificial Intelligence. [Formerly CS 366] Principles and practice of multiple agent systems for distributed artificial intelligence. Game theory, distributed negotiation and decision making, distributed problem solving, cooperation, coalition formation and distributed learning. Prerequisite: CS 4260. [3]

CS 6368. Computational Economics. Models and methods in computational economics, such as linear and non-linear optimization, decision theory, game theory, mechanism design, and computational tools. Applications in areas such as auctions, economics of security and privacy, market design, and algorithmic trading. Prerequisite: CS 4260 or 5260. SPRING. [3]

CS 6375. Discrete-Event Systems: Supervisory Control and Diagnosis. [Formerly CS 375] Algebraic structures, automata and formal language theory, process modeling with finite-state automata, supervisory control theory, controllability and supervision, supervisory control under partial observation, modular and hierarchical supervisory control, supervisory control of real-time systems, fault diagnosis of discrete-event systems, and modular diagnosis approaches. SPRING. [3]

CS 6376. Foundations of Hybrid and Embedded Systems. [Formerly CS 376] Modeling, analysis, and design of hybrid and embedded systems. Heterogeneous modeling and design of embedded systems using formal models of computation, modeling and simulation of hybrid systems, properties of hybrid systems, analysis methods based on abstractions, reachability, and verification of hybrid systems. FALL. [3]

CS 6377. Topics in Embedded Software and Systems. [Formerly CS 377] Specification and composition of domain-specific modeling languages. Design methodologies for embedded systems. Platforms for embedded system design and implementation. Analysis of embedded systems. SPRING. [3]

CS 6381. Distributed Systems Principles. [Formerly CS 381] Techniques and mechanisms in distributed system design, such as logical clocks, distributed consensus, distributed mutual exclusion, consistency models, fault tolerance and paradigms of communication. Contemporary distributed system case studies and open challenges. Prerequisite: CS 3281. [3]

CS 6384. Performance Evaluation of Computer Systems. [Formerly CS 384] Techniques for computer systems modeling and analysis.

Analytical modeling with emphasis on queuing network models, efficient computational algorithms for exact and approximate solutions, parameter estimation and prediction, validation techniques, workload characterization, performance optimization, communication and distributed system modeling. Prerequisite: CS 3281 or 6381. SPRING. [3]

CS 6385. Advanced Software Engineering. [Formerly CS 385] An intensive study of selected areas of software engineering. Topics may include CASE tools, formal methods, generative techniques, aspect-oriented programming, metrics, modeling, reuse, software architecture, testing, and open-source software. Prerequisite: CS 4278. FALL. [3]

CS 6386. System-Level Fault Diagnosis. [Formerly CS 386] An overview of the basic concepts of the theory of fault diagnosis and problems of current interest. Topics include the classical PMC and BGM models of fault diagnosis, hybrid (permanent and intermittent faults) models, diagnostic measures for one-step, sequential, and inexact diagnosis. Emphasis is on algorithmic techniques for solving the diagnosis and diagnosability problems in various models. Prerequisite: CS 6381. SPRING. [3]

CS 6387. Topics in Software Engineering. [Formerly CS 387] Topics may include empirical software engineering and open-source software engineering. Prerequisite: CS 4278 or consent of instructor. SPRING. [3]

CS 6388. Model-Integrated Computing. [Formerly CS 388] Problems of designing, creating, and evolving information systems by providing rich, domain-specific modeling environments including model analysis and model-based program synthesis tools. Class presentation and project are required. FALL. [3]

CS 7999. Master's Thesis Research. [Formerly CS 369] [0-6]

CS 8390. Individual Studies. [Formerly CS 390] [1-3]

CS 8395. Special Topics. [Formerly CS 395] [3]

CS 8396. Special Topics. [Formerly CS 396] [3]

CS 8991. Seminar. [Formerly CS 391] [1-3 each semester]

CS 8992. Seminar. [Formerly CS 392] [1-3 each semester]

CS 8999. Non-Candidate Research. [Formerly CS 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [0-12]

CS 9999. Ph.D. Dissertation Research. [Formerly CS 399]

Electrical Engineering

EECE 2112. Circuits I. [Formerly EECE 112] Development of basic electrical circuit element models, signal representations, and methods of circuit analysis. Matrix methods and computer techniques. Demonstrations of physical components, measurement techniques, and transient phenomena. Corequisite: Physics 1602; Math 2300. FALL, SPRING. [3]

EECE 2116. Digital Logic. [Formerly EECE 116] Numbering systems. Boolean algebra and combinational logic, graphical simplification, sequential logic, registers, and state machines. EECE 2116 is not open to students who have earned credit for EECE 2123. Corequisite: EECE 2116L. FALL, SPRING. [3]

EECE 2116L. Digital Logic Laboratory. [Formerly EECE 116L] Laboratory for EECE 2116. One three-hour laboratory per week. EECE 2116L is not open to student who have earned credit for EECE 2123L. Corequisite: EECE 2116. FALL, SPRING. [1]

EECE 2123. Digital Systems. Digital systems and computer architectures and digital systems, from transistor circuits and logic gates, to simple machine (e.g. von Neumann) models. Boolean algebra, Information representation, state machines, processors, process handling, I/O handling, and assembler concepts. EECE 2123 is not open to students who have earned credit for EECE 2116. Prerequisite: CS 1101 or CS 1104. Corequisite: EECE 2123L. FALL, SPRING [3]

EECE 2123L. Digital Systems Laboratory. Laboratory for EECE 2123. One three-hour laboratory per week. Credit given for only one of EECE 2123L and ECE 2116L. Corequisite: EECE 2123. FALL, SPRING [1]

EECE 2213. Circuits II. [Formerly EECE 213] Steady-state and transient analysis of electrical networks with emphasis on Laplace transform methods and pole-zero concepts. Prerequisite: EECE 2112, Physics 1602. Corequisite: EECE 2213L, Math 2400. FALL, SPRING. [3]

EECE 2213L. Circuits II Laboratory. [Formerly EECE 213L] Laboratory for EECE 2213. One three-hour laboratory per week. Corequisite: EECE 2213. FALL, SPRING. [1]

EECE 2218. Microcontrollers. [Formerly EECE 218] Microprocessor and microcontroller architecture with emphasis on control applications. Usage of assembly language and interfacing with programs written in high-level languages. Interfacing and real-time I/O with 8-bit microprocessors, control algorithms, and networking with microcontrollers. Prerequisite: EECE 2116 or EECE 2123, and one of CS 1101 or CS 1103. Corequisite: EECE 2218L. SPRING. [3]

EECE 2218L. Microcontrollers Laboratory. [Formerly EECE 218L] Laboratory for EECE 2218. A small structured project is required. One three-hour laboratory per week. Corequisite: EECE 2218. SPRING. [1]

EECE 3214. Signals and Systems. [Formerly EECE 214] Fundamental signals, systems, and linear algebra concepts necessary for the study of communications and control systems. Includes continuous-time and discrete-time signal and system concepts, Fourier analysis in both continuous and discrete-time, Z-transform, and the FFT. Prerequisite: EECE 2112. FALL, SPRING. [3]

EECE 3233. Electromagnetics. [Formerly EECE 233] Electromagnetic field theory. Maxwell's equations from a historical approach. Electromagnetic waves with regard to various media and boundary conditions. Prerequisite: PHYS 1602. Corequisite: Math 2400. FALL. [3]

EECE 3235. Electronics I. [Formerly EECE 235] Semiconductor devices and electronic circuits. Diodes, BJT and MOS transistors. Device models, modes of operation, biasing. Small-signal models, low-frequency analysis of single- and multi-stage analog amplifiers, simple amplifier design. Large signal models, dc analysis of digital circuits. Prerequisite: EECE 2112. Corequisite: EECE 3235L. FALL. [3]

EECE 3235L. Electronics I Laboratory. [Formerly EECE 235L] Laboratory for EECE 3235. One three-hour laboratory per week. Corequisite: EECE 3235. FALL. [1]

EECE 3860. Undergraduate Research. [Formerly EECE 203] Supervised projects in electrical engineering, computer engineering, or related fields. Consent of instructor required. No more than 6 hours of EECE 3860 and 3861 may be applied toward graduation. [1-3]

EECE 3861. Undergraduate Research. [Formerly EECE 204] Supervised projects in electrical engineering, computer engineering, or related fields. Consent of instructor required. No more than 6 hours of EECE 3860 and 3861 may be applied toward graduation. [1-3]

EECE 3891. Special Topics. [Formerly EECE 291] [1-3 each semester]

EECE 3892. Special Topics. [Formerly EECE 292] [1-3 each semester]

EECE 4252. Signal Processing and Communications. [Formerly EECE 252] AM and FM modulation. Advanced topics in signal processing. Prerequisite: EECE 3214. SPRING. [3]

EECE 4257. Control Systems I. [Formerly EECE 257] Theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Model representation. State-variable models. Prerequisite: EECE 2213 or EECE 3214. FALL. [3]

EECE 4267. Power System Analysis. [Formerly EECE 267] Analysis of large transmission and distribution networks. Analysis of power lines, load flow, short circuit studies, economic operation, and stability. Prerequisite: EECE 2213. [3]

EECE 4268. Distributed Electrical Energy Systems. Uses of photovoltaics and wind as well as micro-hydro, fuel cells, and geothermal for producing electricity. Comparison with traditional generating methods

based on the prime movers (steam, gas, etc.) and types (primarily three-phase) of electrical generators used. The economics of stand-alone and grid connected systems are covered. Prerequisite: EECE 2112. [3]

EECE 4275. Microelectronic Systems. [Formerly EECE 275] Active devices in the context of digital systems, with an emphasis on embedded systems integration. Characteristics and utilization of different digital integrated circuit families, common bus structures and protocols and real-world interfaces (comparators, A/D/A conversion). Prerequisite: EECE 2112; EECE 2116 or EECE 2123. SPRING. [3]

EECE 4283. Principles and Models of Semiconductor Devices. [Formerly EECE 283] Physical principles of operation of the p-n junction, MOS field-effect transistor, and bipolar transistor. Fundamentals of charge transport, charge storage, and generation-recombination; application to the operation of MOSFET and BJT. Device modeling with emphasis on features and constraints of integrated circuit technologies. Prerequisite: EECE 3235. [3]

EECE 4284. Integrated Circuit Technology and Fabrication. [Formerly EECE 284] Monolithic integrated circuit technology. Basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. Prerequisite: EECE 3235. SPRING. [3]

EECE 4286. Audio Engineering. [Formerly EECE 286] Engineering aspects of high fidelity sound reproduction, with emphasis on digital audio and loudspeakers. Analog-to-digital and digital-to-analog conversion, data storage, perceptual coding, loudspeaker design. Prerequisite: EECE 2213, EECE 3235. [3]

EECE 4287. Engineering Reliability. [Formerly EECE 287] Topics in engineering reliability with emphasis on electrical devices and systems. Reliability concepts and models. Risk analysis. Lifetime evaluation. System examples. Prerequisite: EECE 3235 or EECE 4275. [3]

EECE 4288. Optoelectronics. [Formerly EECE 288] Fundamentals and applications of light generation, propagation, and modulation in passive and active optoelectronic components. Waveguides, lasers, electro-optic modulators, and emerging optoelectronic technology for optical communication, computing, and sensing applications. Prerequisite: EECE 3233 or equivalent. SPRING. [3]

EECE 4334. RF and Microwave Design. Modeling of components and transmission structures at RF and microwave frequencies (30 MHz to 30 GHz), with emphasis on the effects of materials and geometry on passive structures for filtering and impedance matching. Modeling and design of active circuits and components such as RF amplifiers with input and output impedance matching structures. Prerequisite: EECE 3233. SPRING. [3]

EECE 4353. Image Processing. [Formerly EECE 253] Theory of signals and systems is extended to two dimensions. Filtering, 2-D FFTs, edge detection, and image enhancement. Three lectures and one laboratory period. FALL. [4]

EECE 4354. Computer Vision. [Formerly EECE 254] Vision as a computational problem. Theories of vision, inverse optics, image representation, and solutions to ill-posed problems. Prerequisite: EECE 4353. [3]

EECE 4356. Digital Signal Processing. [Formerly EECE 256] Applications of Digital Signal Processing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laboratory period. Prerequisite: EECE 3214. SPRING. [4]

EECE 4358. Control Systems II. [Formerly EECE 258] Modern control design. Discrete-time analysis. Analysis and design of digital control systems. Nonlinear systems and optimum control systems. Fuzzy control systems. Two lectures and one laboratory. Prerequisite: EECE 4257. SPRING. [3]

EECE 4371. Mobile and Wireless Networks. [Formerly EECE 261] Design, development, and applications of mobile applications and services. Topics include wireless technologies, smart phone programming, cloud computing services. Credit given for only one of EECE 4371 or CS 4283. Prerequisite: CS 2201 or equivalent programming experience. [3]

EECE 4376. Embedded Systems. [Formerly EECE 276] Design and implementation of embedded computer-based systems. Programming for real-time systems and the Internet of Things. Embedded system modeling, design, analysis, and implementation using real-time and event-driven techniques. A structured project is required. Prerequisite: EECE 2218, CS 2201. Corequisite: EECE 4376L. FALL. [3]

EECE 4376L. Embedded Systems Laboratory. [Formerly EECE 276L] Laboratory for EECE 4376. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: EECE 4376. FALL. [1]

EECE 4377. FPGA Design. [Formerly EECE 277] Design and applications of field-programmable gate arrays, Electronic Design Automation (EDA) tools for design, placement, and routing. Hardware description languages. Implementation of designs on prototype FPGA board. Prerequisite: EECE 2116 or EECE 2123. [3]

EECE 4380. Electronics II. [Formerly EECE 280] Integrated circuit analysis and design. High frequency operation of semiconductor devices. Frequency-response and feedback analysis of BJT and MOS analog amplifier circuits, multi-stage frequency-compensated amplifier design. Transient analysis of BJT and MOS digital circuit families. Digital-to-analog and analog-to-digital conversion circuits. Prerequisite: EECE 3235. SPRING. [3]

EECE 4385. VLSI Design. [Formerly EECE 285] Integrated circuit and fabrication techniques; CAD tools for design, layout, and verification; parasitic elements and their effects on circuit performance; system-level design experience is gained by completing design and layout phases of a project. Prerequisite: EECE 2116 or EECE 2123; EECE 3235. FALL. [3]

EECE 4950. Program and Project Management for EECE. [Formerly EECE 295] Methods for planning programs and projects. Organization structures and information management for project teams. Communications between project teams and clients, government agencies, and others. Motivational factors and conflict resolution. Budget/schedule control. Similar to ENGM 3700, but preparatory to the EECE senior design project course, EECE 4951. Credit given for only one of ENGM 3700, CE 4400 or EECE 4950. Prerequisite: Senior standing. Corequisite: EECE 4959. FALL. [3]

EECE 4951. Electrical and Computer Engineering Design. [Formerly EECE 296] Based on product specifications typically supplied by industrial sponsors, teams of students responsible for the formulation, execution, qualification, and documentation of a culminating engineering design. The application of knowledge acquired from earlier coursework, both within and outside the major area, along with realistic technical, managerial, and budgetary constraints using standard systems engineering methodologies and practices. Prerequisite: EECE 4950, at least one DE course, senior standing. SPRING. [3]

EECE 4959. Senior Engineering Design Seminar. [Formerly EECE 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: EECE 4950. FALL. [1]

EECE 5218. Microcontrollers. (Also listed as EECE 2218) Microprocessor and microcontroller architecture with emphasis on control applications. Usage of assembly language and interfacing with programs written in high-level languages. Interfacing and realtime I/O with 8-bit microprocessors, control algorithms, and networking with microcontrollers. Graduate credit only for non-majors. No credit for students who have earned credit for 2218. Corequisite: EECE 5218L. SPRING. [3]

EECE 5218L. Microcontrollers Laboratory. (Also listed as EECE 2218L) Laboratory for EECE 5218. A small structured project is required. One three-hour laboratory per week. Graduate credit only for non-majors. No credit for students who have earned credit for 2218L. Corequisite: EECE 5218. SPRING. [1]

EECE 5233. Electromagnetics. (Also listed as EECE 3233) Electromagnetic field theory. Maxwell's equations developed from a historical approach. Electromagnetic waves with regard to various media and boundary conditions. Graduate credit only for non-majors. No credit for students who have earned credit for 3233. FALL. [3]

EECE 5235. Electronics I. (Also listed as EECE 3235) Semiconductor devices and electronic circuits. Diodes, BJT and MOS transistors. Device models, modes of operation, biasing. Small-signal models, low-frequency analysis of single- and multi-stage analog amplifiers, simple amplifier design. Large signal models, dc analysis of digital circuits. Graduate credit only for non-majors. Corequisite: EECE 5235L. No credit for students who have earned credit for 3235. FALL. [3]

EECE 5235L. Electronics I Laboratory. (Also listed as EECE 3235L) Laboratory for EECE 3235. One three-hour laboratory per week. Corequisite: EECE 5235. No credit for students who have earned credit for 3235L. FALL. [1]

EECE 5252. Signal Processing and Communications. (Also listed as EECE 4252) AM and FM modulation. Also, advanced topics in signal processing are treated. No credit for students who have earned credit for 4252. SPRING. [3]

EECE 5257. Control Systems I. (Also listed as EECE 4257) Theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Model representation. State-variable models. No credit for students who have earned credit for 4257. FALL. [3]

EECE 5267. Power System Analysis. (Also listed as EECE 4267) Analysis of large transmission and distribution networks. Analysis of power lines, load flow, short circuit studies, economic operation, and stability are introduced. No credit for students who have earned credit for 4267. [3]

EECE 5268. Distributed Electrical Energy Systems. Uses of photovoltaics and wind as well as micro-hydro, fuel cells, and geothermal for producing electricity. Comparison with traditional generating methods based on the prime movers (steam, gas, etc.) and types (primarily three-phase) of electrical generators used. The economics of stand-alone and grid connected systems are covered. Prerequisite: EECE 2112. [3]

EECE 5275. Microelectronic Systems. (Also listed as EECE 4275) Active devices in the context of digital systems, with an emphasis on embedded systems integration. Characteristics and utilization of different digital integrated circuit families, common bus structures and protocols and realworld interfaces (comparators, A/D/A conversion). No credit for students who have earned credit for 4275. SPRING. [3]

EECE 5283. Principles and Models of Semiconductor Devices. (Also listed as EECE 4283) Physical principles of operation of the p-n junction, MOS field-effect transistor, and bipolar transistor. Fundamentals of charge transport, charge storage, and generation-recombination; application to the operation of MOSFET and BJT. Device modeling with emphasis on features and constraints of integrated circuit technologies. No credit for students who have earned credit for 4283. [3]

EECE 5284. Integrated Circuit Technology and Fabrication. (Also listed as EECE 4284) Monolithic integrated circuit technology. Basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. No credit for students who have earned credit for 4284. SPRING. [3]

EECE 5286. Audio Engineering. (Also listed as EECE 4286) Engineering aspects of high fidelity sound reproduction, with emphasis on digital audio and loudspeakers. Analog-to-digital and digital-to-analog conversion, data storage, perceptual coding, loudspeaker design. No credit for students who have earned credit for 4286. [3]

EECE 5287. Engineering Reliability. (Also listed as EECE 4287) Topics in engineering reliability with emphasis on electrical devices and systems. Reliability concepts and models. Risk analysis. Lifetime evaluation. System examples. No credit for students who have earned credit for 4287. [3]

EECE 5288. Optoelectronics. (Also listed as EECE 4288) Fundamentals and applications of light generation, propagation, and modulation in passive and active optoelectronic components. Waveguides, lasers, electro-optic modulators, and emerging optoelectronic technology for optical communication, computing, and sensing applications. No credit for students who have earned credit for 4288. SPRING. [3]

EECE 5334. RF and Microwave Design. Modeling of components and transmission structures at RF and microwave frequencies (30 MHz to 30 GHz), with emphasis on the effects of materials and geometry on passive structures for filtering and impedance matching. Modeling and design of active circuits and components such as RF amplifiers with input and output impedance matching structures. Prerequisite: EECE 3233. SPRING. [3]

EECE 5353. Image Processing. Digital imaging and computational photography. Image formation. Point processing. Color perception and manipulation. Spatial filtering via convolution. 2D Fourier transforms. Frequency-domain filtering. Intensity quantization. High dynamic range imaging. Resampling for image resizing, rotation, and warping. Image compositing. Panorama generation. Noise reduction. Mathematical morphology. Image compression. Three lectures and one three-hour virtual laboratory. No credit for students who have earned credit for 4353. FALL. [4]

EECE 5354. Computer Vision. Computational processes. Python and OpenCV for real-time processing. Feature detection: edges, corners, and oriented histogram methods. Feature matching. Scale space. Projective geometry. Camera models. Stereopsis. Image rectification. Multi-baseline stereo. Motion estimation. 3D reconstruction. Machine learning for computer vision including multilayer neural networks. No credit for students who have earned credit for 4354. SPRING. [3]

EECE 5356. Digital Signal Processing. (Also listed as EECE 4356) Applications of Digital Signal Processing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laboratory period. No credit for students who have earned credit for 4356. SPRING. [4]

EECE 5358. Control Systems II. (Also listed as EECE 4358) Modern control design. Discrete-time analysis. Analysis and design of digital control systems. Nonlinear systems and optimum control systems. Fuzzy control systems. Two lectures and one laboratory. No credit for students who have earned credit for 4358. SPRING. [3]

EECE 5371. Mobile and Wireless Networks. (Also listed as EECE 4371) Design, development, and applications of mobile applications and services. Topics include wireless technologies, smart phone programming, cloud computing services. No credit for students who have earned credit for 4271. [3]

EECE 5376. Embedded Systems. (Also listed as EECE 4376) Design and application of embedded microcontroller-based systems. Programming for real-time systems and the Internet of Things. Embedded system modeling, design, analysis, and implementation using real-time and event-driven techniques. A structured project is required. No credit for students who have earned credit for 4376. Corequisite: EECE 5376L. FALL. [3]

EECE 5376L. Embedded Systems Laboratory. (Also listed as EECE 4376L) Laboratory for EECE 5376. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: EECE 5376. No credit for students who have earned credit for 4376L. FALL. [1]

EECE 5377. FPGA Design. (Also listed as EECE 4377) Design and applications of field-programmable gate arrays, Electronic Design Automation (EDA) tools for design, placement, and routing. Hardware description languages. Implementation of designs on prototype FPGA board. No credit for students who have earned credit for 4377. [3]

EECE 5380. Electronics II. (Also listed as EECE 4380) Integrated circuit analysis and design. High frequency operation of semiconductor devices. Frequency-response and feedback analysis of BJT and MOS analog amplifier circuits, multi-stage frequency-compensated amplifier design. Transient analysis of BJT and MOS digital circuit families. Digital-to-analog and analog-to-digital conversion circuits. No credit for students who have earned credit for 3380. SPRING. [3]

EECE 5385. VLSI Design. (Also listed as EECE 4385) Integrated circuit and fabrication techniques; CAD tools for design, layout, and verification; parasitic elements and their effects on circuit performance; system-level design experience is gained by completing design and layout phases of a project. No credit for students who have earned credit for 4385. FALL. [3]

EECE 5891. Special Topics. (Also listed as EECE 3891) No credit for students who have earned credit for 3891. [1-3 each semester]

EECE 5892. Special Topics. (Also listed as EECE 3892) No credit for students who have earned credit for 3892. [1-3 each semester]

EECE 6301. Solid-State Materials. [Formerly EECE 301] Properties of charged particles under the influence of an electric field, quantum mechanics, particle statistics, fundamental particle transport, and band theory of solids. FALL. [3]

EECE 6302. Electric and Magnetic Properties of Solids. [Formerly EECE 302] Electromagnetic theory of solids using advanced mathematical and computational techniques. Dielectric, magnetic, and optical properties. Fundamental interactions of electromagnetic radiation and charged particles in solids. Prerequisite: EECE 6301. SPRING. [3]

EECE 6304. Radiation Effects and Reliability of Microelectronics. [Formerly EECE 304] The space radiation environment and effects on electronics, including basic mechanisms of radiation effects and testing issues. Total dose, single-event, high-dose-rate, and displacement damage radiation effects. Effects of defects and impurities on MOS long-term reliability. SPRING. [3]

EECE 6305. Topics in Applied Magnetics. [Formerly EECE 305] Selected topics in magnetism, magnetic properties of crystalline and non-crystalline materials; ferrite materials for electronics and microwave applications, resonance phenomena. Prerequisite: EECE 6302. [3]

EECE 6306. Solid-State Effects and Devices I. [Formerly EECE 306] The semiconductor equations are examined and utilized to explain basic principles of operation of various state-of-the-art semiconductor devices including bipolar and MOSFET devices. FALL. [3]

EECE 6307. Solid-State Effects and Devices II. [Formerly EECE 307] The structure of solids, phonons, band theory, scattering phenomena, and theory of insulators. [3]

EECE 6311. Systems Theory. [Formerly EECE 311] Use of linear algebra and matrix analysis for solving systems of linear and ordinary differential equations. State space representations of control systems. Stability, controllability, and observability. Support-vector machines as applied functional analysis. Gradient-based optimization techniques. Dimensionality reduction. SPRING. [3]

EECE 6321. Cyber-Physical Systems. Modeling, design, and analysis of cyber-physical systems that integrate computation and communication with physical systems. Modeling paradigms and models of computation, design techniques and implementation choices, model-based analysis and verification. Project that covers the modeling, design, and analysis of CPS. [3]

EECE 6341. Advanced Analog Electronics. [Formerly EECE 341] Analysis and design of analog electronics circuits with emphasis on integrated circuits. Topics include operational amplifiers, wideband amplifiers, multipliers, and phase-locked loops. FALL. [3]

EECE 6342. Advanced Digital Electronics. [Formerly EECE 342] Analysis and design of digital electronic circuits with emphasis on integrated circuits. Topics include logic families, semiconductor memories, and the analog-digital interface. [3]

EECE 6343. Digital Systems Architecture. [Formerly EECE 343] Architectural descriptions of various CPU designs, storage systems, IO systems, parallel and von Neumann processors and interconnection networks. [3]

EECE 6354. Advanced Real-Time Systems. [Formerly EECE 354] Fundamental problems in real-time systems, with focus on modeling, analysis, and design. Topics include: scheduling theory and techniques, time synchronization, time- and event-triggered systems, distributed

architectures, advanced programming languages for real-time systems. Literature reviews and projects. [3]

EECE 6356. Intelligent Systems and Robotics. Fundamental technologies in autonomous vehicles. Bayesian probability. Probabilistic robotics. Coordinate changes. Representations of rotation. Motion and sensor models. Bayes filters. Simultaneous localization and mapping. Current machine learning approaches. FALL. [3]

EECE 6357. Advanced Image Processing. [Formerly EECE 357] Techniques of image processing. Topics include image formation, digitization, linear shift-invariant processing, feature detection, and motion. Prerequisite: MATH 2300; programming experience. FALL. [3]

EECE 6358. Quantitative Medical Image Analysis. Image processing and statistical methods for quantitative analysis and interpretation of medical imaging data. Neuroimaging approaches related to brain structure, function, and connectivity. Massively univariate analysis (parametric mapping), multiple comparison issues, random fields, independent components, non-parametric approaches, and Monte Carlo methods. Students should have knowledge of undergraduate probability and computer programming. [3]

EECE 6361. Random Processes. [Formerly EECE 361] Concepts of random variables, functions of random variables, and random processes. Spectral properties of random processes and of the response of linear systems to random inputs. Linear mean square estimation. Emphasis on engineering applications. FALL. [3]

EECE 6362. Detection and Estimation Theory. [Formerly EECE 362] Fundamental aspects of signal detection and estimation. Formulation of maximum likelihood, maximum a posteriori, and other criteria. Multi-dimensional probability theory, signal and noise problems, and Kalman filter structure are studied. SPRING. [3]

EECE 7899. Master of Engineering Project. [Formerly EECE 389]

EECE 7999. Master's Thesis Research. [Formerly EECE 369] [0-6]

EECE 8395. Special Topics. [Formerly EECE 395] Based on research and current developments in electrical engineering of special interest to staff and students. [3]

EECE 8396. Special Topics. [Formerly EECE 396] Based on research and current developments in electrical engineering of special interest to staff and students. [3]

EECE 8850. Independent Study. [Formerly EECE 397] Readings and/or projects on advanced topics in electrical engineering under the supervision of the staff. Consent of instructor required. [Variable credit: 1-3 each semester]

EECE 8991. Seminar. [Formerly EECE 392] [1]

EECE 8992. Advanced Seminar for Ph.D. Candidates. [Formerly EECE 393] [1]

EECE 8999. Non-Candidate Research. [Formerly EECE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit 0-12]

EECE 9999. Ph.D. Dissertation Research. [Formerly EECE 399]

Engineering Management

ENGM 2160. Engineering Economy. [Formerly ENGM 216] Economic evaluation and comparison of alternatives: interest, periodic payments, depreciation, criteria, and analytical procedures in investment decision-making, and cost-estimating. FALL, SPRING. [3]

ENGM 2210. Technology Strategy. [Formerly ENGM 221] Critical issues faced by chief technology officers. Assessment of technological capabilities and opportunities, formulation of a technical plan for the product portfolio and commercialization, management of intellectual property, and economic analysis. Prerequisite: Sophomore standing. FALL, SPRING. [3]

ENGM 2440. Applied Behavioral Science. [Formerly ENGM 244] Leadership styles, power team building, conflict resolution, management resolution, interviewing techniques. Prerequisite: Sophomore standing. FALL, SPRING, SUMMER. [3]

ENGM 3000. Enterprise System Design. [Formerly ENGM 272] Design of complex enterprise systems and processes including enterprise requirements analysis, process-mapping, modeling, performance measurement, benchmarking, solution development, and change management. Prerequisite: ENGM 2210 or BUS 2700, junior standing. FALL, SPRING. [3]

ENGM 3010. Systems Engineering. [Formerly ENGM 273] Fundamental considerations associated with the engineering of large-scale systems. Models and methods for systems engineering and problem solving using a systems engineering approach. Prerequisite: ENGM 2210, junior standing. FALL, SPRING. [3]

ENGM 3100. Finance and Accounting for Engineers. [Formerly ENGM 251] Time value of money, capital budgeting and formation, financial accounting and reporting, double entry bookkeeping, taxation, performance ratio measurements, and working capital management. Probabilistic models for expected net present value and rate of return, dividend pricing models for alternative growth scenarios, cost and market based models for average cost of capital, taxation algorithms, and regression analysis for individual firm betas. Prerequisite: Junior standing. FALL, SPRING, SUMMER. [3]

ENGM 3200. Technology Marketing. [Formerly ENGM 242] Strategies for marketing technology-based products and services. Demand analysis, segmentation, distribution, and personal selling. Economic analysis from inception to end use. Prerequisite: ENGM 2210 or BUS 2600, junior standing. FALL. [3]

ENGM 3300. Technology Assessment and Forecasting. [Formerly ENGM 275] Methods of forecasting technological advancements and assessing their potential intended and unintended consequences. Delphi method, trend exploration, environmental monitoring, and scenario development. Prerequisite: Junior standing. SPRING. [3]

ENGM 3350. Organizational Behavior. [Formerly ENGM 264] Study of the factors that impact how individuals and groups interact and behave within organizations, and how organizations respond to their environment. Motivation theory, communication within organizations, group dynamics, conflict management, decision making, power, strategic planning, organizational culture, and change. Focus on utilizing analytical tools to understand organizations: symbolic, political, human resources, and structural. Prerequisite: ENGM 2440. [3]

ENGM 3600. Technology-Based Entrepreneurship. [Formerly ENGM 253] Identification and evaluation of opportunities: risks faced by entrepreneurs, market assessment, capital requirements, venture capital acquisition, legal structures, tax implications for sharing technology-based businesses. Prerequisite: Junior standing. FALL. [3]

ENGM 3650. Operations and Supply Chain Management. [Formerly ENGM 254] Manufacturing strategy, process analysis, product and process design, total quality management, capacity planning, inventory control, supply chain design, and advanced operations topics. Modeling and analysis using cases and spreadsheets. Prerequisite: MATH 1301 or BUS 2700, junior standing. FALL. [3]

ENGM 3700. Program and Project Management. [Formerly ENGM 274] Scheduling, cost estimation/predictions, network analysis, optimization, resource/load leveling, risk/mitigation, quality/testing, international projects. Term project required. Provides validated preparation for the Project Management Institute CAPM certification for undergraduates or the PMP for graduate students. Credit given for only one of ENGM 3700, CE 4400, or EECE 4950. Prerequisite: MATH 1301 or BUS 2700, junior standing. FALL, SPRING, SUMMER. [3]

ENGM 3850. Independent Study. [Formerly ENGM 289] Readings or projects on topics in engineering management under the supervision of the ENGM faculty. Consent of instructor required. [1-3 each semester, not to exceed a total of 3].

ENGM 3851. Independent Study. [Formerly ENGM 290] Readings or projects on topics in engineering management under the supervision of the ENGM faculty. Consent of instructor required. [1-3 each semester, not to exceed a total of 3]

ENGM 3890. Special Topics. [Formerly ENGM 291] Variable credit, 1-3 each semester. [1-3]

ENGM 3891. Special Topics. [Formerly ENGM 292] [Variable credit: 1-3 each semester]

ENGM 4500. Product Development. [Formerly ENGM 276] Project-based course focused on the methods for managing the design, development, and commercialization of new products. Generating product concepts, developing a prototype strategy, modeling financial returns, securing intellectual property, designing retail packaging, and performing market testing to establish an optimal price. Teams include Engineering and MBA students. Prerequisite: ENGM 2210; ENGM 3700 or CE 4400 or EECE 4950; junior standing. SPRING. [4]

ENGM 4800. Wealth Management for Engineers. Foundations of financial planning; managing basic assets, credit, and insurance needs; employee incentive plans such as stock options, deferred compensation and severance; managing investments in stocks, bonds, mutual funds, and real estate; retirement and estate planning such as 401k, 403b, IRA, Roth, estate preservation. SPRING [1]

ENGM 4951. Engineering Management Capstone Project. [Formerly ENGM 296] Application of engineering management concepts through team projects sponsored by faculty or seed-stage technology companies. Thinking, analysis, and planning processes needed to commercialize a concept and develop a business plan for presentation to investors. Prerequisite: ENGM 2210; ENGM 3000 or 3010. Corequisite: ENGM 3700. SPRING. [3]

ENGM 5000. Enterprise System Design. (Also listed as ENGM 3000) Design of complex enterprise systems and processes including enterprise requirements analysis, process-mapping, modeling, performance measurement, benchmarking, solution development, and change management. No credit for students who have earned credit for 3000. FALL, SPRING. [3]

ENGM 5010. Systems Engineering. (Also listed as ENGM 3010) Fundamental considerations associated with the engineering of large-scale systems. Models and methods for systems engineering and problem solving using a systems engineering approach. No credit for students who have earned credit for 3010. FALL, SPRING. [3]

ENGM 5100. Finance and Accounting for Engineers. (Also listed as ENGM 3100) Time value of money, capital budgeting and formation, financial accounting and reporting, double entry bookkeeping, taxation, performance ratio measurements, and working capital management. Probabilistic models for expected net present value and rate of return, dividend pricing models for alternative growth scenarios, cost and market based models for average cost of capital, taxation algorithms, and regression analysis for individual firm betas. No credit for students who have earned credit for 3100. FALL, SPRING, SUMMER. [3]

ENGM 5200. Technology Marketing. (Also listed as ENGM 3200) Strategies for marketing technology-based products and services. Demand analysis, segmentation, distribution, and personal selling. Economic analysis from inception to end use. No credit for students who have earned credit for 3200. FALL. [3]

ENGM 5300. Technology Assessment and Forecasting. (Also listed as ENGM 3300) Methods of forecasting technological advancements and assessing their potential intended and unintended consequences. Delphi method, trend exploration, environmental monitoring, and scenario development. No credit for students who have earned credit for 3300. SPRING. [3]

ENGM 5600. Technology-Based Entrepreneurship. (Also listed as ENGM 3600) Identification and evaluation of opportunities: risks faced by entrepreneurs, market assessment, capital requirements, venture capital acquisition, legal structures, tax implications for sharing

technology-based businesses. No credit for students who have earned credit for 3600. FALL. [3]

ENGM 5650. Operations and Supply Chain Management. (Also listed as ENGM 3650) Manufacturing strategy, process analysis, product and process design, total quality management, capacity planning, inventory control, supply chain design, and advanced operations topics. Modeling and analysis using cases and spreadsheets. No credit for students who have earned credit for 3650. FALL. [3]

ENGM 5700. Program and Project Management. (Also listed as ENGM 3700) Scheduling, cost estimation/predictions, network analysis, optimization, resource/load leveling, risk/mitigation, quality/testing, international projects. Term project required. Provides validated preparation for the Project Management Institute CAPM certification for undergraduates or the PMP for graduate students. Credit given for only one of ENGM 3700 or 5700, CE 4400 or 5400, or EECE 4950. FALL, SPRING, SUMMER. [3]

ENGM 5890. Special Topics. Variable credit each semester. [1-3]

ENGM 6100. Strategic Technology Management. Assessment of new opportunities in an enterprise-developing technology products. Selection of opportunities to pursue. The stage gate model as a tool for technology and opportunity assessment. Formulation of a plan for new product introduction. Product lifecycle management, intellectual property management, and economic analysis. [3]

ENGM 6200. Technology Forecasting. Forecasting technological advancements and assessing their potential intended and unintended consequences. Delphi method, trend extrapolation, environmental monitoring, and scenario development. [3]

ENGM 6400. Operations and Supply Chain Strategy. Manufacturing and service processes for transforming resources into technology-based products. Strategies and processes for moving information and materials through technology-based product supply chains, and supporting overall firm objectives, product development programs and capacity utilization requirements. Manufacturing for flow design and facility layout. Processes, blueprinting, and waiting line analysis for structuring the service encounter. Six sigma quality and statistical process control. Lean supply chains, logistics, distribution and global sourcing. Enterprise resource planning, inventory management and materials requirement planning. [3]

ENGM 6500. Engineering Leadership and Program Management. Application of core principles of leadership and program management for engineering professionals. Strategic planning, people management, staffing, compensation, business process improvement theory, business interruption, leadership styles, emotional intelligence, negotiation, ethical business practices. [3]

ENGM 6600. Program and Project Management Strategies. Management of small to medium sized projects (\$10K to \$10M), and introduction to the management of very large and complex projects. The engineering design process, design tools, software assisted decision making, and professional management skills. [3]

ENGM 6700. Intellectual Property for Engineering and Scientists. Assessment of intellectual property law for a technical (non-legal) audience. Forms of IP protection (trademark, copyright, patents), with a focus on patents. Use of intellectual property on business strategy and effects on business and technology development decisions. Open source and its impact. Discussion of practical legal considerations and broader policy questions. [3]

ENGM 6800. Finance and Accounting. Capital budgeting, time value of money, cost of capital, and financial statement presentations. Capital formation for technology based firms. Sample debt and equity financings, leases and hybrid forms of capital. Financial accounting and reporting, metrics, sources of information, and statement analysis. Taxation of business income, financial modeling, asset based line of credit, and working capital management. [3]

ENGM 7897. Master of Engineering Project. [2]

ENGM 7898. Master of Engineering Project. Prerequisite: ENGM 7897. [2]

ENGM 7899. Master of Engineering Project. Prerequisite: ENGM 7898. [2]

Engineering Science

ES 1001. Engineering Commons iSeminar. Topics vary. Open elective credit only. [1]

ES 1115. Freshman Engineering Seminar. [Formerly ES 101] First-year Engineering Seminar. [1]

ES 1401. Introduction to Engineering, Module 1. [Formerly ES 140A] First of three required discipline-specific modules for Introduction to Engineering credit providing an introduction to engineering analysis and design. Discipline-specific modules selected based on individual choice. Students choose three different disciplines for the three modules and all three must be completed in one semester for full course credit. Emphasis is on contemporary engineering problem solving in a discipline-specific context. FALL. [1]

ES 1402. Introduction to Engineering, Module 2. [Formerly ES 140B] Continuation of ES 1401. ES 1401-1403 must be completed in one semester for full course credit. FALL. [1]

ES 1403. Introduction to Engineering, Module 3. [Formerly ES 140C] Continuation of ES 1402. ES 1401-1403 must be completed in one semester for full course credit. FALL. [1]

ES 2100W. Technical Communications. [Formerly ES 210W] Instruction and practice in written and oral communication. Emphasis is on organization and presentation of information to a specific audience for a specific purpose. Course includes writing and editing reports of various lengths, preparing and using visual aids, and presenting oral reports. Prerequisite: Sophomore standing. FALL, SPRING. [3]

ES 2700. Engineering Career Development. A practical course designed to help students succeed in the job/internship search and career development. Interviewing, networking, online tools, elevator pitch, career fair strategies, career center resources, company research techniques, resumes, cover letters, negotiating, follow-up messages. FALL [1]

ES 2900. Engineering and Public Policy. Role of federal policy in supporting and promoting engineering and science for the benefit of the U.S. Ways engineering, science and public policy impact each other. Federal government involvement, policy making, federal budget, role of universities and national labs, national defense, homeland security, biomedical enterprise. SPRING [3]

ES 3230. Ships Engineering Systems. [Formerly ES 230] Ship characteristics and types, including design and control, propulsion, hydrodynamic forces, stability, compartmentation, and electrical and auxiliary systems. Theory and design of steam, gas turbine, and nuclear propulsion. FALL. [3]

ES 3231. Navigation. [Formerly ES 231] Naval piloting procedures. Charts, visual and electronic aids, and theory and operation of magnetic and gyro compasses; inland and international rules of the nautical road. The celestial coordinate system, including spherical trigonometry and application for navigation at sea. Environmental influences on naval operations. SPRING. [3]

ES 3232. Ships Weapons Systems. [Formerly ES 232] Theory and employment of weapons systems, including the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. Fire control systems and major weapons types, including capabilities and limitations. Physical aspects of radar and underwater sound. Command, control, and communications and means of weapons system integration. SPRING. [3]

ES 3233. Naval Operations. [Formerly ES 233] Methods of tracking and intercepting at sea. Maritime maneuvering problems, formation tactics, and shipboard operations. Naval communications, ship behavior

and maneuvering, and applied aspects of ship handling. Prerequisite: ES 231. FALL. [3]

ES 3300. Energy and Sustainability—An Engineering Approach. Uses basic understanding of mechanics, thermodynamics, and electrodynamics to describe primary and secondary energy generation and use. Emphasis on current applications, energy efficiency at both the source and demand sides, and future (near and long-term) energy scenarios. Various economic models are explored. Prerequisite: Junior or senior standing. [3]

ES 3860. Undergraduate Research. [Formerly ES 248] Independent study under the direction of a faculty member with expertise in the area of study. [1-3 each semester]

ES 3884. Internship. Internship credit for work approved by the Associate Dean of the School of Engineering. A written scholarly project must be produced in the internship. Course must be taken P/F. May be repeated for credit; maximum of total 4 hours. No more than 2 hours may count toward degree requirements. FALL, SPRING, SUMMER. [1]

ES 3890. Special Topics. [Formerly ES 290] Technical elective courses of special current interest. No more than six semester hours of these courses may be credited to the student's record. Prerequisite: Consent of instructor. FALL, SPRING. [1-3]

ES 4951. Senior Capstone Experience. Based on project specifications typically supplied by industrial sponsors or part of a student's immersive experience. Students are responsible for the formulation, execution, qualification, and documentation of a culminating capstone experience. Application of knowledge acquired from earlier coursework, both within and outside the engineering core area, along with realistic technical, managerial, and budgetary constraints using standard systems engineering methodologies and practices. Prerequisite: Senior standing. Corequisite: ENGM 3700. SPRING. [3]

ES 4959. Senior Engineering Design Seminar. Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. FALL. [1]

Materials Science and Engineering

MSE 1500. Materials Science I. [Formerly MSE 150] Concepts of materials science developed from an understanding of the atomic and molecular structure of materials and their relationship to the properties of matter. Mechanical, electrical, physical, chemical, and magnetic properties of metals, ceramics, organics, composites, and semiconductors are covered. Corequisite: MSE 1500L. SPRING. [3]

MSE 1500L. Materials Science Laboratory. [Formerly MSE 150L] Laboratory for MSE 1500. One three-hour laboratory per week. Corequisite: MSE 1500. SPRING. [1]

MSE 2205. Strength and Structure of Engineering Materials. [Formerly MSE 232] Laboratory supplement to CE 2205. Students conduct experiments on the strength behavior of materials and simple engineering structures. Includes: tension and bending, fasteners, photoelastic analysis of stress concentrators, strain gage instrumentation to determine principal stresses, bending and deflection curves for simple beams, loaded columns, and short struts. Corequisite: CE 2205. FALL. [1]

MSE 2500. Materials Science II. [Formerly MSE 250] Microstructure and property characterization, materials selection, failure analysis, modern processing methods, and nanostructured materials. Case studies and challenge based learning are used to develop structure-processing concepts for the practice of materials science and engineering. Prerequisite: MSE 1500. FALL. [3]

MSE 3860. Undergraduate Research. [Formerly MSE 209C] Open to select engineering students to do research under the guidance of a faculty member. A formal written report is required. [1-3]

MSE 3889. Special Topics. [Formerly MSE 210A] Technical elective courses of special current interest. No more than two semesters of this course may be credited to the student's record. [Variable credit: 1-3 each semester]

MSE 3890. Special Topics. [Formerly MSE 210B] Technical elective courses of special current interest. No more than two semesters of this course may be credited to the student's record. Prerequisite: Consent of instructor. [Variable credit: 1-3 each semester] (Offered on demand)

MSE 6310. Atomic Arrangements in Solids. [Formerly MSE 310] Atomic arrangements in metals, ceramics, semiconductors, glasses, and polymers. Lattice geometry and crystal symmetry to describe crystal structures. Nanocrystalline materials. Scattering theory and diffraction phenomena for structural characterization. FALL. [3]

MSE 6343. Electron Microscopy. [Formerly MSE 343] Principles and applications of transmission electron microscopy in the study of materials. Electron scattering, image contrast theory, operation of electron microscope, and specimen preparation. Use of the electron microscope in experimental investigations. Two lectures and one laboratory period. FALL. [3]

MSE 6391. Special Topics. [Formerly MSE 391] Based on faculty research projects and highly specialized areas of concentration. FALL, SPRING. [Variable credit: 1-3 each semester]

MSE 6392. Special Topics. [Formerly MSE 392] Based on faculty research projects and highly specialized areas of concentration. FALL, SPRING. [Variable credit: 1-3 each semester]

MSE 7999. Master's Thesis Research. [Formerly MSE 369] [0-6]

MSE 8991. Seminar. [Formerly MSE 397] A required noncredit course for all graduate students in the program. Topics of special interest consolidating the teachings of previous courses by considering topics which do not fit simply into a single course category. FALL, SPRING. [0]

MSE 8992. Seminar. [Formerly MSE 398] A required noncredit course for all graduate students in the program. Topics of special interest consolidating the teachings of previous courses by considering topics which do not fit simply into a single course category. FALL, SPRING. [0]

MSE 8999. Non-Candidate Research. [Formerly MSE 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit: 0-12]

MSE 9999. Ph.D. Dissertation Research. [Formerly MSE 399] [0-12]

Mechanical Engineering

ME 1150. Automotive Components Seminar. [Formerly ME 150] General automotive knowledge for engineering and design considerations. Basic component function, terminology and design. Suspension (including suspension kinematics), steering (including steering geometry), driveline, transmission, engine and braking. [1]

ME 1151. Laboratory in Machining. [Formerly ME 151] Machining and fabrication of metals and plastics. Fabrication, design and manufacturability of parts or components. [1]

ME 1152. Laboratory in Welding. [Formerly ME 152] Theory of welding processes and welding of metals. Design, fabrication, and manufacturability of parts or components using welding processes. [1]

ME 1153. Computer Aided Design. [Formerly ME 153] Use of computers for solid modeling of machine parts and assemblies. [1]

ME 2160. Introduction to Mechanical Engineering Design. [Formerly ME 160] Design fundamentals, computer-aided design, machine fabrication techniques, technical drawing, team-based learning, and a comprehensive design project. Two lectures and one lab. Prerequisite: ES 1401-1403 and Mechanical Engineering major. FALL. [3]

ME 2171. Instrumentation Laboratory. [Formerly ME 171] Techniques associated with engineering measurements, curve fitting, presentation, and analysis of data. Corequisite: MATH 2300. SPRING. [2]

ME 2190. Dynamics. [Formerly ME 190] The principles of dynamics (kinematics and kinetics) of particles and rigid bodies. Mechanical vibrations. Continuous media. Prerequisite: CE 2200, PHYS 1601. Corequisite: MATH 2300. FALL, SPRING, SUMMER. [3]

ME 2220. Thermodynamics. [Formerly ME 220] Application of the first and second laws to energy transformation processes and properties of technologically important materials. Prerequisite: PHYS 1601, MATH 2300. FALL, SPRING, SUMMER. [3]

ME 3202. Machine Analysis and Design. [Formerly ME 202] Application of the principles of mechanics of materials to the analysis and synthesis of machine elements. Corequisite: CE 2205. FALL. [3]

ME 3204. Mechatronics. [Formerly ME 204] Design of analog and digital electromechanical sensors and actuators, signal and power electronics, and application of digital microcontrollers to mechatronic systems. Prerequisite: EECE 2112; CS 1101 or 1103 or 1104. SPRING. [3]

ME 3224. Fluid Mechanics. [Formerly ME 224] Physical properties of fluids, surface tension, viscosity; fluid statics and dynamics; control volume analysis of mass, momentum, and energy; dimensional analysis, similitude, and modeling; viscous flows in pipes; drag and lift on immersed bodies. Prerequisite: ME 2190, MATH 2420. Credit not awarded for both ME 3224 and CE 3700. FALL. [3]

ME 3234. Systems Dynamics. [Formerly ME 234] Energy-based modeling of dynamic mechanical, electrical, thermal, and fluid systems to formulate linear state equations, including system stability, time domain response, and frequency domain techniques. Three lectures and one three-hour laboratory. Prerequisite: ME 2190, MATH 2420. FALL. [4]

ME 3248. Heat Transfer. [Formerly ME 248] Steady-state and transient heat transfer by conduction, forced and free convection and radiation, including heat transfer by boiling and condensing vapors. Application is made to practical design problems. Prerequisite: ME 2220, ME 3224. SPRING. [3]

ME 3850. Independent Study. Under the direction of a faculty member, students study in a focused area of mechanical engineering culminating in an engineering report of the activities and findings. [1-3]

ME 3860. Undergraduate Research. [Formerly ME 209A/B/C] Under the direction of a faculty member, students conduct a research project. A formal, written report is required. [1-3]

ME 3890. Special Topics. [Formerly ME 210] Technical elective courses of special current interest. No more than six semester hours of this course may be credited to the student's record. FALL, SPRING, SUMMER. [Variable credit: 1-3 each semester] (Offered on demand)

ME 4213. Energetics Laboratory. [Formerly ME 213] Experimental methods in heat transfer, fluid mechanics, and thermodynamics as applied to energy conversion systems and their analyses. Prerequisite: Senior standing. FALL. [2]

ME 4221. Intermediate Thermodynamics. [Formerly ME 221] Application of principles of thermodynamics to vapor and gas cycles, mixtures, combustion, and compressible flow. Prerequisite: ME 2220. Corequisite: MATH 2420. [3]

ME 4226. Gas Dynamics. [Formerly ME 226] Compressible flow from subsonic to supersonic. Shock waves, expansion waves, shock tubes, and supersonic airfoils. Prerequisite: ME 3224. [3]

ME 4236. Linear Control Theory. [Formerly ME 236] Classical and modern approaches to the analysis and design of single-input/single-output (SISO) and multiple-input/multiple-output (MIMO) linear time invariant control systems. Classical (frequency-domain) and modern (state-space) approaches to SISO and MIMO control, including optimal control methods. Prerequisite: ME 3234. FALL. [3]

ME 4251. Modern Manufacturing Processes. [Formerly ME 251] Manufacturing science and processes. A quantitative approach dealing with metals, ceramics, polymers, composites, and nanofabrication and microfabrication technologies. Prerequisite: ME 3202. Corequisite: ME 4950. [3]

ME 4258. Engineering Acoustics. [Formerly ME 258] The wave equation and its solutions; acoustic sources; reflection and transmission of sound; propagation in pipes, cavities, and waveguides; noise standards and effects of noise on people; principles of noise and vibration control; signal processing in acoustics; environmental noise measurement and control; and various contemporary examples. Prerequisite: MATH 2400 or 2420. [3]

ME 4259. Engineering Vibrations. [Formerly ME 259] Theory of vibrating systems and application to problems related to mechanical design. Topics include single degree of freedom systems subject to free, forced, and transient vibrations; systems with several degrees of freedom, methods of vibration suppression and isolation, and critical speed phenomena. Prerequisite: ME 2190, MATH 2420. [3]

ME 4260. Energy Conversion. [Formerly ME 260] Energy resources, use, and conservation are studied. The fundamentals of positive displacement machinery, turbo-machinery, and reactive mixture are introduced and used to examine various forms of power-producing systems. Prerequisite: ME 2220, ME 3224. [3]

ME 4261. Basic Airplane Aerodynamics. [Formerly ME 261] Study of the atmosphere; analysis of incompressible and compressible flows, shock waves, boundary layer and skin friction drag, lift and drag forces over airfoils and wings, and flight performance; aircraft stability and control, wing icing, and parachute-based recovery; history of flight and aerodynamics. Corequisite: ME 3224. [3]

ME 4262. Environmental Control. [Formerly ME 262] Heating and cooling systems, energy conservation techniques, use of solar energy and heat pumps. Prerequisite: ME 2220. Corequisite: ME 3248. [3]

ME 4263. Computational Fluid Dynamics and Multiphysics Modeling. [Formerly ME 263] Computational modeling of viscous fluid flows and thermal-fluid-structure interaction. Computational techniques including finite-difference, finite-volume, and finite-element methods; accuracy, convergence, and stability of numerical methods; turbulence modeling; rotating machinery; multiphase flows; and multiphysics modeling. Prerequisite: ME 3224. SPRING. [3]

ME 4264. Internal Combustion Engines. [Formerly ME 264] Thermodynamics of spark ignition and compression ignition engines; gas turbines and jet propulsion. Prerequisite: ME 2220. [3]

ME 4265. Direct Energy Conversion. [Formerly ME 265] The principles and devices involved in converting other forms of energy to electrical energy. Conversion devices: electro-mechanical, thermoelectric, thermionic, fluid dynamic, and fuel cell. Prerequisite: ME 2220. [3]

ME 4267. Aerospace Propulsion. [Formerly ME 267] Application of classical mechanics and thermodynamics to rocket and aircraft propulsion. Design and performance analysis of air-breathing and chemical rocket engines. Advanced propulsion systems for interplanetary travel. Contemporary issues in aerospace propulsion: space exploration, renewable fuels. Prerequisite: ME 2220, ME 3224. [3]

ME 4271. Robotics. [Formerly ME 271] History and application of robots. Robot configurations including mobile robots. Spatial descriptions and transformations of objects in three-dimensional space. Forward and inverse manipulator kinematics. Task and trajectory planning, simulation and off-line programming. Prerequisite: MATH 2410. [3]

ME 4275. Finite Element Analysis. [Formerly ME 275] Development and solution of finite element equations for solid mechanics and heat transfer problems. Commercial finite element and pre- and post-processing software. Two lectures and one three-hour laboratory each week. Prerequisite: CE 2205, MATH 2420. [3]

ME 4280. Advanced Dynamics of Mechanical Systems. [Formerly ME 280] Development of methods for formulating differential equations to model mechanical systems, including formalisms of Newton-Euler, Lagrange, and virtual work methods to two- and three-dimensional systems. Prerequisite: ME 2190, MATH 2420. [3]

ME 4284. Modeling and Simulation of Dynamic Systems. [Formerly ME 284] Incorporates bond graph techniques for energy-based lumped-parameter systems. Includes modeling of electrical, mechanical, hydraulic,

magnetic and thermal energy domains. Emphasis on multi-domain interaction. Prerequisite: ME 3234. [3]

ME 4950. Design Synthesis. [Formerly ME 242] Development of the design process: problem definition, design specifications, solution identification, idea synthesis, modeling and simulation, and design completion. Critical elements include problem selection, idea synthesis, and proposal writing. Individual design synthesis study projects required. Prerequisite: ME 3202. FALL. [2]

ME 4951. Engineering Design Projects. [Formerly ME 243] Each student participates in a major group design project. Lectures will cover case studies and topics of current interest in design. Prerequisite: ME 4950. SPRING. [3]

ME 4959. Senior Engineering Design Seminar. [Formerly ME 297] Elements of professional engineering practice. Professionalism, licensing, ethics and ethical issues, intellectual property, contracts, liability, risk, reliability and safety, interdisciplinary teams and team tools, codes, standards, professional organizations, careers, entrepreneurship, human factors, and industrial design. Prerequisite: Senior standing. Corequisite: ME 4950. FALL. [1]

ME 5236. Linear Control Theory. [Formerly ME 336] (Also listed as ME 4236) Classical and modern approaches to the analysis and design of single-input/single-output (SISO) and multiple-input/multiple-output (MIMO) linear time invariant control systems. Classical (frequency-domain) and modern (state-space) approaches to SISO and MIMO control, including optimal control methods. No credit for students who have earned credit for 4236. [3]

ME 5251. Modern Manufacturing Processes. (Also listed as ME 4251) Manufacturing science and processes. A quantitative approach dealing with metals, ceramics, polymers, composites, and nanofabrication and microfabrication technologies. No credit for students who have earned credit for 4251. [3]

ME 5258. Engineering Acoustics. (Also listed as 4258) The wave equation and its solutions; acoustic sources; reflection and transmission of sound; propagation in pipes, cavities, and waveguides; noise standards and effects of noise on people; principles of noise and vibration control; signal processing in acoustics; environmental noise measurement and control; and various contemporary examples. No credit for students who have earned credit for 4258. [3]

ME 5259. Engineering Vibrations. (Also listed as ME 4259) Theory of vibrating systems and application to problems related to mechanical design. Topics include single degree of freedom systems subject to free, forced, and transient vibrations; systems with several degrees of freedom, methods of vibration suppression and isolation, and critical speed phenomena. No credit for students who have earned credit for 4259. [3]

ME 5260. Energy Conversion. (Also listed as ME 4260) Energy resources, use, and conservation are studied. The fundamentals of positive displacement machinery, turbo-machinery, and reactive mixture are introduced and used to examine various forms of power-producing systems. No credit for students who have earned credit for 4260. [3]

ME 5261. Basic Airplane Aerodynamics. (Also listed as ME 4261) Study of the atmosphere; analysis of incompressible and compressible flows, shock waves, boundary layer and skin friction drag, lift and drag forces over airfoils and wings, and flight performance; aircraft stability and control, wing icing, and parachute-based recovery; history of flight and aerodynamics. Corequisite: ME 3224. No credit for students who have earned credit for 4261. [3]

ME 5262. Environmental Control. (Also listed as ME 4262) Heating and cooling systems, energy conservation techniques, use of solar energy and heat pumps. No credit for students who have earned credit for 4262. [3]

ME 5263. Computational Fluid Dynamics and Multiphysics Modeling. (Also listed as ME 4263) Computational modeling of viscous fluid flows and thermal-fluid-structure interaction. Computational techniques including finite-difference, finite-volume, and finite-element

methods; accuracy, convergence, and stability of numerical methods; turbulence modeling; rotating machinery; multiphase flows; and multiphysics modeling. No credit for students who have earned credit for 4263. SPRING. [3]

ME 5264. Internal Combustion Engines. (Also listed as ME 4264) Thermodynamics of spark ignition and compression ignition engines; gas turbines and jet propulsion. No credit for students who have earned credit for 4264. [3]

ME 5265. Direct Energy Conversion. (Also listed as ME 4265) The principles and devices involved in converting other forms of energy to electrical energy. Conversion devices: electro-mechanical, thermoelectric, thermionic, fluid dynamic, and fuel cell. No credit for students who have earned credit for 4265. [3]

ME 5267. Aerospace Propulsion. (Also listed as ME 4267) Application of classical mechanics and thermodynamics to rocket and aircraft propulsion. Design and performance analysis of air-breathing and chemical rocket engines. Advanced propulsion systems for interplanetary travel. Contemporary issues in aerospace propulsion: space exploration, renewable fuels. No credit for students who have earned credit for 4267. [3]

ME 5271. Robotics. (Also listed as ME 4271) History and application of robots. Robot configurations including mobile robots. Spatial descriptions and transformations of objects in three-dimensional space. Forward and inverse manipulator kinematics. Task and trajectory planning, simulation and off-line programming. No credit for students who have earned credit for 4271. [3]

ME 5275. Finite Element Analysis. (Also listed as ME 4275) Development and solution of finite element equations for solid mechanics and heat transfer problems. Commercial finite element and pre- and post-processing software. Two lectures and one three-hour laboratory each week. No credit for students who have earned credit for 4275. [3]

ME 5280. Advanced Dynamics of Mechanical Systems. (Also listed as ME 4280) Development of methods for formulating differential equations to model mechanical systems, including formalisms of Newton-Euler, Lagrange, and virtual work methods to two- and three-dimensional systems. No credit for students who have earned credit for 4280. [3]

ME 5284. Modeling and Simulation of Dynamic Systems. (Also listed as ME 4284) Incorporates bond graph techniques for energybased lumped-parameter systems. Includes modeling of electrical, mechanical, hydraulic, magnetic and thermal energy domains. Emphasis on multi-domain interaction. No credit for students who have earned credit for 4284. [3]

ME 7899. Master of Engineering Project. [Formerly ME 389]

ME 7999. Master's Thesis Research. [Formerly ME 369] [0-6]

ME 8320. Statistical Thermodynamics. [Formerly ME 320] Old and modern quantum theory, including H atom, rigid rotor, and harmonic oscillator. Atomic and molecular structure and spectra. Maxwell-Boltzmann statistical model for ideal, chemically reacting, electron, or photon gas. Gibbs method. Prerequisite: ME 2220. [3]

ME 8323. Micro/NanoElectroMechanical Systems. [Formerly ME 323] Fabrication techniques and mechanical behavior of modern MEMS/NEMS structures. Application of NEMS/MEMS devices to sensing and actuation. [3]

ME 8326. Gas Dynamics. [Formerly ME 326] Study of compressible fluid flow from subsonic to supersonic regimes in confined regions and past bodies of revolutions. Includes heat transfer, frictional effects, and real gas behavior. Prerequisite: ME 3224. [3]

ME 8327. Energy Conversion Systems. [Formerly ME 327] An advanced study of energy conversion systems that include turbomachinery, positive displacement machinery, solar energy collection and combustion, with consideration for optimizing the systems. [3]

ME 8331. Robot Manipulators. [Formerly ME 331] Dynamics and control of robot manipulators. Includes material on Jacobian matrix relating velocities and static forces, linear and angular acceleration relationships,

manipulator dynamics, manipulator mechanism design, linear and non-linear control, and force control manipulators. Prerequisite: ME 4271. [3]

ME 8333. Topics in Stress Analysis. [Formerly ME 333] An investigation of thermal stress, transient stress, and temperatures in idealized structures; consideration of plasticity at elevated temperatures; and some aspects of vibratory stresses. [3]

ME 8340. Wireless Mechatronics. [Formerly ME 340] Design of mechatronic devices with emphasis on miniaturization and wireless transmission of data. Programming of wireless microcontrollers with data acquisition and transmission from sensors and to actuators. Group design project to simulate, fabricate, and test a miniaturized wireless robot. [3]

ME 8348. Convection Heat Transfer. [Formerly ME 348] A wide range of topics in free and forced convection is discussed. Solutions are carried out using analytical, integral, and numerical methods. Internal and external flows are considered for both laminar and turbulent flow cases. Convection in high speed flow is also studied. Prerequisite: ME 3248. [3]

ME 8351. Adaptive Control. [Formerly ME 351] Real-time parameter estimation methods. Self-tuning regulators. Model reference adaptive control. Adaptive control for nonlinear systems. A research project is required. Prerequisite: ME 5236. [3]

ME 8352. Non-linear Control Theory. [Formerly ME 352] Phase plane analysis, nonlinear transformations, Lyapunov stability, and controllability/observability calculations. A multidimensional geometric approach is emphasized. Prerequisite: MATH 2410. [3]

ME 8353. Design of Electromechanical Systems. [Formerly ME 353] Analog electronic design for purposes of controlling electromechanical systems, including electromechanical sensors and actuators, analog electronic design of filters, state-space and classical controllers, and transistor-based servoamplifiers and high voltage amplifiers. Significant laboratory component with design and fabrication circuits to control electromechanical systems. Implementation of digital controllers. Prerequisite: ME 3234. [3]

ME 8359. Advanced Engineering Vibrations. [Formerly ME 359] The development and application of Lagrange's equations to the theory of vibrations. Nonlinear systems and variable spring characteristics are analyzed by classical methods and by digital computer techniques. Applications to the design of high speed machines are emphasized. Prerequisite: ME 4259; MATH 3120, MATH 4110. [3]

ME 8363. Conduction and Radiation Heat Transfer. [Formerly ME 363] A comparative study of available methods for solution of single and multidimensional conduction heat transfer problems. Both steady and transient problems are considered. Mathematical and numerical methods are stressed. Radiant exchange between surfaces separated by non-participating media is studied. Numerical methods are developed and discussed for non-isothermal surfaces and combined radiation and conduction problems are solved. Prerequisite: ME 3248. [3]

ME 8364. Nanophotonic Materials. Physics, design, modeling, and applications of nanophotonic materials in modern optical systems. Topics include waveguides and chip-based photonics, photonic crystals, plasmonics, and metamaterials. [3]

ME 8365. Micro/Nano Energy Transport. [Formerly ME 365] Theoretical examination of energy transport by electrons and phonons and modeling of transport phenomena in crystalline solids at reduced length scales. Particle transport models and solution methods for energy carriers in the context of semiconductor electronics, direct energy conversion devices and nanostructure. [3]

ME 8366. Combustion. [Formerly ME 366] Processes, thermodynamics, chemical kinetics, premixed flame theory, diffusion flame theory, ignition and detonation. Prerequisite: ME 3224, ME 4221. [3]

ME 8391. Special Topics. [Formerly ME 391] A course based on faculty research projects and highly specialized areas of concentration. [Variable credit: 1-3 each semester]

ME 8393. Independent Study. [Formerly ME 393] Readings and/or projects on advanced topics in mechanical engineering under the supervision of the faculty. Consent of instructor required. [Variable credit: 1-3 each semester]

ME 8991. Seminar. [Formerly ME 397] [0]

ME 8999. Non-Candidate Research. [Formerly ME 379] Research prior to entry into candidacy (completion of qualifying examination) and for special non-degree students. [Variable credit 0-12]

ME 9999. Ph.D. Dissertation Research. [Formerly ME 399]

Nanoscience and Nanotechnology

NANO 3000. Materials Characterization Techniques in Nanoscale Engineering. [Formerly NANO 250] Principles and applications of advanced materials characterization techniques to characterize specimens and engineered structures at the nano/microscale. X-ray diffraction analysis, optical microscopy, electron microscopy, surface probe techniques, focused ion-beam instruments, Rutherford backscatter analysis and chemical microanalytical techniques, treated both qualitatively and quantitatively. Lectures alternate with laboratory on a weekly basis. Prerequisite: MATH 1301; CHEM 1602 or MSE 1500. FALL. [3]

Scientific Computing

SC 3250. Scientific Computing Toolbox. [Formerly SC 250] Use of computational tools in multiple science and engineering domains. Simulations of complex physical, biological, social, and engineering systems, optimization and evaluation of simulation models, Monte Carlo methods, scientific visualization, high performance computing, or data mining. Prerequisite: CS 2201 or 2204; MATH 1100 or higher. FALL. [3]

SC 3260. High Performance Computing. Parallel computing, grid computing, GPU computing, data communication, high performance security issues, performance tuning on shared-memory-architectures. Prerequisite: CS 2201 or 2204. SPRING. [3]

SC 3850. Independent Study. [Formerly SC 295A] Development of a research project by the individual student under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one director of the SC minor is required. Prerequisite: SC 3250. [1-3]

SC 3851. Independent Study. SC 3851. Independent Study. [Formerly SC 295B] Development of a research project by the individual student under the direction of a faculty sponsor. Project must combine scientific computing tools and techniques with a substantive scientific or engineering problem. Consent of both the faculty sponsor and one director of the SC minor is required. Prerequisite: SC 3250. [1-3 each semester]

SC 3890. Special Topics. [Formerly SC 290] [1-3]

SC 5250. Scientific Computing Toolbox. (Also listed as SC 3250) Use of computational tools in multiple science and engineering domains. Simulations of complex physical, biological, social, and engineering systems, optimization and evaluation of simulation models, Monte Carlo methods, scientific visualization, high performance computing, or data mining. No credit for students who have earned credit for 3250. FALL. [3]

SC 5260. High Performance Computing. (Also listed as SC 3260) Parallel computing, grid computing, GPU computing, data communication, high performance security issues, performance tuning on shared-memory-architectures. SPRING. [3]

SC 5890. Special Topics. (Also listed as SC 3890) No credit for students who have earned credit for 3890. [1-3]



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Peabody College

CAMILLA P. BENBOW, Ed.D., Dean
CRAIG A. SMITH, Ph.D., Senior Associate Dean for Undergraduate Education
XIU CHEN CRAVENS, Ph.D., Associate Dean for International Affairs
DAVID K. DICKINSON, Ed.D., Associate Dean for Research
JEANETTE MANCILLA-MARTINEZ, Associate Dean for Graduate Education
JOSEPH F. MURPHY, Ph.D., Associate Dean for Special Projects
JACCI L. RODGERS, Ph.D., Associate Dean for External Affairs
SHARON L. SHIELDS, Ph.D., Associate Dean for Professional Education
BETTY S. LEE, M.Ed., Assistant Dean, Office of Academic Services
MONIQUE ROBINSON-NICHOLS, Ed.D., Assistant Dean for Student Affairs
DAWN HALE, M.L.A.S., Assistant to the Dean

Endowed Chairs and Named Professorships

Patricia and Rodes Hart Dean of Education and Human Development
Patricia and Rodes Hart Professor of Educational Neuroscience
Patricia and Rodes Hart Professor of Psychology and Human Development
Patricia and Rodes Hart Professor of Educational Leadership and Policy
Frank W. Mayborn Professor
Dunn Family Chair in Educational and Psychological Assessment, Special Education
Currey-Ingram Chair in Special Education
Nicholas Hobbs Chair in Special Education
Betts Professor of Education and Human Development
Antonio M. and Anita S. Gotto Chair in Teaching and Learning
Margaret Cowan Chair in Teacher Education
Susan Gray Chair in Education and Human Development
Cornelius Vanderbilt Chair

Faculty Council

peabody.vanderbilt.edu/faculty/faculty-research/faculty_council.php

Council on Teacher Education

Camilla P. Benbow, Chair.

Faculty

For a list of current faculty, please visit virg.vanderbilt.edu/webtools/registry.

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Education and Human Development at Vanderbilt

George Peabody College for Teachers, recognized for more than a century as one of the foremost independent colleges of teacher education, merged with Vanderbilt University in the summer of 1979 to become Vanderbilt University's Peabody College of education and human development. Since then, Peabody College has retained its heritage while achieving new stature as a place where world-class research is conducted and translated into teaching, practice, policy, and service. Peabody's mission is characterized by practice-oriented academic programs, a strong service ethic, groundbreaking research, and a pressing concern for addressing social problems in domestic and international contexts.

The college's faculty and students constitute a vibrant intellectual community answering pressing questions and expanding knowledge about PreK–12 and higher education, including special education; psychology, especially focused on families and children; the development of individuals and organizations; and educational administration, leadership, and policy. Peabody College understands the preparation of researchers, teachers, and leaders as among the most important things it does, and that building and sustaining an engaged academic community of learners is central to achieving its mission.

Peabody faculty and students engage in a broad spectrum of basic and applied research to generate new knowledge and translate that knowledge into practice. Current research findings inform classroom teaching at Peabody in every program. Moreover, Peabody faculty bring an interdisciplinary and entrepreneurial spirit to the research enterprise. Working collaboratively, often through one of the college's research centers, faculty and students publish and present their findings, apply them in real-world settings, and help to shape public debate about the nature and future of education and human development.

The college is devoted to enhancing opportunity in an increasingly diverse society. More than 1,900 students are enrolled at Peabody, with more than one-third of them in post-baccalaureate graduate or professional degree programs.

All teacher education programs are accredited by the Council for the Accreditation of Education Preparation (CAEP). Counseling programs are accredited by the Council for the Accreditation of Counseling and Related Education Programs (CACREP).

Centers and Outreach Efforts

Accelerated Academic Achievement (A3) Center

Funded with a grant of \$10 million by the National Center for Special Education Research, the A3 Center enables researchers to study instructional programs aimed at students with learning disabilities in grades 3 to 5. Scholars affiliated with the center seek to develop and test strategies to improve reading and math success. The new instructional programs developed at the center will help educators address challenges such as how to assist students in progressing to more complex subject matter and how to transfer learning between different intellectual tasks.

Center for Research on Rural Families and Communities

The Center for Research on Rural Families and Communities serves as a change agent in promoting the well-being of families and youth residing in rural communities. It does so by collaborating with community stakeholders to develop and conduct research benefiting community residents; designing preventive interventions that promote positive development, adjustment, and adaptation; implementing efficacy trials and disseminating effective interventions; conducting studies to advance knowledge about social, economic, and environmental impacts on rural culture and rural health disparities; and informing effective policy interventions.

Classroom Organization and Management Program (COMP)

COMP's primary goal is to help teachers improve their overall instructional and behavioral management skills through planning, implementing, and maintaining effective classroom practices. The program also seeks to improve student task engagement and reduce inappropriate and disruptive behavior through well-planned academic tasks and activities.

IRIS Center

The IRIS Center for Training Enhancements was designed in response to a request from the U.S. Department of Education's Office of Special Education Programs. This national effort, serving college faculty working in pre-service preparation programs, aims to ensure that general education teachers, school administrators, school nurses, and school counselors are well prepared to work with students who have disabilities and with their families. IRIS is the nation's only faculty enhancement center established for this purpose.

National Center for Leadership in Intensive Intervention

The National Center for Leadership in Intensive Intervention prepares special education leaders to provide intensive intervention to students with disabilities who have persistent and severe academic and behavioral difficulties. Funded by the Office of Special Education Programs, the center is composed of a consortium of universities including Vanderbilt, Southern Methodist University, the University of Connecticut, the University of Illinois at Chicago, the University of Minnesota, the University of Texas at Austin, and Virginia Commonwealth University.

National Center on Scaling Up Effective Schools

The National Center on Scaling Up Effective Schools is a collaborative partnership of research universities, education support providers, and two large urban school districts to identify the essential programs, practices, processes, and policies that make some high schools particularly effective with low-income students, minority students, and English language learners. The center works with teachers and school district leaders to share these practices with less-effective schools.

Next Steps at Vanderbilt

Next Steps at Vanderbilt is a two-year, nonresidential certification program for students with intellectual and developmental disabilities, providing individualized programs of study in the areas of education, social skills, and vocational training. Next Steps is a comprehensive transition program designated by the U.S. Department of Education. This status recognizes the program's merits and allows eligible students to apply for federal financial aid for tuition assistance.

Peabody Journal of Education

The *Peabody Journal of Education*, an interdisciplinary scholarly publication, fosters the development and dissemination of knowledge related to important questions of education and human development. The journal, in publication since 1923, is published quarterly and distributed across the United States and in twenty-five foreign countries.

Peabody Professional Institutes

Peabody Professional Institutes (PPI) provide short-term, intensive educational experiences for professional educators and administrators from across the nation and around the world. Each institute draws from social science disciplines and professional fields of study to inform the creation of a comprehensive, yet focused, curriculum. Designed with the same expectations for rigor and depth as Peabody College degree programs, PPI rest on the philosophy that good practice is best derived from and informed by a strong theoretical base.

Peabody Research Institute

The Peabody Research Institute (PRI) conducts research aimed at improving the effectiveness of programs for children, youth, and families. This mission encompasses educational programs and other interventions aimed at increasing the well-being of children and their families. Research may address any aspect of relevant practices, programs, or policies—e.g., their effectiveness, implementation, costs, dissemination, or social/political support—but the emphasis is on evaluating their effects on the children and families they serve. To bridge between research and practice, PRI also provides technical assistance and consultation to programs, practitioners, and policy makers aimed at improving services for children and families.

Principals Leadership Academy of Nashville

The Principals Leadership Academy of Nashville is a joint undertaking of Peabody, the Nashville Public Education Foundation, and Metropolitan Nashville Public Schools. The academy develops educational leaders for the Nashville school system who are creative and courageous professionals capable of encouraging the best practices in teaching and learning.

Study of Mathematically Precocious Youth

The Study of Mathematically Precocious Youth (SMPY) is a fifty-year longitudinal study of five cohorts, consisting of more than 5,000 intellectually talented individuals, identified over a twenty-five-year period (1972–1997). The aim of this research is to develop a better understanding of the unique needs of intellectually precocious youth and the determinants of the contrasting developmental trajectories they display over the lifespan.

Susan Gray School for Children

The Susan Gray School for Children is an inclusive early childhood education program serving young children with

and without disabilities, on site and in the community. The mission of the Susan Gray School is to provide high-quality services to children, families, and the community; to help train university students who plan to be teachers, health care providers, therapists, and researchers; to facilitate research; and to demonstrate high-quality early childhood education and special education practices.

Tennessee Education Research Alliance

The Tennessee Education Research Alliance is a unique research partnership committed to informing Tennessee's school improvement efforts with useful, timely, and high-quality studies. TERA brings together the policy leadership of the Tennessee Department of Education with the world-class expertise of Vanderbilt's Peabody College of education and human development to carry out research that helps drive the state's strategies for improving teaching and learning and contributes to the national conversation on education policy and practice. Guided by a steering committee of Peabody and TDOE officials, and with input from a broad-based advisory council of stakeholders, TERA directs scholarship and publishes and widely disseminates briefs, reports, and research syntheses that help policy-makers and practitioners to better understand core challenges, design and improve solutions, and evaluate results.

Vanderbilt Center for Science Outreach

The Vanderbilt Center for Science Outreach (CSO) is dedicated to enhancing literacy in science, technology, engineering, and mathematics (STEM) through the establishment of unique partnerships between university scientists, K–12 educators and students, and the local and global science community. CSO has developed and implemented a number of education programs in partnership with local and national K–12 classrooms, including the School for Science and Math at Vanderbilt. These efforts have reached thousands of children, supported teachers in residence on the Vanderbilt campus, hosted summer professional development courses and workshops for teachers, offered summer programs for students, and placed teachers and students in research laboratories. As a national leader in outreach efforts, the CSO is committed to elevating pre-collegiate STEM expertise and literacy.

Vanderbilt Kennedy Center for Research on Human Development

The Vanderbilt Kennedy Center is one of fourteen national centers for research on intellectual disabilities and developmental disorders. Its primary mission is to better understand human development, to prevent and solve developmental problems, and to enable persons with developmental disabilities to lead fuller lives. The Kennedy Center is a university-wide center with institutional support shared by Peabody College, the School of Medicine, and the College of Arts and Science.

Vanderbilt Programs for Talented Youth

Vanderbilt Programs for Talented Youth seeks to identify and aid academically talented youth from diverse educational, racial, and economic backgrounds by providing academic enrichment and challenge, while fostering balance and healthfulness in their lives. Begun in 2000 as a summer residential academic program, Programs for Talented Youth has expanded its mission and programming to provide engaging and intellectually appropriate educational opportunities to precocious young students, and to offer support for parents and educators year-round.

The Undergraduate Program

PEABODY College offers the bachelor of science with majors in early childhood and elementary education, secondary education, special education, cognitive studies, child development, child studies, and human and organizational development. These undergraduate programs are designed to prepare students for professional careers in their chosen fields. Programs for Peabody students include course work in a Liberal Education Core, a professional core, a major area of specialization, and electives. Peabody also provides professional education courses for College of Arts and Science students who want to prepare for teacher licensure.

The bachelor of science is granted on the basis of 120 semester hours of college work with a final grade point average of 2.000, and completion of the Liberal Education Core and the requirements of the major.

Liberal Education Core Program

In pursuit of breadth of knowledge and understanding about the world in which they live, all undergraduates complete the requirements of the Liberal Education Core program. This Liberal Education Core component of all Peabody undergraduate majors is intended to provide students with a solid foundation in the arts and sciences. The core curriculum incorporates the study of human conditions that are universal. The Liberal Education Core involves study in the following areas:

Communications. The study of language in its written and spoken forms.

Mathematics/Quantitative Analysis. The study of mathematical concepts and procedures.

Social Sciences. The study of the past—both the heritage of the United States and the more global human story. The study of growth and development of individuals.

Humanities. The study of the universal language of the arts.

Natural Sciences. The study of scientific process and interrelationships among the sciences.

Through the study of these universal subjects, concepts, and modes of thought, students gain a broad foundation transferable to their futures. They will continue to grow within society and the classroom and will look at problems from different perspectives while maintaining curiosity.

Courses identified to fulfill the Liberal Education Core requirement for each undergraduate major are listed in Peabody's *Undergraduate Handbook* (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Courses used to satisfy these core requirements may also be counted toward the fulfillment of requirements in an academic major. Special topics courses are ordinarily not acceptable for meeting Liberal Education Core requirements. These courses require prior approval as substitute courses. Independent study courses are not acceptable for meeting Liberal Education Core requirements.

Transfer students may use credits from other colleges to fulfill Peabody's Liberal Education Core requirements if the credits are equivalent to the courses offered at Vanderbilt. The use of transfer courses to satisfy Liberal Education Core requirements must be approved by the Dean's Office. For transfer students, credits are evaluated when the student enrolls at Peabody in order to determine which transfer courses will substitute for Peabody's Liberal Education Core requirements. Requirements still to be fulfilled will be noted at that time.

Licensure for Teaching

PEABODY offers programs leading to teacher licensure in the following areas: *early childhood (grades PreK–3), elementary (grades K–5), and secondary education (grades 6–12) with endorsement in English, math, biology, chemistry, physics, earth science, history, and political science.* (Added endorsements are available also in *economics, psychology, and sociology for those who will have a history endorsement.*) An added endorsement program also is available in *English as a Second Language (grades PreK–12)*. All of these programs are offered by the Department of Teaching and Learning.

Special education–interventionist (LD/BD for grades K–8 or 6–12) or comprehensive (multiple/severe for grades K–12) are offered by the Department of Special Education.

Vanderbilt’s Blair School of Music and Peabody College offer a program for students interested in teacher licensure with endorsement in the following: (1) *instrumental/general music (grades K–12), or (2) vocal/general music (grades K–12)*. Blair students complete the first part of the program as part of the bachelor of music degree and apply during the senior year to continue into the master of education degree for a final year of professional education.

Students seeking licensure may enroll in Peabody College, the College of Arts and Science, or the Blair School of Music. In all cases, most of the liberal arts course work is taken in the College of Arts and Science, and the professional education course work is taken at Peabody College.

All students completing a teacher education program at Vanderbilt are strongly advised to apply for a license in Tennessee whether or not they plan to teach in this state. In addition, licensure is available by application in other states. The student is responsible for applying for Tennessee licensure through the Office of Teacher Licensure located in the Peabody Administration Building. Each state has its own application forms and procedures for licensure; information is available in the Office of Teacher Licensure.

Licensure requirements continue to undergo revision. Students must meet licensure requirements in effect at the time of their program completion, which may be different from requirements in effect at the time they entered the program. Each year, teacher education students should consult the current Vanderbilt *Undergraduate Catalog* or the Peabody *Undergraduate Handbook*. The licensure website (peabody.vanderbilt.edu/admin-offices/teacher-licensure/index.php) provides additional information.

Security Clearance

During the first two weeks of enrollment in a teacher preparation program, a student must be fingerprinted in Tennessee for a criminal background check by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation. The student must register online to pay the fee. Before background clearance, the student must read the Background Clearance Consent/FERPA Statement/Applicant’s Privacy Rights/Privacy Act Statement. The student must complete an online data entry form acknowledging their agreement to the conditions listed in the required readings. Among other agreements is the expectation to notify the Peabody background clearance officer if an infraction occurs at any time during enrollment in the program. Contact the

Office of Background Clearance at Peabody (bco@vanderbilt.edu) or visit vu.edu/peabodybco for additional information.

Degree Audits

Electronic degree audits enable students and faculty advisers to track each student’s progress in the degree program at Peabody. The departmental handbooks describe access to and use of online Peabody major degree audits to view program requirements recognized as “met” or “unmet” at any time in the student’s program. The degree audit also denotes permissions for waivers or course substitutions. Degree audits are managed in the Peabody Office of Academic Services.

SCREENING

There are two points in each teacher education program when undergraduates must complete applications for screenings by departmental faculty. Screening requirements continue to undergo revision and are subject to change. Students must meet screening requirements in effect at the time of their application, which may be different from requirements stated below. Screening reviews, described below, are important checkpoints that allow successful students to advance in the program. Attainment of 2.75 (4.0) cumulative grade point average and completion of required courses do not automatically qualify a student for continuation in the program.

Faculty evaluation of a student’s qualifications for continuation in a teacher education program include academic, performance, and disposition factors such as the following:

1. Dependability (as evidenced by good attendance in classes and practica and the completion of required assignments and procedures on time)
2. Professional and ethical behavior (honesty, acceptance of responsibility, emotional maturity, etc.)
3. Attitude and interpersonal skills (including the ability to work with children and with peers)
4. Academic competence (It is possible for a student to meet minimum grade point requirements and pass all courses and still have specific academic weaknesses which might cause denial of screening applications.)
5. Teaching competence (as evidenced by successful completion of practica requirements). It is possible for a student to meet minimum grade point requirements and pass all courses and still have specific performance weaknesses which might cause denial of screening applications.

Students seeking teacher licensure must be approved by each department through which licensure is sought. Secondary licensure candidates should contact an adviser or the director of undergraduate studies in the appropriate Arts and Science department(s) to be informed of any specific departmental requirements or standards.

These criteria rest on the professional judgment of faculty members. Whether a student meets them or not is determined by a vote of appropriate faculty. Undergraduate students seeking secondary education licensure must be approved by the Department of Teaching and Learning faculty and also by the

faculty of College of Arts and Science department(s) for the Arts and Science major(s).

Screening deadlines are October 1 and February 1. Undergraduates must apply for Screening I during spring of the sophomore year or fall of the junior year. Screening II must be done in the fall of the senior year, restricting undergraduate student teaching in special education and secondary education to the spring of the senior year.* Deadlines are firm; late applications will not be accepted. The Screening I and II application form is online at peabody.vanderbilt.edu/admin-offices/teacher-licensure/licensure_for_undergraduate_students/screening.php and should be submitted online no later than the deadline.

(NOTE: Screening II applications require additional documents when submitted. See specific requirements with the application.)

Students will be notified of results of the faculty vote at the end of the screening semester. In instances where there is a negative decision, the student wishing to appeal must do so in writing to the chairperson(s) of the department(s) denying the application. If the initial decision is upheld and the student wishes to continue the appeal, a written petition should be filed with the Administrative Committee of Peabody College.

* Screening II applications for student teaching in Early Childhood or Elementary Education may be submitted in the second semester of the junior year for fall student teaching.

Screening I (Formal Admission to an Undergraduate Teacher Education Program)

Each student seeking teacher licensure must be formally admitted to the teacher education program(s) by completing an online application for Screening I review by the faculty of the department(s) in which endorsement(s) is/are sought. Candidates normally apply for Screening I during spring of the sophomore year or fall of the junior year, depending on their program area (candidates should consult their department handbook for timelines in their program area). Deadlines are February 1 in the spring and October 1 in the fall. Students who transfer more than 60 hours to Vanderbilt from another institution must apply for admission to the teacher education program by the screening deadline of their second semester at Vanderbilt.

An initial screening review by the faculty will occur soon after the Screening I deadline. If there are concerns noted, the student will be counseled. The final faculty review and decision will be done toward the end of the semester.

Criteria for Screening I (formal admission to teacher education) are:

A. Specific Academic Criteria

1. Test scores (SAT composite score of 780 or ACT 21, OR passing scores on the Praxis I Core Academic Skills for Educators)
2. Minimum cumulative grade point average of 2.75 (4-point scale)
3. Successful completion of at least two of the required professional education courses as defined by the program area with a minimum grade of C+
4. Department interview

B. Specific Faculty Evaluative Criteria

The faculty will consider the disposition criteria of dependability, professional and ethical behavior, attitude and interpersonal skills, and teaching competence as itemized at the beginning of the Screening section.

Screening II (Admission to Student Teaching)

Admission to Student Teaching is not automatic when prerequisite course work and field experiences have been completed. Special education majors and secondary education majors must submit the online Screening II application in the fall of the senior year. For elementary majors and early childhood majors in the Department of Teaching and Learning, the student must submit the online Screening II application the semester prior to the one during which a student is to student teach. Secondary education majors may student teach in spring semesters only, so they must apply for Screening II in the fall semester of their senior year. Deadlines are October 1 for fall semesters, February 1 for spring semesters. At the time of screening application, the student should be enrolled in any remaining prerequisite courses. **No course work may be taken during the semester of student teaching and seminar.**

After an initial review in the Office of Teacher Licensure, the Screening II application and other submitted materials will be considered by departmental faculty according to the following criteria for Screening II approval to student teach:

A. Specific Academic Criteria

1. Formal admission to a teacher education program granted (completion of Screening I)
2. Second semester junior standing (for student teaching in the fall of the senior year) or first semester senior standing (for student teaching in the spring of the senior year)
3. Successful completion (C+ or above) of all courses required and prerequisite to student teaching as defined by the program area
4. Minimum cumulative grade point average of 2.75 (4.0 scale)
5. Satisfactory performance (C+ or above) in course work in areas in which teacher licensure is sought
6. Successful completion of Standard First Aid and CPR training (attach certificate copies to the Screening II application)

B. Specific Faculty Evaluative Criteria

The faculty will consider the disposition criteria of dependability, professional and ethical behavior, attitude and interpersonal skills, and teaching competence as itemized at the beginning of the Screening section.

Each Screening II application requires additional documents, depending on the program. A copy of first aid and CPR verification of training completed within the previous two years must be submitted to the Office of Teacher Licensure by the October 1 or February 1 deadline. In addition, some programs have additional requirements that are prerequisite to Screening II application. Students should consult departmental handbooks. Screening II applicants who are approved to student teach will receive notification of their student teaching placements no later than during the Student Teacher Orientation at the beginning of the student teaching semester.

Students who have passed Screening II are assigned two specific student teaching placements in the Nashville area.

Student Teaching

Vanderbilt students seeking teacher licensure must successfully complete a 15-week semester of full-time student teaching in two different grade levels in Nashville area public schools and must be recommended for licensure by the supervisors of student teaching and departmental faculty. Students seeking early childhood or elementary licensure may apply for fall or spring student teaching. Secondary education and special education student teaching may be done only in the spring semester. Prior to the start of student teaching, all prerequisite courses must have been completed, the cumulative GPA must be at least 2.75, and the appropriate departmental faculties must have voted to approve the candidate for student teaching during the previous semester as part of the Screening II application process. The Tennessee State Department of Education and Metropolitan Nashville Public Schools prohibit student teachers from taking courses during student teaching. See the departmental *Undergraduate Handbook* for details.

Application for Teacher Licensure and University Recommendation for Licensure

All students completing the teacher education program at Vanderbilt are strongly advised to apply for a license in Tennessee whether or not they plan to teach in this state. In addition, licensure is available in most other states. The student is responsible for applying for Tennessee licensure through the Office of Teacher Licensure located in the Peabody Administration Building. Each state has its own application forms and procedures for licensure; information is available in the Office of Teacher Licensure.

To be licensed through Vanderbilt's teacher education program, a graduate must earn a positive licensure recommendation from the university. The university's decision to recommend a candidate is based upon the following:

1. Maintaining the grade point average required for admission to the teacher education program (2.75 on a 4.0 scale).
2. For Tennessee licensure, achieving the state minimum score on all required parts of the PRAXIS II Series and edTPA (scores must be sent to the Vanderbilt Office of Teacher Licensure—code R 1871, and the Tennessee Department of Education—code R 8190).*
3. Receiving a positive recommendation from the student's department as a result of the student teaching experience (Pass in student teaching does not guarantee a favorable recommendation).

* Testing requirements are changing almost annually; check instructions in the Office of Teacher Licensure or at peabody.vanderbilt.edu/admin-offices/teacher-licensure/index.php before registering to take the exams.

Accreditation

Vanderbilt University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award bachelor's, master's, professional, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call (404) 679-4500, or visit sacscoc.org for questions about the accreditation of Vanderbilt University.

Please contact the commission only in relation to Vanderbilt's noncompliance with accreditation requirements. Normal inquiries about admission requirements, educational programs, and financial aid should be directed to the university.

Vanderbilt is accredited by the Council for the Accreditation of Education Preparation (CAEP). Its teacher licensure programs also are approved by the Tennessee Department of Education and the following specialty professional associations:

- National Council for Teachers of English (NCTE)
- Council for Exceptional Children (CEC)
- National Association for the Education of Young Children (NAEYC)
- Association for Childhood Education International (ACEI)
- National Association for Schools of Music (NASM)

Academic Regulations

Honor System

All academic work at Vanderbilt is done under the honor system. (See the Honor System section in Life at Vanderbilt.)

Academic Advising

Each Peabody undergraduate is assigned an academic adviser who is familiar with his or her major. This adviser is generally a faculty member in the major department and is knowledgeable about the courses the student will need to complete his or her major. The adviser helps the student determine the courses that are most suitable for the chosen major and serves as a mentor to the student.

However, enrollment in appropriate courses to fulfill degree requirements and knowledge of university policies and regulations regarding courses are the responsibility of the individual student.

Class Attendance

Students are expected to attend all scheduled meetings of classes in which they are enrolled; they have an obligation to contribute to the academic performance of all students by full participation in the work of each class. At the beginning of the semester, instructors explain the policy regarding absences in each of their classes, and thereafter they report to the office of the dean of the college the name of any student whose achievement in a course is being adversely affected by excessive absences. In such cases, the dean, in consultation with the instructor, takes appropriate action, which may include dropping the student from the class; students dropped after the deadline for withdrawal receive the grade *F*. Class attendance may be specified as a factor in determining the final grade in a course, and it cannot fail to influence the grade even when it is not considered explicitly.

Course Load

A student must be enrolled in a minimum of 12 hours to be classified as a full-time student. Students wishing to carry more than 18 hours must obtain the approval of the dean of Peabody Student Affairs Office. All undergraduate students are assumed to be full-time students for the purpose of administering probation and retention policies. A student who for reasons of health, family, or outside employment wishes to enroll in Peabody as a part-time student must obtain permission from the dean of Peabody Student Affairs Office. The academic standing of such students will be considered on an individual basis. Normally, however, a student earning less than 12 hours will either be placed on academic probation or issued an academic warning.

Residence Requirement

Students must complete a minimum of 60 hours in residence at Vanderbilt including the final two semesters.

Credit by Examination

In certain circumstances students may be awarded course credit by departmental examination. (This procedure is distinct from the award of credit through the College Board Advanced Placement Tests taken prior to a student's first enrollment.)

Students wanting to earn credit by departmental examination should consult the Peabody Office of Academic Services concerning procedures. To be eligible, students must be carrying a minimum of 12 hours and be in good standing.

Students must obtain the approval of the chair of the department that is to give the examination and the instructor designated by the chair. Students may earn up to 8 hours of credit by examination in any one department. Students may attempt to obtain credit by examination no more than twice in one semester and no more than twice in one course. Students may not repeat a course for grade replacement under the credit by examination procedures.

Credit hours and grade are awarded on the basis of the grade earned on the examination, subject to the policy of the department awarding credit. Students have the option of refusing to accept the credit hours and grade after learning the results of the examination.

Students enrolled for at least 12 hours are not charged extra tuition for hours earned through credit by examination, so long as the amount of credit falls within the allowable limits of an 18-hour tuition load, including no-credit courses and courses dropped after the change period. Students in this category must pay a \$50 fee for the cost of constructing, administering, and grading the examination. Since this cost has already been incurred, students who refuse the credit hours and grade are charged the \$50 fee nevertheless.

Full-time students with a tuition load exceeding 18 hours and students taking fewer than 12 hours pay tuition at the hourly tuition rate.

Liberal Education Core Guidelines

Applicants to Peabody College will be required to take the SAT I or ACT writing test and the SAT II mathematics test. Students with majors in human and organizational development, cognitive studies, child studies, or child development do not need the SAT II mathematics test. The following application of these scores will be made to the Peabody Liberal Education Core:

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

First-year seminars (courses labeled 1111) offered through the College of Arts and Science and Blair School of Music may count as writing-intensive courses. Peabody freshmen may register for first-year seminars when open registration begins.

Mathematics:

Students with first majors in early childhood and elementary, secondary, or special education with an SAT II Mathematics test score

at or above 620 (Level I) or at or above 570 (Level II) are exempt from three hours of the math component of the Liberal Education Core mathematics category. Students with an exemption must take an additional three credit hours in their Liberal Education Core elective category to have the minimum required sixty-hour core. Students must take a statistics course if required for their major.

Students with first majors in child development, child studies, cognitive studies, or human and organizational development must take six hours as stated in the Liberal Education Core mathematics category.

Undergraduate Enrollment in 5000–8000-level Courses

All students wishing to take 5000–8000-level courses for either undergraduate or graduate credit must obtain the written approval of their academic advisers, the instructor of the course, and the Office of Academic Services. Some courses are designed to enroll both undergraduate and graduate/professional students in the same class section. Such courses will typically have two course numbers, one in the graduate range (5000–8000) and one in the undergraduate range (usually either 3000– or 4000–level). Unless they wish to take the course for post-baccalaureate credit, undergraduates must register for the course using the undergraduate course number and may do so without any special permission. Undergraduates wishing to receive approval for graduate credit in 5000–8000-level courses also see below.

Undergraduate Enrollment for Post-Baccalaureate Credit

A qualified Vanderbilt University senior undergraduate may enroll in courses approved for post-baccalaureate credit and receive credit which, upon the student's admission into a Peabody College professional program, may be applicable toward the professional degree. The principles governing this option are as follows:

1. Work taken under this option is limited to those 5000–8000-level courses approved for post-baccalaureate credit, excluding thesis and dissertation research courses and similar individual research and readings courses.
2. Such work must be in excess of that required for the bachelor's degree.
3. At the time of registration, the student must have a *B* average in all prior work to be counted toward the bachelor's degree, or a *B* average in all prior work to be counted toward the undergraduate major, or a *B* average in the preceding two semesters.
4. Undergraduate students wishing to count for post-baccalaureate credit courses taken under this option must consult the instructor of each course and must, at the time of registration, declare their intention on a form available at the Office of Academic Services.
5. The student's total course load (graduate plus undergraduate courses) must not exceed 15 hours during any semester in which graduate credit is pursued.
6. Permission for Vanderbilt undergraduates to enroll in post-baccalaureate courses does not constitute a commitment on the part of any department to accept the student in the future. Courses taken under this option are subject to departmental approval before they may be included on post-baccalaureate programs of study.

7. An undergraduate student exercising this option will be treated as a post-baccalaureate student with regard to class requirements and grading standards.

Interested students should consult the Peabody Office of Academic Services to verify their eligibility as defined above before attempting to register for post-baccalaureate course work under this option.

Undergraduate Enrollment for an Independent Study

Independent study courses, ranging from one to three hours of credit, are listed in the *Schedule of Courses* and are intended for students in their junior and senior years. Students wanting to undertake an independent study must follow these guidelines:

1. Students must be in academic "good standing" (may not be on probation or Leave of Absence).
2. Students must arrange the independent study with a Vanderbilt full time faculty member who has agreed to supervise and grade this experience.
3. Students may enroll for up to 3 hours of independent study in one semester.
4. Students must make a written study plan detailing the nature of the project and the amount of credit. The Individual Learning/Directed Study contract must be approved by the instructor and the department chair (or the chair's designee) by the last day of the change period.
5. Registration for the course occurs when the completed Individual Learning/Directed Study contract is submitted to the Peabody Office of Academic Services. Registration for an independent study will not be allowed after the change period has ended.

Students may not repeat independent study courses for grade replacement.

Transfer Credit/Summer or Other Courses Off Campus

Students who transfer from another institution must have a final transcript sent directly to the Undergraduate Admissions Office, Vanderbilt University. Upon acceptance, students will be asked to submit course descriptions and syllabi for all proposed transfer credit. Upon acceptance, courses will be evaluated by Vanderbilt to determine which courses will transfer and which requirements (e.g., Liberal Education Core, professional core) are met by the transfer courses. No course for which a student received the grade *D+* or lower will transfer. Course work transferred to Vanderbilt from another institution will not carry with it a grade point average.

Transfer students must complete at least 60 hours of work at Vanderbilt. Two of the four semesters in residence must be the last two semesters of the student's degree program.

Peabody students who wish to take course work during the summer, or during an academic-year semester, at a regionally accredited two-year or four-year college or university and transfer up to 12 hours to Vanderbilt must be in good standing with at least a *C* average. Prior approval must be granted for all courses to be taken elsewhere. If the courses are to be taken during the academic year, the student must take a personal leave explicitly approved for this purpose by the Peabody Dean's Office. Students on leave for other reasons (e.g., medical or other personal reasons) cannot take course work elsewhere for transfer credit without prior permission. Course work transferred to Vanderbilt from another institution will not carry with it a grade point average.

Requests to participate in non-Vanderbilt-approved overseas programs for transfer credit will be approved only under exceptional circumstances in which the proposed program represents a truly unique and unusual educational opportunity. To apply for approval, the student should complete the transfer of credit application and apply for a leave of absence for the relevant semester. The student must be in good standing with at least a 2.700 grade point average as of the date of application, and approval must be granted in advance of the study overseas. Petitions for leaves of this type must be filed at least one month before the close of the preceding semester, and final approval of such petitions always rests with the dean's office. It should be noted, however, that if a program has been approved by Vanderbilt, students must enroll in the program via the Global Education Office. In no case, after matriculating at Vanderbilt, may a student apply to participate in an approved program for transfer credit through a different university, or through an external agency, and then seek to transfer that credit into Vanderbilt.

Students enrolled full time (i.e., carrying at least 12 credit hours) during a regular (fall or spring) semester are assumed to be engaged in full-time study at Vanderbilt. Such students are not permitted to take additional course work elsewhere, for transfer credit, during the semester. This includes online courses, as well as courses offered by nearby institutions.

Declaration of Major and of Second Major

Peabody students declare a major as part of the application process prior to admission. In their first semester, Peabody freshmen are expected to take course work recommended for the major into which they were admitted. Students wishing to change into a different major within Peabody cannot declare this change until March of their first year, to take effect in fall of their second year. Second majors must be declared no later than the second semester of the sophomore year. Also during the sophomore year, students majoring in secondary education, special education, and human and organizational development will be required to declare their area of specialization or track.

Overlap in Course Work between Multiple Majors and Minors

Students pursuing multiple majors and/or optional minors are limited in the amount of course work that can be shared across their major and minor programs of study. If the major or minor is offered through a school other than Peabody, the amount of course work that can be shared between that major or minor and other majors or minors is determined by that school's policies. For a major offered through Peabody College, at least 21 credit hours need to be unique to that major. That is, 21 hours within the major cannot be used to count toward any other major or minor. For a minor offered through Peabody College, at least 15 hours need to be unique to that minor.

Senior Re-examination

A candidate for graduation who fails not more than one course in the final semester may be allowed one re-examination, provided the course failed prevents the student's graduation, and provided the student could pass the course by passing a re-examination. Certain courses may be excluded from reexamination.

The re-examination must be requested through the Office of the Associate Deans, and if approved, it is given immediately after the close of the last semester of the student's senior year. A student who passes the re-examination will receive

a D- in the course. The terms and administration of senior re-examination are the responsibility of the school that offers the course.

Grading System

Peabody College undergraduate students are on a four-point grading system. All work is graded by letters, interpreted as follows:

A:	excellent
B:	good
C:	satisfactory
D:	minimum pass work
F:	failure

Under certain circumstances the following grades may be awarded:

W:	withdrawal
P:	pass (see Pass/D/Fail course provision)
M:	missed final examination
I:	incomplete in some requirement other than final examination
MI:	missed final examination with additional incomplete requirements

Plus and minus modifiers may be associated with the letters A through D as shown in the table below. Grade point averages are calculated using indicated grade point values.

Defined Grades with Corresponding Grade Points per Credit Hour

A	= 4.0	C	= 2.0
A-	= 3.7	C-	= 1.7
B+	= 3.3	D+	= 1.3
B	= 3.0	D	= 1.0
B-	= 2.7	D-	= 0.7
C+	= 2.3	F	= 0.0

Grade Point Average

A student's grade point average is obtained by dividing the grade points earned by the hours for which the student has registered, excluding courses taken for no credit, those from which the student has withdrawn, and those that are completed with the grade P.

Audit

Regularly enrolled Peabody College students who want to audit courses in any of the undergraduate schools of the university must obtain the written consent of the instructor to attend the class but do not register for the course for credit. Forms are available from the Peabody Office of Academic Services, 211 Peabody Administration Building. No permanent record is kept of the audit. Regular students may audit one class each semester free of charge.

Pass/Fail

Students may elect to take some courses in which they can receive the grade P (Pass). This grade is entered for the student enrolled under the P/F option who is awarded a grade of D- or higher. The grade P is neither counted in the grade point average nor used in the determination of honors. A failing grade will appear on the student record as F and will be counted in the student's grade point average.

To be eligible for the P/F option, the student must have completed two regular semesters at Vanderbilt and must not be on academic probation. No more than one course per semester may be taken on a P/F basis and no more than three total during the undergraduate career. No more than one course from any Liberal Education Core area (e.g., communications, humanities) may be taken under this option.

Note that neither courses taken for transfer credit (grade of “T”) nor courses that are only offered on a pass/fail basis by the university (e.g., certain field experience courses) are counted against the number of courses that a student may voluntarily elect to take on a pass/fail basis, either within or across semesters.

The P/F option does not apply to courses in the following categories:

1. Liberal Education Core Courses that have been specifically identified by the student’s primary major as needing to be taken on a graded basis. By program, these courses are:

Human and Organizational Development: Courses taken to satisfy the 3-hour Liberal Core Economic requirement (i.e., Econ 1010, 1020, HOD 2260);

Child Development, Child Studies, and Cognitive Studies: Courses taken to satisfy the 3-hour Liberal Core Statistics requirement (i.e., Econ 1500, PSY-PC 2110, Psy 2100).

Special Education: PSY-PC 1250, PSY-PC 2600, EDUC 1220, SPED 1210, SPED 2120, SPED 2430, SPED 2160, SPED 3348.

Early Childhood Education: ENED 2430, EDUC 3750, ENED 2100, MTED 2100, PSY-PC 1250, SSED 2100.

Elementary Education: ENED 2430, EDUC 3750, 2200, MTED 2200, SCED 2200, PSY-PC 1250.

Secondary Education: PSY-PC 2550.

2. For students with a single or double major, courses in the department(s) of the major(s) or other courses that may be counted for the major(s);
3. For students with an interdisciplinary major, courses listed in the student’s plan of study;
4. For students planning an optional minor, courses in the department of the minor or those counting toward an interdisciplinary minor.

Students taking a course on a P/F basis must be enrolled for at least 12 hours on a regularly graded basis. If a student drops a course and falls below 12 graded hours, the P/F course is converted automatically to a regularly graded basis.

Seniors who meet the above criteria and have permission to take fewer than 12 hours on a graded basis may take one course on a P/F basis in one of their last two semesters (e.g., a semester in which an internship or student teaching is not being taken). If the student does not graduate at the end of the senior year, the grade of P is automatically converted to the grade actually earned.

All P/F students are expected to meet normal course requirements (e.g., reports, papers, examinations, laboratory attendance) and are graded in a normal way. At the end of the semester, students enrolled on a P/F basis are awarded a regular grade. Any grade of D- or better is converted in the Student Records System to a P, while an F grade remains as awarded. A student taking a course on a P/F basis must meet the course prerequisites as set forth in this catalog.

Students register for a course on a P/F basis on a Pass/Fail Declaration form available in 211 Peabody Administration Building during a registration appointment window or during open enrollment. After the first two weeks of classes, students may change from a P/F basis to a regularly graded basis—but not from a regularly graded basis to a P/F basis—until the end of the eighth week of classes. These deadlines are published in the calendar. When a student wishes to complete a major or minor in a field in which a grade of P has been received, the registrar converts this grade to the regular grade originally earned.

Credit Hour Definition

Credit hours are semester hours; e.g., a three-hour course carries credit of three semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements which exceed this definition. Certain courses (e.g., dissertation research, ensemble, performance instruction, and independent study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester will be included in the course description.

Temporary Grades

Temporary grades are placeholders that are assigned under defined circumstances with a specified deadline by which they will be replaced with a permanent grade. A student who receives a temporary grade is ineligible for the Dean’s List. Students may not graduate with temporary grades still remaining on their academic records.

I: Incomplete

An Incomplete is given only under extenuating circumstances and only when a significant body of satisfactory work has been completed in a course. The I is not intended as a replacement for a failing grade, nor should it be given to a student who misses the final examination. The M grade is used for the latter purpose. The request for an Incomplete is initiated by the student and must be approved by the instructor. In order to request an incomplete, the student must be in good academic standing (i.e., not be on academic probation). Unless they have advance approval of an academic associate dean, students on academic probation who receive an incomplete will have that grade revert to the default grade or, in its absence, an F. In assigning the grade of I, the instructor specifies (a) a default grade that counts the missing work as zero and (b) a deadline by which the missing work must be submitted. That deadline must be no later than the last class day of the next regular semester in residence. The Incomplete can be extended beyond the next semester only if the student’s associate dean determines that an extension is warranted. If the required work is submitted by the deadline for removing the Incomplete, the I will be replaced by the grade earned. If the work is not completed by the deadline, the default grade will become the permanent grade for the course.

The Incomplete is not calculated in the GPA, but a student who receives an Incomplete is ineligible for the Dean’s List.

M: Missing a Final Examination

The grade M is given to a student who misses a final examination, provided the student could pass the course if the final examination is successfully completed. The grade of F is given if the student could not pass the course even with the final examination.

It is the student’s responsibility to contact the Dean’s Office before the first day of the next semester, regardless of whether the student will be in residence that semester, to request permission to take a makeup examination. If a request has not been submitted by the proper time, or if the student fails to take the makeup examination within the prescribed time, the M grade will be replaced by an F.

MI: Missing a Final Examination and Other Work

The grade MI is assigned to a student who misses the final examination and whose work is incomplete in other respects. The MI may not be turned in without prior authorization by the dean. It is the student's responsibility to contact the Dean's Office to request permission to take a makeup examination and to arrange for submission of the missing work.

Withdrawal

The symbol W (withdrawal) is assigned in lieu of a grade when a student formally withdraws from a class before the published mid-semester deadline. After that point, withdrawal will result in an F. A student who withdraws from school for reasons such as illness, unusual personal or family problems, and the like, may petition the Dean's Office for an authorized administrative withdrawal. If approved, the student will receive the grade W for courses in progress. A student who withdraws from school without an authorized administrative withdrawal receives the grade W or F depending upon the date of withdrawal. The grade W is not included in the calculation of the grade point average.

Dead Week

Because Peabody classes integrate theory and practice, many courses include significant semester-long group and individual projects that culminate in papers, presentations, simulations, or other activities at the end of the semester. Therefore, while instructors are discouraged from scheduling quizzes, tests, or short-term assignments for the last week of the semester, Peabody's "dead week" policy does not prohibit assignments during the week before finals.

Repeat Courses

If a course is repeated, only the last grade and credit hours earned will be used to calculate the grade point average and be creditable toward graduation. However, the original grade will appear on the transcript. Certain courses (e.g., special topics courses, directed study courses; see duplicate content section, below) may be repeated for credit when there is no duplication of content. Such courses may be repeated to replace a grade only when the content of the original and repeated courses is the same. Courses must be repeated in a graded status. This policy also applies to Advanced Placement credit. Courses taken at Vanderbilt may not be repeated elsewhere for grade replacement, nor may courses taken elsewhere be repeated at Vanderbilt for grade replacement.

Duplication of Course Content

It is the responsibility of the individual student to avoid duplication in whole or in part of the content of any courses offered toward the degree. Such duplication may result in the withdrawal of credit. This policy also applies to Advanced Placement credit.

Certain courses (e.g., ensemble, performance instruction, special topics, and directed study) are designated as repeatable as they contain evolving or iteratively new content. These courses may be taken multiple times for credit. If a course can be repeated, the number of credits allowable per semester should not exceed 3 credit hours without permission.

Normal Course Load

Each semester, regular tuition is charged on the basis of a normal course load of 12 to 18 semester hours. No more than 18 or

fewer than 12 hours may be taken in any one semester without authorization from the dean of Peabody Student Affairs. There is an extra charge for more than 18 hours at the current hourly rate (contact Student Accounts). Students permitted to take fewer than 12 hours are either placed on academic probation or issued an academic warning, unless their light load is necessary because of health, family or outside employment. The one exception to this policy is that seniors who have fewer than 12 hours required for the completion of their degree, beyond the hours associated with the HOD internship or student teaching if they are to be taken in the final semester, can take fewer than 12 hours in one of their last two semesters (e.g., a semester in which an internship or student teaching is not being taken) without penalty or requiring special permission.

Class Standing

To qualify for sophomore standing, a freshman must earn at least 24 hours with a grade point average of at least 1.800 and have completed two regular semesters. A freshman who fails to achieve sophomore standing at the end of two regular semesters is placed on probation and has one additional semester in which to qualify for sophomore standing. This additional semester must be the summer session at Vanderbilt. Normally, students who fail to qualify for sophomore standing in the third semester are dropped from the university.

A student qualifies for junior standing by earning 54 hours with a grade point average of at least 1.900 and having completed four regular semesters. Students who fail to qualify for junior standing at the end of two semesters after qualifying for sophomore standing are placed on probation and must qualify in an additional semester. This third semester must be the summer session at Vanderbilt. Normally, students who do not qualify for junior standing in this additional semester will be dropped from the university.

A student qualifies for senior standing by earning 84 hours with a grade point average of at least 2.000 and having completed six regular semesters. A student who fails to qualify for senior standing within two semesters of qualifying for junior standing will be placed on probation and must qualify in one additional semester. This additional semester must be the summer session at Vanderbilt. Normally, students who do not qualify for senior standing in this additional semester will be dropped from the university.

Alternate Track

Occasionally students find that it will be necessary to reduce their normal load due to medical reasons, varsity athletics, or other circumstances. The result is that they will accomplish the bachelor of science degree in nine or ten semesters instead of eight. In such cases, the student may request Alternate Track status. After discussing this option with their parents and faculty adviser, students petition the dean for permission. This normally takes place during the sophomore year. Additional information is available in the Office of Peabody Student Affairs.

Progress Evaluation

Students enrolled in Peabody College are expected to satisfy most Liberal Education Core requirements during the freshman and sophomore years. Although legitimate circumstances sometimes force the postponement of Liberal Education Core requirements, upper-level students are not expected to have a significant number of Liberal Education Core requirements outstanding. A student who, in the opinion of the faculty

adviser, the department chair, or the dean, is not making satisfactory progress toward meeting Liberal Education Core or other degree requirements may be reported to the Undergraduate Administrative Committee and is subject to being placed on academic probation by that committee. Students placed on academic probation for failure to make satisfactory progress toward a degree must remove the deficiency in the manner specified by the Administrative Committee.

Academic Probation and Dismissal

After achieving sophomore standing, the student may not be on academic probation for more than two semesters. A student whose academic record warrants a third semester of probation normally will be dropped from the university. Students will be placed on academic probation, or may receive an academic warning, if any of the following conditions apply:

Freshmen

1. The student's cumulative grade point average falls below 1.800. Probation is removed (assuming there is no other reason for the probation) when the student's grade point average is raised to 1.800 or above.
2. The student fails to earn at least 12 hours in a regular semester as a freshman. Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress.
3. The student fails to achieve sophomore standing in the required two semesters. Probation is removed when the student achieves sophomore standing.
4. Freshmen who pass fewer than two regular courses in their first regular semester or who earn a grade point average lower than 1.000 have so seriously compromised their academic standing that they may be required to take an academic probationary leave of absence during the spring semester.

Sophomores

1. The student's cumulative grade point average falls below 1.800. Probation is removed (assuming there is no other reason for the probation) when the student's grade point average is raised to 1.800 or above, except that at the end of the second regular semester the student must qualify for junior standing.
2. The student fails to earn at least 12 hours in a regular semester as a sophomore. Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress.
3. The student is placed on probation by the Undergraduate Administrative Committee for failure to make satisfactory progress toward the degree. Probation is removed when the specified conditions are met.
4. The student fails to achieve junior standing in the required two semesters after achieving sophomore standing. Probation is removed when junior standing is achieved.

Juniors

1. The student's cumulative grade point average falls below 1.900. Probation is removed (assuming there is no other reason for the probation) when the grade point average is raised to 1.900 or above, except that at the end of the second regular semester the student must qualify for senior standing.
2. The student fails to earn at least 12 hours in a regular semester as a junior. Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress.
3. The student is placed on probation by the Undergraduate Administrative Committee for failure to make satisfactory progress toward the degree. Probation is removed when the specified conditions are met.
4. The student fails to achieve senior standing in the required two semesters after achieving junior standing. Probation is removed when senior standing is achieved.

Seniors

1. The student's cumulative grade point average falls below 2.000. Probation is removed when the grade point average is raised to 2.000 or above.
2. The student fails to earn at least 12 hours in a regular semester as a senior, unless the semester is one in which the student needs fewer than 12 hours in order to complete the requirements for graduation (see section on Course Load, above). Probation is removed when the student earns at least 12 hours in a subsequent semester and/or is judged to be making satisfactory academic progress and/or completes the requirements for graduation.

Sudden Academic Insufficiency

Any student who fails by a wide margin to reach prescribed levels of academic achievement, either at the end of a semester or at mid-semester, or who has been placed on probation more than once is reviewed by the Peabody Undergraduate Administrative Committee. The Committee considers each case within the general guidelines for maintenance of satisfactory academic standing and may take any of several actions, among which are the following:

- The student may be placed on probation or be issued an academic warning;
- The student may be advised to take a leave of absence or to withdraw from the university;
- The student may be required to take an academic probationary leave of absence.
- The student may be dismissed from the university.

Under certain circumstances, a student who has been formally dismissed may be readmitted to Peabody. The Peabody Undergraduate Administrative Committee must review and approve any request for readmission.

Appeal and Petition Process for Undergraduate Academic Matters

The procedures of the appeal process pertaining to academic matters within Peabody College are listed below. Please see the chapter "Student Accountability" in the Vanderbilt University

Student Handbook for a description of the appeal process for non-academic matters.

Petitions for exceptions to academic policies, appeals of academic policy implementations by Peabody Dean's Office staff, and appeals of academic actions by the Undergraduate Administrative Committee (UAC) Chair (e.g., letters of dismissal) may be directed to the full UAC.

Petitions and appeals should be sent to:

Chair, Peabody Undergraduate Administrative Committee
c/o Peabody Dean's Office
202 Peabody Administration Building
PMB 0329
230 Appleton Place
Nashville, TN 37203-5721
Fax: (615) 322-8501

A student may ask the UAC to reconsider a decision if the student has new information to offer. The chair of the UAC will decide whether the full UAC will reconsider. Requests for reconsideration of UAC decisions should be sent to the above address.

A final, negative decision of the UAC may be appealed to the dean of Peabody College (at the above address), who may assign an associate dean to handle the matter on the dean's behalf. The dean or associate dean will consult with the UAC and other relevant faculty or staff as part of the review of the decision.

Further appeals beyond Peabody College should be directed to the Provost's Office.

Grade Appeals

A student who believes they have received an inappropriate final grade in a class can appeal that grade if they believe the grade is inappropriate for at least one of the following reasons:

1. The student is held to different standards than other students in the course.
2. The instructor in determining the final grade applied standards that departed from those outlined in the course syllabus.
3. The student believes that there is a clerical error in the calculation or reporting of the grade.
4. The instructor did not adequately consider the student's needs for officially sanctioned and communicated accommodations.

Ultimately, the grade can be appealed following the academic appeals process outlined for more general academic matters, directly above. However, several steps to attempt to resolve the grade should be taken, in turn, before an appeal is submitted to the Undergraduate Administrative Committee (UAC).

First, students and instructors are encouraged to resolve grade disputes informally. If an informal process fails, the student may formally appeal a final course grade by contacting the instructor in writing within ten (10) business days after the start of the following semester. The student's written appeal must include the grounds for the appeal (see conditions 1 through 4 listed above), the change in grade that is being requested, and evidence to support the student's case for a grade change. The instructor must inform the student of his/her decision in writing.

Second, if the student does not feel the matter has been resolved satisfactorily with the instructor, the student may petition the director of undergraduate studies in the department where the course is housed. The petition for reviewing the appeal must include the original written appeal, the instructor's written response, and the reason why the student is dissatisfied with

the instructor's decision. The DUS will review the materials and assess the merits of the case. If the DUS finds no basis for the grievance, the petition will be dismissed and the student will be notified in writing. If the DUS determines that the grievance has merit, the DUS will work with the parties to seek a resolution. If the DUS is the course instructor, the student may directly petition the department chair in which the course is housed.

Third, if the case is dismissed by the DUS, and the student does not agree with the grounds for the decision, the student may petition the chair of the department where the course is housed. The student is responsible for providing the department chair with relevant case documentation, including the original written appeal, the written responses of both the instructor and the DUS, and an explanation as to why the student is dissatisfied with the DUS's decision to dismiss the case. The department chair will decide the merits of the case and provide written documentation to all parties as to the decision. If the case is determined to have merit, the department chair will seek a resolution among the parties involved, including the student, the instructor, and the DUS. If the department chair is the course instructor, the student may appeal the DUS's decision directly to the Undergraduate Administrative Committee using the more general academic appeals process outlined in the previous Appeals section.

Fourth, if the case is dismissed by the department chair and the student does not agree with the grounds for the decision, the student may appeal the department chair's decision to the Undergraduate Administrative Committee using the more general academic appeals process outlined in the previous Appeals section.

Student Leave of Absence

A student desiring a leave of absence should obtain the appropriate forms from the Office of Undergraduate Student Affairs. All students are eligible, provided they have not been dropped by the university and are not dropped at the end of the semester during which application is made.

Leaves are granted for one or two semesters. Applications should be completed before the end of the fall semester for a leave of absence during the spring semester and before 15 August for a leave of absence during the fall semester (or for the academic year). If the leave is approved, the student must keep the Dean's Office informed of any change of address while on leave.

Should a student seek to transfer to Vanderbilt credit earned elsewhere while on a leave of absence, it is mandatory that permission be obtained in advance from the Dean's Office. Petitions for leaves of this type must be filed at least one month before the close of the preceding semester.

While the student is on leave, registration information will be emailed to his or her Vanderbilt email address. A student failing to register at the conclusion of the stated leave will be withdrawn from the university and must apply for readmission.

Students who wish to participate in a non-Vanderbilt program in the United States, abroad, or at sea should apply for a leave of absence for the relevant semester. To qualify for such a leave, a student must be in good standing at Vanderbilt with at least a 2.700 grade point average as of the date of application. Students must obtain prior approval for the leave of absence and for the credits to be taken in other programs if the credits are to be transferred to Vanderbilt. Final approval of leaves of absence always rests with the Dean's Office. See the section on Transfer Credit in this chapter.

Withdrawal from the University

Students proposing to withdraw from the university during any semester must report to the Peabody Office of Undergraduate Student Affairs to initiate proper clearance procedures. Students are graded on the same basis as if withdrawing from a course. Students who withdraw before the end of the eighth week of classes receive a partial refund of tuition (see the section on Financial Information). Students intending to withdraw from the university for the following semester should notify the Peabody Office of Undergraduate Student Affairs by 1 December for spring semester or by 1 May for the fall semester.

Students who have withdrawn from the university without filing a Leave of Absence form must apply for readmission if they wish to return.

Graduation

Degree candidates must have completed satisfactorily all curriculum requirements, have passed all prescribed examinations, and be free of indebtedness to the university. Graduation requirements vary with the student's program of study but include a minimum of 120 hours (at least 60 of which must have been earned at Vanderbilt) and a minimum cumulative grade point average of 2.000. A degree candidate must also have a 2.0 cumulative grade point average in his or her major.

Commencement. The university holds its annual Commencement ceremony following the spring semester. A student completing degree requirements will be officially graduated, however, at the close of the semester or summer session in which the degree is earned, with such graduation recorded on the student's permanent record. Students who graduate at the close of the summer session or the fall semester preceding the spring commencement ceremony are encouraged to join spring graduates in the graduation ceremony in May. Those unable to do so may receive their diplomas by mail.

Special Program

Peabody Scholars Program

First-year students who achieve academic distinction during their first semester at Vanderbilt are invited to apply to the Peabody Scholars Program. The Peabody Scholars Honors Program was established to offer particularly promising undergraduates at Peabody College opportunities for holistic flourishing through intellectual adventure, community service, and research.

Emphasizing a theme of personal, professional, and civic creativity, the program is designed to foster full blooming of students' potential by offering breadth through exposing students to a variety of academic and social experiences in different domains and depth by engaging in service-learning and independent research.

To graduate with honors through Peabody Scholars, scholars need to earn 24 points within the program. Scholars earn points from a series of required components as well as optional enrichment programming. All freshman Peabody Scholars participate in a 3-credit-hour seminar on creativity during the spring semester. In the sophomore year, scholars work together on a meaningful immersive service project in the local community. Each Peabody Scholar is offered a summer stipend (between sophomore and junior years) to support engagement in an individual service-learning project (either domestic or abroad). In the junior year, scholars engage in independent research projects with a Peabody professor. Senior scholars participate in monthly scholarly and cultural events and have the opportunity to work on capstone projects related to their fields of study. The Peabody Scholars Program also offers professional development, networking, mentoring, and more. The full list of current programming is available on the program website. In sum, the Peabody Scholars Program offers a rich array of enrichment experiences and opportunities.

Peabody freshmen may apply for the Peabody Scholars Program in the fall of their first semester at Vanderbilt. Selections will be made prior to the beginning of the spring semester. To be accepted into the program, students must have a first-semester GPA of 3.6. To remain in good standing in the program, students must maintain a minimum grade point average of 3.0. Further information on the Peabody Scholars Program may be obtained from Professor Leslie Kirby in the Department of Human and Organizational Development.

Interdisciplinary Majors

PEABODY College, in conjunction with the College of Arts and Science, offers four interdisciplinary majors. These majors are to be taken as second majors only and are constructed around academic disciplines particularly appropriate for future teachers (except secondary), but are not limited to students entering teacher education. The interdisciplinary major consists of 36 hours of study and draws upon the academic resources of a number of departments throughout the University. Students follow the Liberal Education Core requirements of their first major.

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Language and Literacy Studies (36 hours)

COMMUNICATIONS.

6 hours from:

CMST 1500, Fundamentals of Public Speaking; CMST 1850 Interpersonal Communications

ENGLISH.

9 hours from:

ENGL1230W, 1270W or 1260W and 1250W and 3210 and above

EDUCATION.

9 hours from:

ENED 2100, 2200 or 4963 (3 hours); ENED 2430, ENED 3310 (3 hours); SPED 2430 or PSY-PC 3150 (3 hours)

ADDITIONAL COURSES

12 hours from two areas:

ANTH 1601, Introduction to Language and Culture; ANTH 2601, Introduction to Linguistics; ANTH 2602, Anthropological Linguistics; ANTH 2603 Comparative Writing Systems; CMST 2800, Rhetoric of Civic Life; CMST 3000, Rhetoric of American Experience, 1640-1865; CMST 3001, Rhetoric of American Experience, 1865-1945; CMST 2900, Values of Modern Communication; CMST 3002, Rhetoric of the American Experience 1945-Present; CMST 2950, Rhetoric of Mass Media; PHIL1003, General Logic; PSCI 2242, Political Communication; THTR 1010, Fundamentals of Theatre

Mathematics and Science Studies (35–37 hours)

BIOLOGICAL SCIENCES.

4 hours from:

BSCI 1100 and 1100L, Biology Today; BSCI 1105, Human Biology; BSCI 1510 and 1510L, or BSCI 1511 and 1511L, Introduction to Biological Sciences; BSCI 1103, Green Earth, the Biodiversity and Evolution of Green Plants

CHEMISTRY.

4 hours from:

CHEM1010L and 1010, or CHEM 1020L and 1020, Introductory Chemistry; CHEM 1601 and 1601L, or CHEM 1602 and 1602L, General Chemistry

PHYSICS.

4 hours from:

PHYS 1010 and 1010L, Introductory Physics; PHYS 1601 and 1601L or 1602 and 1602L, General Physics

EARTH AND SPACE SCIENCES.

3-4 hours from:

ASTR 1010 and 1010L, Introductory Astronomy: Stars and Galaxies; EES 1510 and 1510L, The Dynamic Earth; EES 1030 and 1030L, Oceanography; EES 1080, Earth and Atmosphere; EES 1140, Ecology, Evolution, and Climate through Time

HISTORY/ PHILOSOPHY OF SCIENCE.

3 hours from:

ASTR 2130, Theories of the Universe; HIST 2800, Modern Medicine; PHIL 3616, Philosophy and the Natural Sciences

CALCULUS.

8-9 hours from:

MATH 1200, 1201, and 2200, Single-Variable Calculus I, II, and III; MATH 1300 and 1301, Accelerated Single-Variable Calculus I and II

PROBABILITY AND STATISTICS.

3 hours from:

MATH 2820 Introduction to Probability and Mathematics Statistics; MATH 3700, Discrete Mathematics; PSY-PC 2110 Introduction to Statistical Analysis

GEOMETRY.

3 hours from:

MATH 3200, Introduction to Topology; MATH 3210, Transformation Geometry; MATH 3310, Introduction to Mathematical Logic

ALGEBRA

3 hours from:

MATH 2410, Methods of Linear Algebra; MATH 2600, Linear Algebra; MATH 3300, Abstract Algebra

Natural Science Studies (35–36 hours)

BIOLOGICAL SCIENCES.

8 hours from:

BSCI 1100/1100L, Biology Today; BSCI 1105, Human Biology; BSCI 1510 and 1510L, and/or 1151 and 1151L, Introduction to Biological Sciences; BSCI 1103, Green Earth, the Biodiversity and Evolution of Green Plants

CHEMISTRY.

8 hours from:

CHEM 1010L and 1010 and/or 1020L/1020, Introductory Chemistry; CHEM 1601 and 1601L and/or 1602 and 1602L, General Chemistry

PHYSICS.

4 hours from:

PHYS 1010 and 1010L, Introductory Physics; PHYS 1601/1601L or 1602 and 1602L, General Physics

EARTH AND SPACE SCIENCES.

3-4 hours from:

ASTR 1010/1010L Introductory Astronomy: Stars and Galaxies; EES 1510 and 1510L, The Dynamic Earth; EES 1030 and 1030L, Oceanography; EES 1080 Earth and Atmosphere; EES 1140, Ecology, Evolution, and Climate through Time

HISTORY/ PHILOSOPHY OF SCIENCE.

3 hours from:

ASTR 2130, Theories of the Universe; HIST 2800, Modern Medicine; PHIL 3613, Philosophy and the Natural Sciences

ELECTIVES.

9 hours (3 additional courses) in:

Astronomy, Biological Sciences, Chemistry, Earth and Environmental Sciences, Physics, or History and Philosophy

Second Language Studies (36 hours)

EDUCATION.

9 hours from:

EDUC 3730, ELL Educational Foundations; EDUC 3750, Linguistics and Language Acquisition for ELL Teachers; ENGL 1260W, Introduction to Literary and Cultural Analysis

PSYCHOLOGY.

3 hours from:

PSY-PC 1250, Developmental Psychology; PSY-PC 2600, Educational Psychology

LINGUISTICS.

3 hours from:

ANTH 1101, Introduction to Linguistics; ENED 2430, Fostering Language in Diverse Classrooms; SPED 2430, Introduction to Language and Communication

FOREIGN LANGUAGE.

12 hours of language courses from:

Arabic, Chinese, French, German, Hebrew, Italian, Japanese, Portuguese, Russian, or Spanish

ELECTIVES.

9 hours of elective courses are to be selected to reflect a concentration within a specific foreign language. Students MUST consult with their advisers when selecting elective hours.

For elementary or early childhood majors seeking an added endorsement in ELL, in addition to the above major requirements, the following 9 hours are required: EDUC 3740, ELL Methods and Materials (3 hours); EDUC 3760, Assessment of ELL (3 hours); EDUC 3731, 3742, and 3763, Practicum for ELL (3 hours)

Social Studies (36 hours)

Students selecting an interdisciplinary major in social studies will have seven options available to them. Each option requires 18 hours of study focused on a single social science discipline that is supplemented with 18 hours of course work drawn from studies within other social sciences. The seven options available to students include a focus on any of the following areas of study: Anthropology, Economics, American History, European History, American Politics, World Politics, or Sociology.

Anthropology

9 hours from:

ANTH 1101, Introduction to Anthropology; ANTH 1201 Introduction to Archaeology; ANTH 1301, Introduction to Biological Anthropology

9 hours in specified courses:

A Comparative Anthropology and Anthropological Theory Course (3 hours)

An Archaeology and Physical Anthropology Course (3 hours)

An Ethnography, Ethnohistory, and Linguistics Course (3 hours)

Six courses (18 hours) drawn from at least three areas: Economics, History, Political Science, and Sociology

Economics

9 hours required from:

ECON 1010, Principles of Macroeconomics; ECON 1020, Principles of Microeconomics; ECON1500, Economic Statistics

Additional 9 hours in Economics Courses

Six courses (18 hours) drawn from at least three areas: Anthropology, History, Political Science, and Sociology

United States History

6 hours from:

HIST 1390, America to 1776; HIST 1400, U.S. 1776-1877; HIST 1410, U.S. 1877-1945; HIST 1420, U.S. Post-1945

Additional four courses (12 hours) of United States History courses from: HIST 1390-1440, 1660, 1690, 1720, 1730, 2580, 2590, 2610-2650, 2690-2722

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, Political Science, and Sociology

European History

6 hours from:

HIST 1350, History of Western Civilization to 1700; HIST 1360, History of Western Civilization since 1700

Additional four courses on European History from:

HIST 1600, 2130 2135, 2220-2410

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, Political Science, and Sociology

American Politics

3 hours from:

PSCI 1100, Intro. to American Government and Politics

Any five (15 hours) of the following PSCI courses: 2204, 2222, 2240-2246, 2248, 2251, 2255, 2256, 2259, 2262, 3247, 3249, 3250, 3252-3254, 3258, 3260, 4275

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, History, and Sociology

World Politics

3 hours from:

PSCI 1101, Introduction to Comparative Politics; PSCI 1102, Introduction to International Politics

Any five (15 hours) of the following PSCI courses: 2210, 2212-2216, 2218-2227, 2230-2234, 2236, 3211, 3217, 3228, 3229, 3235

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, History, Sociology

Sociology

6 hours from:

SOC 1010, Introduction to Sociology, or SOC 1020, Contemporary Social Problems (3 hours); SOC 3001, Sociological Perspectives (3 hours)

4 courses (12 hours) 3 hours from each of the following areas:

A sociology course drawn from the core area of Crime, Law, and Deviance

A sociology course drawn from the core area of Organizations, Politics, and Inequality

A sociology course drawn from the core area of Family, Medicine, and Mental Health

A sociology course drawn from the core area of Culture and Social Change

Six courses (18 hours) drawn from at least three areas: Anthropology, Economics, History, and Political Science

Majors in Child Development, Child Studies, and Cognitive Studies

CHAIR, DEPARTMENT OF PSYCHOLOGY AND HUMAN DEVELOPMENT

Bethany Rittle-Johnson

DIRECTOR OF UNDERGRADUATE STUDIES Leigh Wadsworth

PPROFESSORS EMERITI Leonard Bickman, Penelope H. Brooks,

David S. Cordray, Carl Haywood, Robert B. Innes, James H. Hogge,

Kathleen V. Hoover-Dempsey, John Rieser, Howard M. Sandler,

James H. Steiger

PROFESSORS Amy Booth, James Booth, David Cole, Bruce Compas,

Elizabeth Dykens, Judy Garber, Daniel Levin, David Lubinski, Amy

Needham, Kristopher Preacher, Bethany Rittle-Johnson, Joseph

Rodgers III, Tedra Walden, Bahr Weiss

ASSOCIATE PROFESSORS Sarah Brown-Schmidt, Sun-Joo Cho, Laura

Novick, Megan Saylor, Craig Smith, Sonya Sterba, Georgene Troseth,

Duane Watson, Hao Wu

ASSOCIATE CLINICAL PROFESSORS F. Joseph McLaughlin III, Nina

Martin

ASSISTANT PROFESSORS Lisa Fazio, Kathryn Humphreys, Autumn

Kujawa, Jonathan Lane, Gavin Price

ASSISTANT CLINICAL PROFESSOR Vicki Harris

PRINCIPAL SENIOR LECTURER Leigh Wadsworth

SENIOR LECTURERS Shane Hutton, Julia Noland

LECTURERS Jenni Dunbar, Maria Osina

Major in Child Development

THE child development major is designed for students who wish to study children (infancy through adolescence) and the family, cultural, peer, school, and neighborhood contexts in which they live. The major is designed to provide a strong background in the social and behavioral sciences related to child development, a focused understanding of the scientific study of children and the contexts in which they develop, and opportunities for supervised and independent research on aspects of child development in ways that enable students to link theories and prior research to research design and data on children's development. The major is excellent preparation for graduate study in selected social science and professional fields (e.g., psychology, medicine, nursing, education, public policy) and offers an excellent complementary (or second) major for undergraduate students simultaneously pursuing a major in cognitive studies, elementary education, human and organizational development, or special education.

The child development curriculum is designed to ensure that students develop a background in the liberal arts and sciences; a clear understanding of the theories, major research findings, and research methods central to the field of child development; and an area of focus or expertise in child development. Development of background in the liberal arts and sciences occurs within the context of the Liberal Education Core, composed of required and elective courses in communications, humanities, mathematics, natural sciences, and social sciences. A clear understanding of theory and research central to the field is developed through the major core courses. These include an overview of child development, courses focused on the domains of psychological processes central to human development (cognition; social and personality development), courses related to major epochs of child development (infancy and adolescence), and courses devoted to the major research methodologies in the field (experimental, observational, psychometric). Students select an area of concentration (major elective area) to complement the field as a whole.

Honors Program

The Honors Program in child development offers qualified majors the opportunity to conduct individual research projects in collaboration with faculty members. This research experience culminates in the writing and public presentation of a senior thesis. Students who major in child development are eligible to apply for the Honors Program at the end of their sophomore year if they have an overall grade point average of at least 3.2 and at least a 3.2 in child development courses.

Students who complete the program successfully and who have a final grade point average of at least 3.2 will receive Honors or Highest Honors in child development. The program should substantially aid those intending to do graduate work. More specific information concerning admission to and the requirements of the Honors Program is available from the director of the Honors Program, the director of undergraduate studies, or the department education coordinator.

Curriculum

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 40 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Major Requirements. 30 hours.

Students take a minimum of 30 hours in child development. The core consists of seven courses (21 hours) in developmental areas, epochs, and methods, and a minimum of three additional courses (9 hours) in an elective area of specialization.

Major Core. 21 hours.

PSY-PC 1250. Developmental Psychology
 PSY-PC 2250. Cognitive Aspects of Human Development
 PSY-PC 2400. Social and Personality Development
 PSY-PC 2120. Statistical Analysis

One of the following two courses:

PSY-PC 2500. Infancy
 PSY-PC 2550. Adolescent Development

Two of the following courses:

PSY-PC 2170. Experimental Methods, or
 Psy 2150. Principles of Experimental Design
 PSY-PC 3722. Psychometric Methods
 PSY-PC 3860, 3980, 3981, 4998, 4999; Psy 3840, 3980, 4998, 4999.
 Directed Research or Honors Research (Only 3 hours of either Directed
 Research or Honors Research can be applied to this requirement.)

Major Elective Area. A minimum of 9 hours.

Any course in the Department of Psychology and Human Development (Peabody) or the Department of Psychology (A&S) that is not being used to meet another psychology requirement can be used as an elective (except, Psy 1200, Psy 2100, PSY-PC 1205/1207, 2110, 3870).

Additionally, the following courses may serve as electives. With the approval of the adviser, program director, or director of undergraduate studies, other courses may also be used as part of the child development elective area.

Education 3120. Children in Families and Schools
 Education 3140. Learning and Development in Early Childhood Education
 English Education 2430. Fostering Language in Classrooms
 English Education 2100. Literature and Drama for Young Children
 English Education 2200. Exploring Literature for Children
 HODC 3232. Ethics for Human Development Professionals
 HODC 3342. Introduction to Community Psychology
 Neuroscience 2201. Neuroscience
 Neuroscience 3269. Developmental Neuroscience
 Philosophy 3617. Philosophy of Language
 PSY-PC 3850.* Independent Study
 PSY-PC 3860.* Directed Research
 PSY-PC 3980 or Psychology 3980, 3981, 4998, 4999* Honors Research
 SPED 2120. Family Interventions
 SPED 2160. Cultural Diversity in American Education
 SPEDH 3348. Language and Learning
 SPEDS 2430. Introduction to Language and Communication

NOTE: Research/experiential courses marked * above may be repeated freely for elective credit toward graduation. However, only a total of 6 hours from among these courses, in any combination, may be used as elective credit within the major.

Second Major or Electives. 50 hours (or less if additional hours are earned in the Liberal Education Core, Major Core, or Major Elective Area).

Major in Child Studies

PEABODY has long had great strength in the area of child studies. The 36-hour interdisciplinary major in child studies draws on courses from psychology, education, special education, and human and organizational development. The major is excellent pre-professional preparation for students interested in graduate school in psychology or education, in law (e.g., child and family advocacy), or in various health related areas (e.g., medicine, nursing) involving children. It is also appropriate for students who are interested in gaining a broader understanding of children and families in contemporary society. The major areas covered are: developmental psychology; learning; research methods; language and literacy; and families, community, and diversity.

Honors Program

The Honors Program in child studies offers qualified majors the opportunity to conduct individual research projects in collaboration with faculty members. This research experience culminates in the writing and public presentation of a senior thesis. Students who major in child studies are eligible to apply for the Honors Program at the end of their sophomore year if they have an overall grade point average of at least 3.2 and a 3.2 in child studies courses. Students who complete the program successfully and who have a final grade point average of at least 3.2 will receive Honors or Highest Honors in child studies. The program should substantially aid those intending to do graduate work. More specific information concerning admission to and the requirements of the Honors Program is available from the director of the Honors Program, the director of undergraduate studies, or the department education coordinator.

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NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Child Studies Major Courses

DEVELOPMENT COURSES. (9 hours)

- PSY-PC 1250. Developmental Psychology
 PSY-PC 2250. Cognitive Aspects of Human Development
 PSY-PC 2400. Social and Personality Development
 PSY-PC 2500. Infancy
 PSY-PC 2550. Adolescent Development

LEARNING. (3 hours)

- Mathematics Education 2100 or 2200
 Science Education 2200 or Social Studies Education 2100
 PSY-PC 2600. Educational Psychology
 SPED 2310. Managing Academic and Social Behavior

RESEARCH METHODS. (3 hours)

- PSY-PC 2170. Experimental Methods, or
 Psy 2150. Principles of Experimental Design
 PSY-PC 3722. Psychometric Methods
 PSY-PC 3724. Psychometrics
 HOD 2500. Systematic Inquiry

FAMILIES, COMMUNITY, AND DIVERSITY. (6 hours)

- EDUC 1220. Society, School, and the Teacher
 EDUC/SPED 2160. Cultural Diversity in American Education
 EDUC 3120. Children in Families and Schools
 EDUC 3620. Social and Philosophical Aspects of Education
 HODH 3221. Health Service Delivery to Diverse Populations
 HODC 3202. Social Problems I
 HODC 3342. Introduction to Community Psychology
 SPED 1210. Introduction to Exceptionality
 SPED 2120. Family Intervention

LANGUAGE AND LITERACY. (6 hours)

- ANTH 2601. Introduction to Linguistics
 EDUC 3114. Language and Literacy Learning in Young Children
 EDUC 3214. Theory and Method of Reading Instruction in Elementary Schools
 ENED 2430. Fostering Language in Classrooms
 ENED 2100. Literature and Drama for Young Children
 ENED 2200. Exploring Literature for Children
 Philosophy 3617. Philosophy of Language
 PSY-PC 3150. Language Development
 SPEDS 2430. Introduction to Language and Communication
 SPEDH 3348. Language and Learning

ELECTIVES IN CHILD STUDIES. (9 hours)

Any course in the Department of Psychology and Human Development (Peabody) or the Department of Psychology (A&S) that is not being used to meet another psychology requirement can be used as an elective (except PSY 1200, Psy 2100, PSY-PC 1205/1207, 2110, and 3870).

Additionally, the following courses may serve as electives. With the approval of the adviser, program director, or director of undergraduate studies, other courses may also be used as part of the child studies elective area.

- PSY-PC 3850.* Independent Study
 PSY-PC 3860.* Readings and Research for Undergraduates
 PSY-PC 3980, 3981, 4998, 4999, or Psy 3980, 3981, 4998, 4999.*
 Honors Research
 HOD 3232. Ethics for Human Development Professionals
 HODC 3202. Community Development Theory

NOTE: Research/experiential courses marked * above may be repeated freely for elective credit toward graduation. However, only a total of 6 hours from among these courses, in any combination, may be used as elective credit within the major.

Major in Cognitive Studies

THE cognitive studies major is designed for students who wish to become active inquirers into the processes by which people learn to think, solve problems, and reason. The major encourages the development of flexible reasoning and problem-solving skills that are useful in a wide variety of endeavors. The major is excellent preparation for graduate study in the social and behavioral sciences as well as for areas (such as medicine and law) that place importance on inquiry and clear thinking.

The curriculum is planned to ensure that students receive a strong background in both science and the liberal arts, with an emphasis on problem solving and complex decision making. The courses in the core curriculum focus on various aspects of human cognition, including communication, cognitive development, basic cognitive processes, applications of theories of knowledge, and sociocultural aspects of learning. Students are encouraged to consult their advisers about pursuing a second major or developing an area of concentration that is consistent with their career plans. The major also emphasizes an appreciation of the scientific method and the research process; numerous opportunities exist to pursue independent study in close collaboration with faculty members.

Leadership and success in our society will depend increasingly on one's ability to process complex information, solve difficult problems using systematic analysis, and facilitate the learning of others. The knowledge and experience gained by students in cognitive studies will allow them to be full participants in the society of learners who represent the future.

Honors Program

The Honors Program in cognitive studies offers qualified majors the opportunity to conduct individual research projects in collaboration with faculty members. This research experience culminates in the writing and public presentation of a senior thesis. Students who major in cognitive studies are eligible to apply for the Honors Program at the end of their sophomore year if they have an overall grade point average of at least 3.2 and a 3.2 in cognitive studies courses. Students who complete the program successfully and who have a final grade point average of at least 3.2 will receive Honors or Highest Honors in cognitive studies. The program should substantially aid those intending to do graduate work. More specific information concerning admission to and the requirements of the Honors Program is available from the director of the Honors Program, the director of undergraduate studies, or the department education coordinator.

Curriculum

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 40 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Major Requirements. 33 hours.

Students take a minimum of 33 hours in Cognitive Studies. The core consists of four courses (12 hours), a minimum five additional courses (15 hours) in the elective area, and two courses (6 hours) in the Methods of Inquiry area.

Major Core. 12 hours.

PSY-PC 1205. Minds, Brains, Contexts, and Cultures
or 1207.
PSY-PC 2200. Psychology of Thinking
or Psy 3120. Cognitive Psychology
PSY-PC 3650. Advanced Topical Seminar
One of the following:
PSY-PC 2170. Experimental Methods or
Psy 2150. Principles of Experimental Design

Methods of Inquiry. 6 hours.

May also be used to satisfy Liberal Education Core requirements

ANTH 1301, 2211
CHEM 2100
CS 1101 or 2212
EES 3250
HOD 2500
HODC 3222
Philosophy 1003, 3003, 3616
PSY-PC 2120, 3722, 3724
PSY-PC or Psy 3980, 3981, 4998, 4999 (Only 3 hours from any of these courses can be applied to this requirement)
SOC 3002
SPED 2310
SPEDH 3871/SPEDS 3871

Major Elective Area. 15 hours

Any course in the Department of Psychology and Human Development (Peabody) or the Department of Psychology (A&S) that is not being used to meet another psychology requirement can be used as an elective (except PSY-PC 1250, 2110, 3870, Psy 1200, Psy 2100).

Additionally, the following courses may serve as electives. With the approval of the adviser, program director, or director of undergraduate studies, other courses may also be used as part of the cognitive studies elective area.

ANTH 1301. Biological Anthropology
ANTH 2601. Introduction to Linguistics
ENED 2430. Fostering Language in Classrooms
NSC 2201. Neuroscience
PHIL 3617. Philosophy of Language
PHIL 3630. Philosophy of Mind
PSY-PC 3850.* Independent Study
PSY-PC 3860, Psy 3840.* Directed Research

PSY-PC 3980, 3981, 4998, 4999, or Psy 3980, 3981, 4998, 4999.*

Honors Research
SPEDS 2430. Introduction to Language and Communication

NOTE: Research/experiential courses marked * above may be repeated freely for elective credit toward graduation. However, only a total of 6 hours from among these courses, in any combination, may be used as elective credit within the major.

Second Major and Electives. 51-52 hours.

Minors

The Minor in Child Development

The minor in child development consists of 18 hours in the following courses:

PSY-PC 1250. Developmental Psychology
PSY-PC 2110. Introduction to Statistical Analysis (may be taken as part of the Liberal Education Core)

One of the following:
PSY-PC 2250. Cognitive Aspects of Human Development
PSY-PC 2400. Social and Personality Development

One of the following:
PSY-PC 2500. Infancy
PSY-PC 2550. Adolescent Development

One of the following:
PSY-PC 2170. Experimental Methods
Psy 2150. Principles of Experimental Design
PSY-PC 3722. Psychometric Methods

One child development elective course
(Any of the courses above not taken to meet a minor requirement or any course listed as an elective for the child development major)

The Minor in Cognitive Studies

The minor in cognitive studies consists of 15 hours in the following courses:

REQUIRED COURSES. (6 hours)

PSY-PC 1205. Minds, Brains, Contexts, and Cultures
or PSY-PC 1207.
PSY-PC 2200. Psychology of Thinking
or Psy 3120. Cognitive Psychology

ELECTIVE COURSES. (9 hours)

ANTH 2601. Introduction to Linguistics
ENED 2430. Fostering Language in the Classroom
PSY-PC 1115. First-Year Seminar
or PSY-PC 1157.
PSY-PC 2250. Cognitive Aspects of Human Development
PSY-PC 2300. Social and Emotional Context of Cognition
PSY-PC 2400. Social and Personality Development
PSY-PC 3150. Language Development
PSY-PC 3650. Advanced Topical Seminar (Intended for students beyond the first year. May be repeated if no duplication of content.)
Psy 3775. Human Memory
Psy 3635. Health Psychology
PSY-PC 3200. Introduction to Clinical Psychology
PSY-PC 3860, 3980, 3981, 4998, 4999. Directed Research/Honors Research (may *not* be repeated for minor credit)
SPEDS 2430. Introduction to Language and Communication

The Minor in Language Sciences

The minor in Language Sciences is offered through the Department of Psychology and Human Development. The emphasis is on language theory and research in the behavioral sciences. A working knowledge of the basic processes involved in speaking, understanding, and reading will be beneficial to students interested in the learning sciences. Total of 15 credit hours required for program or track completion.

Two of the following (6 hours):

- PSY-PC 3130. Introduction to Formal Linguistics
- PSY-PC 3140. Psychology of Language

Three of the following (9 hours):

- ANTH 1601. Introduction to Language and Communication
- PSY-PC 3150. Language Development
- PSY-PC 3160. Bilingualism
- PSY-PC 3170. Cognitive Science of Reading
- PSY-PC 3180. How We Talk
- PSY-PC 3190. Language and the Brain
- PSY-PC 3860. Directed Research (Must work on a study or project related to language sciences)
- SPEDS 2430. Introduction to Language and Communication
- SPEDH 3348. Language and Learning
- PHIL 3617. Philosophy of Language

The Minor in Quantitative Methods

Quantitative skills are highly valued in a variety of fields. Training provided by the quantitative methods minor can provide a competitive edge on the job market or for future graduate study. Many advances in quantitative methods used in the social sciences and education are not covered in standard undergraduate introductory statistics courses. This minor exposes students to more recent developments in quantitative methods with concrete applications to practice. The quantitative methods minor helps students become better consumers and producers of scientific research. Students will have the opportunity to learn from leading experts in the statistical analysis of social science data.

Structure of the Minor

Prerequisite for the minor is completion of the introductory statistics sequence that is already required by the undergraduate psychology majors. This sequence is:

- PSY-PC 2110. Introduction to Statistical Analysis (3 hours)
- or PSY 2100. Quantitative Methods (3 hours)

And

- PSY-PC 2120. Statistical Analysis (3 hours)

The quantitative methods minor is an 18-hour minor. The 18 hours include both PSY-PC-2110 (or PSY 2100) and PSY-PC 2120, and these serve as prerequisite courses for the electives. Following completion of these prerequisite courses (6 hours; required), the minor requires four additional courses (12 hours; electives). Any four courses offered by the Quantitative Methods program are applicable. At most, three hours of directed research/independent study can count toward the minor. Students with interest in directed research/independent study can contact individual quantitative methods faculty directly.

Courses that would satisfy the elective requirements (pick 4):

- PSY-PC 3722. Psychometric Methods
- PSY-PC 3724. Psychometrics
- PSY-PC 3727. Modern Robust Statistical Methods
- PSY-PC 3730. Applied Latent Class and Mixture Modeling
- PSY-PC 3732. Latent Growth Curve Modeling
- PSY-PC 3735. Correlation and Regression

- PSY-PC 3738. Introduction to Item Response Theory
- PSY-PC 3743. Factor Analysis
- PSY-PC 3746. Multivariate Statistics
- PSY-PC 3749. Applied Nonparametric Statistics

Prior to enrolling in a specific course, please contact the instructor regarding prerequisite courses. Undergraduates may request to be enrolled in QM graduate courses not yet cross-listed as undergraduate courses by using a substitution form, with permission of instructor. We anticipate adding more courses to the list of electives, which will be posted at peabody.vanderbilt.edu/departments/psych/undergraduate_programs/quantitative_methods_minor.php

For inquiries about the quantitative methods minor, email kris.preacher@vanderbilt.edu

Majors in Early Childhood and Elementary Education, and Secondary Education

CHAIR, DEPARTMENT OF TEACHING AND LEARNING Deborah W. Rowe
ASSOCIATE CHAIR FOR TEACHER EDUCATION Anita Wager

DIRECTOR OF UNDERGRADUATE STUDIES Catherine McTamane
PROFESSORS EMERITI Paul A. Cobb, Carolyn M. Evertson, Dale Clark
Farran, Richard Lehrer, Charles Myers, Victoria J. Risko, Leona Schauble,
Virginia Shepherd

PROFESSORS David K. Dickinson, Noel Enyedy, Rogers Hall, Ilana Horn,
Robert Jiménez, Kevin Leander, Henry "Rich" Milner IV, Deborah W.
Rowe

PROFESSORS OF THE PRACTICE EMERITA Earline Kendall, Barbara
Stengel

PROFESSORS OF THE PRACTICE Ana Christine DaSilva, Brian Kissel, Lisa
Pray, Anita Wager

RESEARCH PROFESSOR Kathy Ganske

RESEARCH ASSISTANT PROFESSORS Caroline Christopher, Kelley Durkin,
Jennifer Unfar

ASSOCIATE PROFESSORS Amanda Goodwin, Melissa S. Gresalfi,
Jeannette Mancilla-Martinez, Ebony O. McGee

ASSOCIATE PROFESSORS OF THE PRACTICE Molly Collins, Shannon
Daniel, Andrew Hostetler, Melanie Hundley, Heather L. Johnson,
Catherine McTamane, Ann M. Neely, Emily Pendergrass

ASSISTANT PROFESSORS Corey Brady, Nicole Joseph, Luis Leyva, Emily
Phillips-Galloway, Jessica Watkins

ASSISTANT PROFESSORS OF THE PRACTICE Teresa K. Dunleavy, Amy B.
Palmeri, Elizabeth Self

PRINCIPAL SENIOR LECTURER Jeanne Peter

SENIOR LECTURERS Andrea Henrie, Kristen Neal

LECTURERS Justine Bruyere, Nicole Chaput-Guizani, Ocheze Joseph,
Rebecca Peterson

Early Childhood and Elementary Education

Early Childhood Education

THE specialization in early childhood education (ECE) is a field-oriented program designed to prepare students for work with children in preschool programs and in primary grades (grades PreK-3). Beginning in the freshman year, students observe and participate in local schools and agencies and in experimental classrooms on campus. Most Liberal Education Core courses are taken in the College of Arts and Science.

Students must combine a specialization in early childhood education with a second major. Course work beyond the standard 120-hour program may be required for some double majors.

Vanderbilt students seeking teacher licensure must apply through the Office of Teacher Licensure at Vanderbilt and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered Vanderbilt. Licensure requirements are currently undergoing change. Each year, teacher licensure candidates should consult the current *Vanderbilt Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Undergraduate Student Affairs.

B.S. Degree Requirements Early Childhood Education (PreK-3 Licensure)

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 60 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the *Peabody Undergraduate Handbook* (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Professional Education Core. 34 hours.

EDUC 1220, 3120, 3212, 3214, 3215, 3270; HMED 3250; MTED 3250; PSY-PC 2600; SCED 3240; SSED 3240; SPED 1210

Field Experiences. 15 hours.

EDUC 3216, 3240, 4952, 4962, MTED 3251

A second major is required.

For students interested in PreK-5 licensure, it may be possible to combine course work from the early childhood major and the elementary major. Interested students should discuss this with Professor Amy Palmeri.

Elementary Education

THE specialization in elementary education is field-oriented and designed to prepare students to teach children in grades K-5. Beginning in the freshman year, students observe and participate in local schools and experimental classrooms on campus. Most Liberal Education Core courses are taken in the College of Arts and Science.

Students must combine a specialization in elementary education with a second major in the liberal arts, an interdisciplinary major, or another major offered by Peabody College or the College of Arts and Science. Course work beyond the standard 120-hour program may be required for some double majors.

Vanderbilt students seeking teacher licensure must apply through the Office of Teacher Licensure at Vanderbilt and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered the program. Licensure requirements are currently undergoing change. Each year, teacher licensure candidates should consult the current

Vanderbilt *Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Undergraduate Academic Affairs.

B.S. Degree Requirements Elementary Education (K–5 Licensure)

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 60 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Professional Education Core. 28 hours.

EDUC 1220, 3212, 3214, 3215, 3270; MTED 3250; SCED 3240; SSED 3240; HMED 2250; SPED 1210; PSY-PC 2600

Field Experiences. 15 hours.

EDUC 3216, 3240, 4952, 4962; MTED 3251

An approved second major is required.

For students interested in PreK-5 licensure, it may be possible to combine course work from the early childhood major and the elementary major. Interested students should discuss this with Professor Amy Palmeri.

Secondary Education

THE major in secondary education is designed to prepare the student to teach one or more subjects at the secondary level (grades 6–12). Students must complete Liberal Education Core requirements, Professional Education requirements, and a primary area of emphasis in at least one endorsement field, which involves 27 to 36 hours of course work in the discipline and results in a major in that area as defined by the College of Arts and Science. Specific requirements for a second area of endorsement may be obtained from the Office of Teacher Licensure in the Peabody Administration Building. Students must take the appropriate methods course for each area of endorsement.

Vanderbilt students seeking teacher licensure must apply through the Peabody Office of Teacher Licensure and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered Vanderbilt. Licensure requirements are currently undergoing change. Each year, teacher licensure candidates should consult the current Vanderbilt *Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Undergraduate Academic Affairs.

B.S. Degree Requirements Secondary Education (6–12 Licensure)

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 60 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the *Peabody Undergraduate Handbook* (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Secondary Education Undergraduate Courses

FOUNDATIONAL AND CORE COURSES

EDUC 1220. School and Society [3]
SPED 1210. Introduction to Exceptionality [3]
PSY-PC 2550. Adolescent Development [3]
EDUC 3620. Social and Philosophical Foundations of Education [3]
EDUC 3310. Classroom Ecology [3]

FIELD BASED COURSES

EDUC 3871. Practicum in Secondary Education I [1]
EDUC 3872. Practicum in Secondary Education II [1]
ENED, MTED, SCED, or SSED 3371. Practicum in Secondary Education III [1]
EDUC 4953. Student Teaching in the Secondary School [9]

CONTENT AREA COURSES

English

ENED 3340. Reading and Learning with Print and New Media [3]
ENED 3357. Literature, Pop Culture, and New Media [3]
ENED 3370. Teaching Literature and New Media in the Secondary Schools [3]
ENED 3380. Teaching Writing in Secondary Schools [3]
ENED 4963. Student Teaching Seminar: Secondary [3]

Mathematics

MTED 3320. Introduction to Literacies in Mathematics [3]
 MTED 3360. Computers, Teaching, and Mathematical Visualization [3]
 MTED 3370. Teaching Mathematics in Secondary School [3]
 MTED 4963. Student Teaching Seminar: Secondary [3]

Science

SCED 3320. Introduction to Literacies in Science [3]
 SCED 3400. Modeling in the Secondary Classroom [3]
 SCED 3370. Teaching Science in Secondary Schools [3]
 SCED 4963. Student Teaching Seminar: Secondary [3]

Social Studies

SSED 3320. Introduction to Literacies in Social Studies [3]
 SSED 3260. Human Geography [3]
 SSED 3370. Teaching Social Studies in Secondary Schools [3]
 SSED 4963. Student Teaching Seminar: Secondary [3]

An approved second major is required.

B.S. Degree Requirements Educational Studies

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 60 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located on the online *Peabody Undergraduate Handbook* (<http://Peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-year Seminars when open registration begins.

Major Foundations. 9 hours.

EDUC 1220 Society, School & Teacher, SPED 1210 Introduction to Exceptionality, PC-PSY 1250 or 2550 Developmental Psychology

Learning and Equity in Diverse Contexts Specialization

Learning and equity in diverse contexts is focused on the interaction of learning, design, and context in out-of-school settings, attracting students who are interested in learning in informal settings. This specialization is appropriate for students who envision themselves working and learning with students out of traditional classroom settings.

Note: Students may enroll in this specialization after matriculation to the university, but may not be admitted directly into this program. Educational Studies can serve as a student's first or second major, but must be a third major or minor if combined with a licensure program. Students must use the Change of Major/Minor Declaration/Change form to declare educational studies as their first, second, or third major.

LEARNING, DEVELOPMENT AND CONTEXT CORE (9 hours chosen from the following)

EDUC 3140. Learning and Development in Early Childhood Education
 EDUC 2160. Cultural Diversity in American Education
 EDUC 3120. Children in Families and Schools
 EDUC 2920. Social & Philosophical Aspects of Education

FIELD WORK IN EDUCATIONAL STUDIES (12 hours)

EDUC 3861. Initial Fieldwork in Educational Studies [3]
 EDUC 3862. Advanced Fieldwork in Educational Studies [3]
 EDUC 4950. Capstone Fieldwork in Educational Studies [6]

PLUS ELECTIVE COURSES (3 hours)

EDUC 3180/3270. Managing Instructional Settings
 ENED 2430. Fostering Language in Diverse Classrooms
 ENED 3350. Literature, Popular Culture & New Media
 HMED2150/2250. Children's Development in the Arts
 MTED 2100. Young Children's Mathematical Thinking and Learning
 MTED 3320. Intro to Math Literacies
 MTED 3360. Math Visualizations
 PC-PSY 2600. Educational Psychology
 PHIL 3603. Philosophy of Education
 SCED 3320. Intro to Science Literacies
 SSED 2100. Scientific and Historical Reasoning in Young Children
 SSED 3260. Human Geography
 SPED 3332. High Poverty Youth

Additional courses as approved by adviser and UAC

Early Childhood and Elementary Education, and Secondary Education Specializations

These are alternative education studies specializations that are available only to students with these first majors who discover they are unable to complete their major requirements pre-student teaching after it is too late to complete a different first major to graduate. These educational studies specializations are initiated by the director of undergraduate studies, in consultation with the student and the early childhood, elementary, or secondary education major advisers. Students must use the Change of Major/Minor Declaration/Change form to declare education studies as their first or second major.

Early Childhood and Elementary Specializations (23 hours)

EDUC 3212. Introduction to Reading Processes and Assessment [3]
 EDUC 3214. Reading in Elementary Schools [3]
 EDUC 3215. Language Arts in Elementary Schools [3]
 MTED 3250. Teaching Mathematics in Elementary Schools [2]
 SSED 3240. Teaching Social Studies in Elementary Schools [2]
 SCED 3250. Teaching Science in Elementary Schools [2]
 HMED 2250. Introduction to Arts Education [2]
 EDUC 3270. Managing Instructional Settings [2]
 EDUC 3216. ELE Practicum: Language and Literacy [1]
 EDUC 3240. ELE Practicum: Science and Social Studies [1]
 MTED 3251. ELE Practicum: Mathematics and Science [1]
 PSY-PC 2600. Educational Psychology [3]

Secondary Specialization (21 hours)

EDUC 3310. Teaching in Secondary Schools [3]
 EDUC 3720. Foundations for Teaching Linguistically Diverse Students [3]
 EDUC 3620. Foundations of Education [3]
 ENED/FLED/SCED/MTED/SSED 3320 [3] FLED/SCED/MTED/SSED 3370 or ENED 3380. Teaching Methods in Secondary Schools [3]
 EDUC 3871. Practicum in Secondary Education I [1]
 EDUC 3872. Practicum in Secondary Education II [1]
 ENED/FLED/SCED/MTED/SSED 3360. Practicum in Secondary Education III [1]
 SSED 3260. Human Geography [3]

Plus 3 hours of electives

Major in Human and Organizational Development

CHAIR Paul W. Speer

ASSOCIATE CHAIR Nicole A. Cobb

DIRECTOR OF UNDERGRADUATE STUDIES Leigh Z. Gilchrist

PROFESSORS EMERITI John M. Braxton, Robert L. Crowson, Jr., Joseph

J. Cunningham, Paul R. Dokecki, Craig Anne Heflinger, Robert B. Innes

PROFESSORS OF THE PRACTICE, EMERITA Vera A. Stevens Chatman,
Janet S. Eyler

PROFESSORS Sandra Barnes, Bradley T. Erford, Ellen Goldring, Carolyn

J. Heinrich, Velma McBride Murry, Joseph F. Murphy, Douglas D.

Perkins, Marybeth Shinn, Paul W. Speer

RESEARCH PROFESSOR Mark Lipsey

PROFESSOR OF THE PRACTICE Sharon L. Shields

ASSOCIATE PROFESSOR EMERITUS Richard L. Percy

ASSOCIATE PROFESSORS Mark D. Cannon, Brian D. Christens, Sean

Corcoran, Shaun Dougherty, William R. Doyle, James C. Fraser,

Jason A. Grissom, Christopher Loss, Maury Nation, Claire E. Smrekar

ASSOCIATE PROFESSORS OF THE PRACTICE Kimberly D. Bess, Xiu

Chen Cravens, Andrew J. Finch, Brian L. Heuser, Christine M. Quinn

Trank

ASSISTANT PROFESSORS Angela Boatman, Christopher H. Candelaria,

Ashley Carse, David K. Diehl, Brent J. Evans, Anjali Forber-Pratt,

Joanne W. Golann, Yolanda J. McDonald, Jessica M. Perkins, Sara

Safransky, Matthew P. Shaw, Adela Soliz

ASSISTANT PROFESSORS OF THE PRACTICE Susan Douglas, Gina

L. Frieden, Leigh Z. Gilchrist, David Laird, Heather L. Smith, Sarah V.

Suiter

PRINCIPAL SENIOR LECTURERS Leslie D. Kirby, Andrew J. Van Schaack

SENIOR LECTURERS Nicole A. Cobb, José Cossa, Corbette Doyle,

Heather Fedesco, Brenda McKenzie, Deborah D. Tobey

LECTURERS Ryan Balch, Kelly Duncan, Karen Enyedy Susan K.

Friedman, Daniel L. LeBreton, Heather C. Lefkowitz, Nancy Nolan,

Jeremy Payne, Michelle Perepiczka, Kristen C. Tompkins

The Human and Organizational Development major prepares students to solve human problems in organizations and communities. Doing so requires knowledge of human development, group dynamics, organizational theory and behavior, economics, public policy, statistics, and methods of inquiry. The curriculum is planned to ensure that students obtain a strong foundation in science and liberal arts, with an emphasis on developing writing, oral presentation, and analytic skills.

In addition to the core curriculum, students select a concentration or track that provides a focus for their study during the junior and senior years. The track options are Community Leadership and Development, Health and Human Services, International Leadership and Development, Leadership and Organizational Effectiveness, and Education Policy. Many students also add an additional major or minor which is handled through the respective departments of those programs.

The HOD program is guided by an active learning approach to education. Students learn new ideas and concepts through seminars, simulations, case studies, field experiences, and interaction with professionals in the field. In addition, students are required to complete a semester-long capstone internship during which they demonstrate the core competencies of HOD: understanding and solving problems in organizations and communities. Through the course work that accompanies the internship, students integrate and apply concepts from earlier classes to understand organizational performance and complete a project that enhances the effectiveness of the organization. Because the student chooses the internship placement, this experience also provides valuable vocational and career development in the

student's field of interest. Students can apply for internships in Nashville, Chicago, New York, San Francisco, Washington, D.C., and London, England.

Graduates of the program assume positions in business, government agencies, social enterprises, and non-profit organizations. In addition, many students enter graduate or professional programs in business, community development, counseling, divinity, education, health promotion, human resource development, law, or medicine.

The core curriculum is designed to help students:

1. Understand the basic principles and typical patterns of human development across the life cycle and use this knowledge to understand their own behavior and the behavior of others;
2. Understand the principles of group dynamics and use this knowledge to provide leadership and facilitate decision making in small group settings;
3. Understand theories of organizations and apply them to the solution of organizational problems;
4. Apply quantitative and qualitative methods of systematic inquiry and analysis;
5. Understand basic economics including monetary and fiscal theory;
6. Understand public policy processes and the factors that influence policy making;
7. Understand the ethical dimensions of personal and organizational decisions and apply this understanding to analyze social issues and make professional and personal decisions;
8. Develop enhanced skills of synthesis including the ability to integrate ideas from various sources, to appreciate diversity, and to design innovative programs.

In addition, the program helps students develop the following skills:

1. *Written communication* with emphasis on developing a clear, concise, expository style and mastering the practical forms used in professional situations;
2. *Oral presentation* with emphasis on making informative and persuasive presentations with the effective use of technology and media;
3. *Analytic thinking* with emphasis on applying analysis, creative thinking, and the skills of systems thinking to the recognition, definition, and solution of personal, professional, organizational, and social problems;
4. *Interpersonal communication* with emphasis on inquiry, advocacy, and conflict resolution skills;
5. *Leadership* with emphasis on motivating others, managing talent, and teamwork.

Honors Program

The HOD Honors Program is designed for highly motivated students who are looking for an opportunity to pursue intensive study in personal areas of interest. It offers outstanding undergraduate HOD majors an opportunity to undertake advanced reading and become involved in research teams with professors and graduate students. The program also offers special opportunities for individual supervision that will help students develop writing and presentation skills to compete successfully in the world's best graduate programs.

The program is open to students who have completed the sophomore year with a 3.6 cumulative (overall) GPA. Students admitted to the honors program participate in advanced empirical (quantitative or qualitative) research for two semesters and complete an honors thesis. The HOD Honors Seminar, HOD 4987, will partially satisfy the Peabody writing requirement. Although not required, honors projects may be coordinated with HOD internships. Students are also encouraged to attend departmental colloquia and to take at least one graduate course in their area of interest.

Curriculum

Students take a minimum of 120 hours.

Liberal Education Core Requirements. 40 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Quantitative Analysis, Science, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). The HOD Honors Seminar, HOD 4987, will satisfy the writing requirement. In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-Year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-Year Seminars when open registration begins.

Human and Organizational Development Professional Core. 18 hours.

These courses are listed in the Courses of Study section under Human and Organizational Development and will include the following topics:

HOD 1250. Applied Human Development
HOD 1300. Small Group Behavior
HOD 2100. Understanding Organizations
HOD 2400. Talent Management and Organizational Fit
HOD 2500. Systematic Inquiry
HOD 2700. Public Policy

Practicum and Capstone Internship. 12-18 hours.

The program includes a full-time capstone internship (12 hours, if completed in summer; 15 hours, if completed in fall or spring) and an optional 3 hour practicum experience.

Track. 15 hours.

A block of courses within the student's area of concentration: (1) Community Leadership and Development, (2) Health and Human Services, (3) International Leadership and Development, (4) Leadership and Organizational Effectiveness, and (5) Education Policy.

Electives. 30-35 hours.

The Minor in Human and Organizational Development

The minor in human and organizational development consists of 18 hours in the following courses:

REQUIRED COURSE. 3 hours.

HOD 1250 Applied Human Development

CHOOSE TWO ADDITIONAL CORE COURSES. 6 hours.

HOD 1300. Small Group Behavior

HOD 2100. Understanding Organizations (required for Leadership and Organizational Effectiveness track students)

HOD 2500 Systematic Inquiry

HOD 2700 Public Policy

TRACK LEVEL COURSES: 9 hours.

Students will choose three courses (9 hours) from a single track to complete. The tracks are Community Leadership and Development, Health and Human Services, International Leadership and Development, Leadership and Organizational Effectiveness, and Education Policy.

Community Leadership and Development Track [9 hours]

The 9-hour CLD track core requires three of the following five courses:

HODC 3202 Community Development Theory

HODC 3232 Ethics for Human Development Professionals

HODC 3262 Social Entrepreneurship: Principles and Application

HODC 3342 Introduction to Community Psychology

HODC 3352 Philanthropy and Social Problem Solving

HODC 3650 Community Development Seminar (Rotating topics. Only one CLD seminar will count in the CLD track core)

Health and Human Services Track [9 hours]

The 9-hour HHS track core requires three of the following six courses:

HODH 3201 Introduction to Human Services

HODH 3211 Introduction to Counseling

HODH 3221 Health Service Delivery to Diverse Populations

HODH 3231 Introduction to Health Services

HODH 3241 Introduction to Health Policy

HODH 3650 Health and Human Services Seminar (Topics vary; only one HHS seminar will count in the HHS track core)

International Leadership and Development Track [9 hours]

The 9-hour ILD track core requires three of the following eight courses:

HODI 3200 Global Dimensions of Community Development

HODI 3210 Leadership and Change in International Organizations

HODI 3220 International Organizations and Economic Development

HODI 3230 Education and Economic Development

HODI 3240 Effectiveness in International For-Profit Organizations

HODI 3250 Building Knowledge Economics in Asia

HODI 3260 Education in the Asia-Pacific Region: Development, Reform, and Innovation

HODI 3270 Global Sustainable Development

Leadership and Organizational Effectiveness Track [9 hours]

The 9-hour LOE track core includes the following required courses:

HODL 3204 Leadership Theory and Practice (prerequisite or concurrent enrollment in HOD 2100)

HODL 3234 Advanced Organizational Theory (prerequisite or concurrent enrollment in HOD 2100)

And

One course chosen from the following five options:

HODL 3224 Analyzing Organizational Effectiveness

HODL 3244 Introduction to Human Resource Development

HODL 3254 Human Resource Management

HODL 3264 Evidence-based Practice in Organizations (prerequisite HOD 2100; concurrent enrollment allowed)

HODL 3274 Managing Organizational Change (prerequisite HOD 3204 or HOD 3234)

Education Policy Track [9 hours]

The 9-hour EP track core has the following required courses:

HODE 3205	Education Policy Analysis Methods (prerequisite HOD 2700 or PCSI 1100)
HODE 3215	Education and Public Policy (prerequisite HOD 2700 or PCSI 1100)
HODE 3225	Introduction to Public Finance of Education

Total hours in the minor: 18

Human and Organizational Studies

Human and Organizational Studies (HOS) is an alternative major that is available only to Human and Organizational Development (HOD) majors who, due to extenuating circumstances, are unable to complete the required HOD capstone internship after it is too late to complete a new first major. This alternative is initiated and approved by the director of the HOD Capstone Internship Program. In lieu of the HOD capstone internship, students complete an additional 9 hours (3 courses) of HOD track-level courses and HOD 4953 (3 hours). Students completing the HOS degree do not choose a track.

Students must complete the Human and Organizational Development liberal education core and the writing requirement, and earn a minimum of 120 hours.

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Undergraduate School Catalog

Major in Special Education

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THE undergraduate program in special education prepares students to work with persons with disabilities and leads to licensure in special education. Students pursue an interdisciplinary major in exceptional learning with emphasis in one of the two specialty areas: high-incidence disabilities (interventionist program K-8 and/or 6-12) or multiple and severe disabilities (comprehensive program). This major can be combined with other majors such as cognitive studies, child development, or majors in the College of Arts and Science. The program is field oriented and problem centered, with most professional courses requiring direct involvement with individuals with disabilities. Beginning in the freshman year, students observe and work in a variety of educational settings in local schools and in classrooms off campus.

Vanderbilt students seeking teacher licensure must apply through the Office of Teacher Licensure at Vanderbilt and must meet licensure requirements in effect at the time of their graduation, which may be different from licensure requirements in effect at the time they entered the program. Each year, teacher licensure candidates should consult the current *Vanderbilt Undergraduate Catalog*, the *Undergraduate Guide to Teacher Licensure* published by the Vanderbilt Office of Teacher Licensure, and the *Undergraduate Handbook* published by the Office of Administration and Records.

Honors Program

The Honors Program in Special Education offers qualified majors the opportunity to gain experience in conducting research in collaboration with a faculty mentor. This experience culminates in the writing and presentation of a senior project. Students who major in special education are eligible to apply for the Honors Program in the spring of their sophomore year if they have an overall grade point average of at least 3.5. Students who are accepted into the Honors Program, successfully complete the program, and maintain the required grade point averages, will graduate with Honors in Special Education. Specific information concerning admission to and the requirements of the Honors Program in Special Education is available from Professor Andrea Capizzi, director of undergraduate studies for the Department of Special Education.

Students should be aware that participation in the Honors Program is quite time-intensive and represents a substantial commitment of effort across at least three semesters. Therefore, potential participants must carefully consider whether they are able to, and want to, devote the required time and energy to this program.

B.S. Degree Requirements

NOTE: New course numbers took effect in fall 2015. Former course numbers are included in course descriptions in this catalog and at this website: registrar.vanderbilt.edu/faculty/course-renumbering/course-lookup/.

Specializations are available in high-incidence disabilities/interventionist (grades K-8/6-12 interventionist licensure), and severe disabilities (grades K-12 comprehensive licensure). Total hours will vary depending on the area of specialization.

Students take a minimum of 120 hours, distributed as follows:

Liberal Education Core Requirements. Minimum 60 hours.

The Liberal Education Core is composed of required course work from the areas of Communications, Humanities, Mathematics, Science, Cultural Studies, Social Science, and Electives. Listings of all courses that may fulfill these areas are located online in the Peabody Undergraduate Handbook (<http://peabody.vanderbilt.edu/admin-offices/oas/downloads.php>).

Writing Requirement

All Peabody College freshmen who have not earned a combined score of 660 on the evidence-based reading and writing component of the redesigned SAT with minimum scores of 27 on the reading component and 28 on the writing and language component, or ACT English test score of 30 or above, or AP or IB English scores above 4 and 6 respectively, are required to successfully complete English 1100. Regardless of AP or IB credits, all freshmen must successfully complete one writing-intensive course before their fourth semester. Writing-intensive courses either have a "W" after the course number (A&S courses) or end with the digit "7" (Peabody courses). In addition, before graduation, all students must successfully complete a second writing course.

NOTE: First-Year Seminars (courses numbered 1111) offered through the College of Arts and Science and the Blair School of Music may count as writing intensive courses. Peabody freshmen may only register for First-Year Seminars when open registration begins.

Specializations

The following SPED course is taken as part of the Liberal Education Core, but is also required in each area of specialization.

SPED 1210. Introduction to Exceptionality

The following courses are required in each area of specialization.

SPED 1175. Freshman Seminar

SPED 2310. Managing Academic and Social Behavior

SPED 4950. Student Teaching Seminar

SPED 4954 or 4951. Student Teaching

SEVERE DISABILITIES PROGRAM/COMPREHENSIVE CORE.

- SPEDS 2120. Issues in Family Intervention
 SPEDS 2450. Augmentative and Alternative Communications
 SPEDS 2430. Introduction to Language and Communications*
 SPEDS 3300. Methods of Instruction for Students with Severe and Multiple Disabilities
 SPEDS 3312. Procedures in Transition to Adult Life
 SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties: K-8
 SPEDH 3338. Teaching Reading to Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDS 3330. Characteristics of Students with Severe and Multiple Disabilities
 SPEDS 3350. Access to General Education and Teaching Functional Academics
 SPEDS 3661. Fieldwork in Special Education: Severe Disabilities
 SPEDS 3667. Seminar in Severe Disabilities Fieldwork
 SPEDS 3871. Field Work in Special Education: Autism, Intellectual, and Multiple Disabilities

HIGH-INCIDENCE PROGRAM/MODIFIED/INTERVENTIONIST CORE.

- (Courses and specific to choice of licensure track.)
 SPED 2160. Cultural Diversity in American Education*
 SPEDH 3308. Understanding Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDH 3318. Assessment for Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties: K-8
 SPEDH 3338. Teaching Reading to Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDH 3348. Language and Learning*
 SPEDH 3358. Advanced Reading Methods for Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDH 3368. Teaching Middle School Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDH 3378. Teaching High School Students with Severe and Persistent Academic and Behavior Difficulties
 SPEDH 3388. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties 6-12
 SPEDH 3777. School and Classroom Supports for Teaching Students with Academic Behavior Difficulties
 SPEDH 3871. Field Work in Special Education for Mild/Moderate Disabilities

*Taken as part of the Liberal Education Core

Minor in Special Education

The minor in special education provides students with an opportunity to develop familiarity and expertise in working with children who have learning and social behavior problems. The minor requires 17 hours (15 unique to the minor) as detailed below.

Required for all tracks (3 hours)

- SPED 1210. Introduction to Exceptionality (3)

Electives (14 hours)

- SPED 2310/3871. Managing Academic and Social Behavior (fieldwork) [3/1]
 SPEDH 3308. Understanding Students with Severe and Persistent Academic and Behavior Difficulties [3]
 SPEDH 3328/3871. Teaching Math to Students with Academic and Behavior Difficulties (fieldwork) [3/1]
 SPEDH 3338/3871. Teaching Reading to Students with Academic and Behavior Difficulties (fieldwork) [3/1]
 SPEDH 3348. Language and Learning [3]
 SPED 2160. Cultural Diversity in American Education [3]
 SPEDS 2120. Family Intervention [3]
 SPED 2340. Introduction to Language and Communication [3]
 SPED 3330/3871. Characteristics of Severe and Multiple Disabilities (fieldwork) [3/1]
 SPED 3312/3871. Procedures in Transition to Adult Life (fieldwork) [3/1]
 SPEDS 3350. Access to General Education and Teaching Functional Academics [3]

Most courses are taught in sequence and have prerequisite courses.

Disability Studies

Disability studies is an alternative major that is available *only* to special education (SPED) majors who discover they are unable to complete required SPED pre-student teaching and/or student teaching capstone after it is too late to complete a different first major. This alternative is initiated by the director of undergraduate studies, with consultation with SPED track directors and the Teacher Preparation Committee. Students completing the disability studies degree do not choose a track.

Honors

Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the university. The recipient is named by the Dean after consideration of faculty recommendation and overall academic achievements, as well as grade point averages of the year's highest ranking summa cum laude graduates.

Latin Honors Designation

Honors, which are noted on diplomas and published in the Commencement Program, are earned as follows:

Summa Cum Laude. Students whose grade point average equals or exceeds that of the top 5 percent of the previous year's graduating seniors.

Magna Cum Laude. Students whose grade point average equals or exceeds that of the next 8 percent of the previous year's graduating seniors.

Cum Laude. Students whose grade point average equals or exceeds that of the next 12 percent of the previous year's graduating seniors.

Dean's List

The Dean's List recognizes outstanding academic performance in a semester. Students are named to the Dean's List when they earn a grade point average of at least 3.500 while carrying 12 or more graded hours, with no temporary or missing grades in any course (credit or non-credit), and no grade of F.

Kappa Delta Pi

Kappa Delta Pi is an education honor society organized in 1911 at the University of Illinois to foster excellence in scholarship, high personal standards, improvement in teacher preparation, distinction in achievement, and contributions to education. Membership is limited to juniors and seniors with a grade point average of 3.500 or better, and graduate students with a grade point average of 3.750 or better. Candidates for membership must have completed at least 9 hours in education or psychology.

Honor Societies for Freshmen

Freshmen who earn grade point averages of 3.500 or better for their first semester are eligible for membership in the Vanderbilt chapters of Phi Eta Sigma and Alpha Lambda Delta.

Awards

KEVIN LONGINOTTI AWARD. Awarded annually to a graduating senior in the Department of Teaching and Learning who shows exceptional promise as a future teacher at the secondary school level.

DOROTHY J. SKEEL AWARD FOR OUTSTANDING PROFESSIONAL PROMISE (ELEMENTARY/EARLY CHILDHOOD EDUCATION). Presented annually to the graduating senior in the Department of Teaching and Learning who has shown exceptional promise as a future teacher at the elementary school or early childhood level.

SENIOR THESIS AWARD. Awarded to the graduating senior in the Human and Organizational Development Program who has submitted the most outstanding senior thesis. The winner is selected from a group of five finalists who make an oral presentation of their theses to a panel of five professors.

THE DEPARTMENT OF SPECIAL EDUCATION DISTINGUISHED ACADEMIC ACHIEVEMENT AWARD. Awarded annually to the graduating senior in the Department of Special Education who exemplifies the highest level of academic achievement.

THE DISTINGUISHED SERVICE IN SPECIAL EDUCATION AWARD. Presented annually to the graduating senior in the Department of Special Education who exemplifies the highest commitment to professional service in special education.

THE PEABODY ALUMNI AWARD. Awarded by the Peabody Alumni Association to a member of the graduating class who has demonstrated outstanding qualities of scholarship and leadership.

THE WILLIS D. HAWLEY AWARD. Awarded by students of Peabody College to a senior who exemplifies Peabody's commitment of service to others.

DEAN'S AWARD FOR OUTSTANDING SCHOLARSHIP. Awarded to each summa cum laude graduate.

YOUNG ALUMNI BOARD AWARD. Awarded by Peabody students to a senior who has demonstrated outstanding qualities of scholarship, leadership, and commitment of service to others. The recipient of this award represents the graduating class as a member of the alumni board for a two-year term.

PSYCHOLOGY AND HUMAN DEVELOPMENT UNDERGRADUATE HONORS AWARD. Awarded to the graduating senior who has successfully completed the Undergraduate Honors program in Cognitive Studies, or Child Development, or Child Studies and who has produced the best overall honor project.

EXCELLENCE IN CHILD DEVELOPMENT AWARD. Awarded to the graduating senior majoring in Child Development whose work in the opinion of the faculty of the Department of Psychology and Human Development exemplifies academic excellence.

EXCELLENCE IN COGNITIVE STUDIES AWARD. Presented annually by the Department of Psychology and Human Development to the graduating senior who most clearly exemplifies the goals of the Cognitive Studies Department.

HUMAN AND ORGANIZATIONAL DEVELOPMENT AWARDS. Established in 1999 and presented to the graduating seniors who exemplify the highest levels of scholarship and leadership in the Human and Organizational Development Program. The awards are given in these areas: Community Service, Outstanding Community Development and Social Policy, Outstanding Health and Human Services, and Outstanding Leadership and Organizational Effectiveness.

SPECIAL EDUCATION TEACHER OF EXCELLENCE AWARD. Established in 1999. Awarded annually by the Department of Special Education to the graduating senior who has demonstrated the highest level of excellence in teaching in the area of special education.

Post-Baccalaureate Programs

PEABODY offers professional degree programs in the following areas. Details of the post-baccalaureate programs are published in the *Peabody College Catalog*, available on request from the Office of Admissions and Records at Peabody College.

Major	Degree	Department
Child Studies	M.Ed.	Psychology and Human Development
Clinical Psychological Assessment	M.Ed.	Psychology and Human Development
Community Development and Action	M.Ed.	Human and Organizational Development
Education Policy	M.P.P.	Leadership, Policy, and Organizations
Educational Leadership and Policy	Ed.D.	Leadership, Policy, and Organizations
Elementary Education	M.Ed.	Teaching and Learning
English Language Learners	M.Ed.	Teaching and Learning
Higher Education Administration	M.Ed.	Leadership, Policy, and Organizations
Higher Education Leadership and Policy	Ed.D.	Leadership, Policy, and Organizations
Human Development Counseling	M.Ed.	Human and Organizational Development
Independent School Leadership	M.Ed.	Leadership, Policy, and Organizations
International Education Policy and Management	M.Ed.	Leadership, Policy, and Organizations
Leadership and Learning in Organizations	Ed.D.	Leadership, Policy, and Organizations
Leadership and Organizational Performance	M.Ed.	Leadership, Policy, and Organizations
Learning and Instruction	M.Ed.	Teaching and Learning
Learning, Diversity, and Urban Studies	M.Ed.	Teaching and Learning
Quantitative Methods	M.Ed.	Psychology and Human Development
Reading Education	M.Ed.	Teaching and Learning
Secondary Education	M.Ed.	Teaching and Learning
Special Education	M.Ed.	Special Education

Five-year Child Studies Program at Peabody

The five-year Child Studies program offered by Peabody College is designed to blend the undergraduate program with the master's level program. Students who successfully complete this combined program will earn their undergraduate B.S. degrees and also earn their M.Ed. degrees by the end of their fifth year at Peabody.

Under the combined five-year plan, undergraduates take 6 credit hours of professional courses during the senior year as part of the 120 hours required for the B.S. degree. Professional credit hours may not be used to satisfy undergraduate major course requirements. A fifth year (including summer) follows, during which students complete the additional 30 professional hours necessary for the master's degree. Students in this five-year program may take 6 hours during the senior year. Students who plan to pursue a five-year program are required to abide by the following guidelines; admission is competitive, and meeting minimum requirements does not guarantee admission.

- Students should make application to the program by the middle of the junior year at Vanderbilt.
- Applicants must have earned a minimum 3.00 grade point average.
- Courses may not be transferred from another university as a part of the master's degree.

Child Studies

The master of education (M.Ed.) in Child Studies is designed to give strong undergraduate students graduate preparation and related supervisory experience pertinent to career development or further graduate/professional study involving children, adolescents, families, schools, and related community services.

This 36-hour master's program consists of 12-18 credit hours of core curriculum course work and 18-24 credit hours of elective course work that are individually tailored to each student's personal interests and professional goals. Our program offers traditional classroom preparation alongside hands-on practicum experiences or research mentorships, which are integrated into the program of studies.

All students choose to complete one of two tracks: the Applied Professional Track or the Empirical Research Track. Both program options require that students become skilled in integrating current child development research and theory with effective practice in academic or professional settings. Required courses focus on applied child development, developmental theory, and research methodology. Within each track, there are additional areas of concentration including, but not limited to, pediatric health care, developmental disabilities and early intervention services, early childhood, child advocacy and public policy, youth development, poverty and interventions, and arts and media. This degree culminates in a capstone project exam that reflects the unique set of academic and professional experiences that compose the students' program of studies.

Peabody College Courses

Human and Organizational Development

HOD 1001. Commons Seminar. [Formerly HOD 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

HOD 1115. First-Year Seminar. [Formerly HOD 1150] Selected topics for first-year students. [3]

HOD 1250. Applied Human Development. [Formerly HOD 1000] Introduction to the processes of human development and how such development can be influenced. Emphasis is placed on social development and implications for solving personal and professional problems. The course focuses on late adolescent and young adult development. [3]

HOD 1300. Small Group Behavior. [Formerly HOD 1100] Introduction to the processes of human development and how such development can be influenced. Emphasis is placed on social development and implications for solving personal and professional problems. The course focuses on late adolescent and young adult development. [3]

HOD 2100. Understanding Organizations. [Formerly HOD 1200] Organizations are comprised of individuals with diverse interests functioning within rapidly changing, complex environments, often with limited resources. Accordingly, understanding organizations requires multiple perspectives and approaches to problem-solving. Students in the course will learn to apply organizational theories to specific challenges in order to generate potential solutions that promote organizational health. HOD 2100 can substitute for BUS 2400 in the business minor. Credit cannot be earned for both HOD 2100 and BUS 2400. [3]

HOD 2260. Economics of Human Resources. [Formerly HOD 2260] An introduction to economics, with heavy emphasis on microeconomics of the family, household, consumer, and business firm. Applications to the economics of government, poverty, discrimination, labor markets, the environment, education, and other human resource and human development topics will be included. The class will be primarily lecture format with some small group interactions and discussions. Prerequisite - Statistics Course: PSY-PC 2110, PSY 2100, ECON 1500, MATH 2810 or MATH 2820. [3]

HOD 2400. Talent Management and Organizational Fit. [Formerly HOD 1400] The course provides a general overview of social, economic, and other environmental factors impacting the world of work and helps students in understanding how organizations are responding to this changing landscape. The course also enables students to critically engage this context by developing competencies and skills which will be applicable in a diversity of settings. [3]

HOD 2500. Systematic Inquiry. [Formerly HOD 1700] This course offers an introduction to social science research methods covering qualitative and quantitative approaches. Students will develop the ability to critically analyze research studies as well as collaborate with others to conduct studies of their own, reporting their results in a professional format. [3]

HOD 2700. Public Policy. [Formerly HOD 1800] An exploration of the creation, interpretation, implementation, and evaluation of public policy in the United States. Main emphases include key analytical/theoretical perspectives necessary for understanding the policy making process (problem identification, agenda setting, formulation, adoption, implementation, and evaluation), and main factors that influence policy making at the national and state levels. Particular attention is paid to the development of student analytic and writing skills. [3]

HOD 3200. Introduction to Data Science. Provides students with both theoretical and practical knowledge of data science, including accessing data, analyzing data, and presenting data analysis. Data

access topics include web scraping, using application programming interfaces and database queries. Data analysis topics include linear regression, logistic regression, and basics of unsupervised machine learning. Data analysis will also cover cross validation. Data presentation topics include univariate and bivariate graphs, lattice graphing, mapping and interactive graphics. Emphasizes literate programming as basis for access, analysis and presentation. Prerequisite: Introductory Statistics or permission of instructor. [3]

HOD 3250. Causal Inference. The purpose of this course is to prepare participants to design and carry out social science research estimating the effects of educational interventions, programs and policies that is sufficiently credible to influence decisions about these educational practices and for publication in scholarly, social science journals including education and public policy. A second purpose is to enable participants to fairly and rigorously evaluate the contributions and limitations of empirical social science manuscripts that address significant causal questions for education practice and policymaking. The course will develop your understanding of the theoretical constructs that underlie causal inference, contribute to your understanding of some aspects of descriptive social science, and aid you in the development of appropriate criteria for assessing the contributions of particular studies to social science research literature. Prerequisite: HODE 3205 (or equivalent), PSY-PC 2115 (or equivalent), and PSY-PC 3735 (or equivalent) and permission of instructor. [3]

HOD 3275. Practical Meta-analysis. The topics covered in this seminar will include the major steps involved in conducting meta-analysis, with particular emphasis on the technical issues and statistical analyses distinctive to this form of research. Specifically, the course will focus on providing students with the skills needed to be intelligent consumers of systematic reviews and meta-analyses: conduct a systematic, replicable search of the literature used to identify studies eligible for a meta-analysis; create and analyze meta-analytic databases using appropriate statistical techniques; and prepare written reports of meta analytic findings. Prerequisite: PSY-PC 2110 and PSY-PC 3735. [3]

HOD 3300. Judgment and Analytical Reasoning. This course presents the cognitive, emotional, and contextual factors that affect judgment and decision-making. Through real-world examples, students will learn to identify common errors in human reasoning and develop an understanding of a variety of analytic strategies to overcome them. The primary tool for conducting these analyses will be Microsoft Excel. (Developing proficiency in Excel for analysis and reporting findings is a secondary goal of this course.) Features and functions of Excel will be taught in the context of the course content and third-party validation of Excel skills will be obtained through Microsoft Certification at the Basic and Expert levels. [3]

HOD 3850. Independent Study in Human and Organizational Development. [Formerly HOD 2980] Individual programs of reading or the conduct of research studies in human and organizational development. Consent of supervising faculty member required. May be repeated. [1-3]

HOD 3860. Directed Research. [Formerly HOD 2989] Consent of supervising faculty member required. May be repeated. [1-3]

HOD 3864. Research Experience. [Formerly HOD 2950] This course provides undergraduate students in HOD direct experience in conducting research. The course is designed for students interested in going on to graduate school as well as students who want to gain experience in generating knowledge in an information economy. The course conducts a review of research methodologies and requires students to critically read and deconstruct published research studies. Data analysis skills are sharpened in the computer lab and put into practice on their own research. Students conduct several independent research projects during the semester. Prerequisite: HOD 2500 and a statistics class. [3]

HOD 3870. Practicum in Human and Organizational Development. [Formerly HOD 2000] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

HOD 3890. Special Topics in Human and Organizational Development. [Formerly HOD 2290] Exploration of special issues on topics related to human and organizational development. May be repeated for credit with change of topic. [1-3]

HOD 4950. On Site Experience. [Formerly HOD 2900] Students complete an immersive learning experience with an organization, collecting field notes and observations, conducting informational interviews and internal research, and completing workplace duties as assigned. Corequisite: HOD 4951, 4952, 4953 [3-6]

HOD 4951. Critical Reflection. [Formerly HOD 2910] Students develop skills in critical reflection using a case study model to process and analyze workplace behavior, structures, dynamics, and culture using theories from earlier course work. Corequisite: HOD 4950, 4952, 4953 [3]

HOD 4952. Self-Directed Learning. [Formerly HOD 2920] Students use self-directed learning to identify learning goals, work at sites on learning, and manage their learning process through collaboration in learning communities. Corequisite: HOD 4950, 4951, 4953 [3]

HOD 4953. Analysis and Contribution. [Formerly HOD 2930] Students use methods from human centered design to analyze key factors impacting organization and develop a project-centered contribution to capstone site. Corequisite: HOD 4950, 4951, 4952 [3]

HOD 4960. Honors Capstone Internship. [Formerly HOD 2940] Students admitted to the Human and Organizational Development Honors Program may complete a capstone internship. [3]

HOD 4978. Senior Thesis. [Formerly HOD 2960] Senior Thesis [3]

HOD 4980. Human and Organizational Development Honors Seminar. [Formerly HOD 2990] Open to students majoring in human and organizational development who are admitted to the Honors Program. [3]

HOD 4987. Human and Organizational Development Honors Seminar. Open to students majoring in human and organizational development who are admitted to the Honors Program. Course carries writing requirement credit for Peabody students. [3]

Community Development and Leadership

HODC 3202. Community Development Theory. [Formerly HOD 2600] This is a core course in the Community Leadership and Development (CLD) track of the HOD undergraduate program. It is designed to provide a general introduction to the field of community development (CD) by examining appropriate theoretical perspectives. Ecological theory, critical theory, and theories of democracy will be studied for their application to community development issues. The theoretical perspectives examined in the course will also be linked to the diverse fields which inform community development, such as community psychology, sociology, geography, anthropology, education, and planning. Additionally, the course will provide students a more in-depth understanding of particular community development issues by exploring how alternative theoretical perspectives interpret several important community development phenomena. The course will prepare students to understand the theoretical orientations that underlie the dynamics of community development. [3]

HODC 3212. Community Development Organizations and Policies. [Formerly HOD 2610] Introduction to the practice of community development (CD), including analysis of, and experience with, CD issues, organizations, and policies. Prepares students to work with public or community agency staff, administrators, planners, policy-makers, or community organizers and leaders, who require analysis and recommendations on particular community issues. Students may also develop experience as part of a research, intervention, or policy development team. The course also focuses on ways ordinary people can become involved in improving their own neighborhoods, communities, and city. [3]

HODC 3222. Action Research and Program Evaluation. [Formerly HOD 2620] This is a specialty core requirement for the Community Leadership and Development (CLD) track in the Human and Organizational Development program. Course teaches policy-relevant field research methods in the context of action science. Students do an actual research project for a client organization and prepare a report with recommendations for policy and action. Students get experience in the conduct of the research as a team of a fictitious consulting organization. [3]

HODC 3232. Ethics for Human Development Professionals. [Formerly HOD 2280] (Also listed as HOD 5100 for professional students) Normative evaluation of ethical issues in serving human need. Conflicting values within moral dilemmas will be examined from a variety of theoretical perspectives and practical criteria. Case studies of moral issues confronting the individual, the family, service organizations, and the general public will be reviewed. [3]

HODC 3262. Social Entrepreneurship: Principles and Application. This course explores the idea and practice of "Social Enterprise", an emerging field where new types of organizational models are leveraging business and markets to address important social issues and unmet needs. The complexity of social issues in the 21st century often necessitates innovative, cross-sector, interdisciplinary solutions and organizational forms. Social Enterprise has emerged as one such model with great promise. This course is designed to provide broad exposure to the activity and key issues in the social enterprise sector, as well as a more specific, hands-on learning through projects, case studies and speakers. [3]

HODC 3312. Procedures in Transition to Adult Life. [Formerly HOD 2640] (Also listed as SPEDS 3312) Overview of history, legislation, and practice in the areas of community and employment integration for persons with disabilities. Emphasis on various strategies for promoting a successful transition from school to life. Students are required to develop instructional plans for integration within the community. Students will apply their skills in community or classroom settings. [3]

HODC 3313. Practicum: Transition to Adult Life. [Formerly HOD 2641] Field-based application of correlated course content to instructional strategies. Assessing, planning, implementing, and evaluating instructional procedures for community and employment integration. Corequisite: HODC 3312. [1]

HODC 3322. Religious and Spiritual Organizations. [Formerly HOD 2650] The class focuses on traditional and less studied religious and spiritual organizations and compares and contrasts their features, goals, structures, leaders, and personnel with secular organizations such as businesses. Information is also provided about how religious and/or spiritual features are being incorporated in a variety of organizational settings. [3]

HODC 3332. High Poverty Youth: Improving Outcomes. [Formerly HOD 2665] (Also listed as SPED 3332) Youth from high poverty backgrounds may be at risk for outcomes that include academic failure, school dropout, drug abuse, unemployment, or incarceration. Students will be working with schools and community agencies in Nashville to improve outcomes for youth living in high poverty neighborhoods. There will be class meetings as well as ongoing service-learning field experiences. Fieldwork will include mentoring, tutoring, or providing job readiness training to youth in neighborhood community centers or students' high schools. [3]

HODC 3342. Introduction to Community Psychology. [Formerly HOD 2670] Theory, research, and action in community psychology. History of mental health care; ecological theories of community, stress, coping, and social support; deviance labeling; community assessment strategies; prevention, empowerment, and community and organizational change programs; societal-level intervention policies. [3]

HODC 3352. Philanthropy and Social Problem Solving. [Formerly HOD 3890] This course provides an opportunity to engage in the practice of philanthropy, while learning about charitable giving/fundraising, social problem-solving, and the non-profit sector. The semester will be

divided into four sections: I. Problem identification; II. Approaches to change; III. Evaluating organizational effectiveness/impact and fit with theories of change; and IV. Decision making. Prerequisite: students must have taken courses in group processes (HOD 1300 or equivalent), organizations (HOD 2100 or equivalent), and systematic inquiry/research methods (HOD 2500 or equivalent), so that they are prepared to work in teams and to analyze both social problems and the organizations that aim to deal with them. [3]

HODC 3650. Community Leadership and Development Seminar. [Formerly HOD 2680] Exploration of selected topics related to the community leadership and development track of the Human and Organizational Development Program. May be repeated for credit with change of topic. [3]

HODC 3850. Independent Study in Community Leadership and Development. [Formerly HOD 2986] Individual programs of reading or the conduct of research studies in community leadership and development. Consent of supervising faculty member required. May be repeated. [1-3]

HODC 3870. Practicum in Community Leadership and Development. [Formerly HOD 2060] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

HODC 3890. Special Topics in Community Leadership and Development. [Formerly HOD 2690] Exploration of special issues on topics related to community leadership and development. May be repeated for credit with change of topic. [1-3]

Education Policy

HODE 3205. Education Policy Analysis Methods. [Formerly HOD 2800] How should the government choose among options to address the country's education problems? The main goal of this course is to introduce students to the concepts, methods, and tools useful in performing policy analysis in general, and to give students practice applying the policy analysis methods to real-world educational policy issues including school vouchers, using measures of teacher value-added, financing higher education, and the importance of resources for schooling and student achievement. Prerequisite: HOD 2700 or PSCI 1100. [3]

HODE 3215. Education and Public Policy. [Formerly HOD 2810] The course explores contemporary social, philosophical, and political dimensions of education policy, including issues related to civic engagement, equity and school organization, and the ecology of schooling. Course readings and discussions will involve fundamental questions about the relationship between schools and society: What is the purpose of American public education? How do policy values, including equity and excellence, social justice and accountability, shape education policy? How is education policy related to social and economic outcomes and opportunities? Prerequisite: HOD 2700 or PSCI 1100. [3]

HODE 3225. Introduction to Public Finance of Education. [Formerly HOD 2820] In this course, we first provide a foundation of knowledge for the economics of the public sector. In this part of the course, we will discuss the appropriate role of government activity in a market economy as well as other behavioral consequences of government policy from the perspective of the consumers, the policymakers, regulators, and general taxpayers. After establishing a better understanding of the economics of the public sector, we will examine economic models to explain real world government policymaking with a specific focus on education policy, including the rationale and mechanisms of funding education as well other important policy issues such as the provision of early childhood education, teacher labor markets, and accountability and school choice programs. [3]

HODE 3315. State and Local Government. [Formerly HOD 2850] Examines the operation of state and local governments within the American federal system. Students will have met expectations for the course when they are able to express well their understanding of how American state and local governments serve the interests of their residents within a system that is highly charged politically. Prerequisite: HOD 2700 or PSCI 1100. [3]

HODE 3650. Seminars in Education Policy. [Formerly HOD 2880] Exploration of special issues related to the education policy track of the Human and Organizational Development Program. May be repeated for credit with change of topic. [3]

HODE 3850. Independent Study in Education Policy. [Formerly HOD 2988] Individual Programs of reading or the conduct of research studies in education policy. Consent of supervising faculty member required. May be repeated. [1-3]

HODE 3870. Practicum in Education Policy. [Formerly HOD 2080] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

HODE 3890. Special Topics in Education Policy. [Formerly HOD 2890] Exploration of selected topics related to education policy. May be repeated for credit with change of topic. [1-3]

Health and Human Services

HODH 3201. Introduction to Human Services. Formerly HOD 2500] This course is a comprehensive and realistic survey of the diverse and dynamic field of human services. Students will examine: 1) significant historical developments; 2) populations served; 3) social welfare/poverty theories; 4) career opportunities; and 5) controversial and ethical issues. The course will emphasize special tasks and activities that are performed by the contemporary human service worker. [3]

HODH 3211. Introduction to Counseling. [Formerly HOD 2505] An overview of the counseling profession: theories, techniques, settings, and specialty areas. In addition to lectures and class discussions, the course includes an experiential component designed to increase students' listening and responding skills. By the end of the course, students will have a clear understanding of what being a counselor entails. [3]

HODH 3221. Health Service Delivery to Diverse Populations. [Formerly HOD 2510] This course focuses on the study of value systems of diverse groups, as well as variables related to gender, age, lifestyle, religion, social class, race, geography, and developmental state, and how these relate to health status and health service needs. This course provides students with a basic knowledge and understanding of diversity so that they may be more effective in serving the needs of all people. Transportation class fee: \$50.00 [3]

HODH 3231. Introduction to Health Services. [Formerly HOD 2525] This course will focus on the evolution of the U.S. health care system, as well as on the evolution of health care systems in diverse environments from around the globe. The content of the course focuses on the nature and dynamics of the macro health system environments and the design and function of organizational models in those environments. Particular attention will be paid to contemporary health service organizational models, such as managed care, integrated delivery systems, and physician-hospital organizations. Topics include education and training of health care professionals, the role of health care providers, public, private, and voluntary agencies, and the interests of major stake holders. [3]

HODH 3241. Health Policy. [Formerly HOD 2535] This course presents broad perspectives for understanding health policy within historical, political, and economic contexts. Lectures and assignments will primarily focus on health policy in the United States with a particular emphasis on the Tennessee State Legislature and Metropolitan Davidson County. Opportunities are available for application to national and international issues. Learners will be provided with a foundation from which to base their work, including an overview of the U. S. health care system and public health infrastructure, as well as a framework for conducting policy analyses. [3]

HODH 3311. Introduction to Health Promotion. [Formerly HOD 2530] This course is designed to enhance the student's understanding of health promotion concepts that relate directly to improved lifestyle behavior change and disease risk reduction. In addition, health promotion program development, program management, and program initiatives in a variety of settings will be addressed. [3]

HODH 3321. Introduction to Sports Medicine. [Formerly HOD 2540] Current topics in sports medicine, with an emphasis on prevention, management, and rehabilitation, and administrative aspects of sports medicine. [3] (Not currently offered)

HODH 3331. Managing Health Care Organizations. [Formerly HOD 2550] This is an applied course which combines theoretical knowledge with professional learning experiences, such as case studies, guest lectures, films, management development exercises, and group projects. This course provides a conceptual review of basic managerial functions such as 1) planning, 2) organizing, 3) controlling, 4) staffing, and 5) influencing. The course addresses related managerial activities such as communication, decision making, and legal and legislative issues. Prerequisite: HODH 3201 or HODH 3231. [3]

HODH 3650. Health and Human Services Seminar. [Formerly HOD 2580] Exploration of special issues related to the Health and Human Services track of the Human and Organizational Development Program. May be repeated for credit with change of topic. [3]

HODH 3850. Independent Study in Health and Human Services. [Formerly HOD 2985] Individual programs of reading or the conduct of research studies in Health and Human Services. Consent of supervising faculty member required. May be repeated. [1-3]

HODH 3870. Practicum in Health and Human Services. [Formerly HOD 2050] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

HODH 3890. Special Topics in Health and Human Services. [Formerly HOD 2590] Exploration of selected topics related to health and human services. May be repeated for credit with change of topic. [1-3]

International Leadership and Policy

HODI 3200. Global Dimensions of Community Development. [Formerly HOD 2400] The globalization process induces new forms of human organization and transforms existing organizations at the community, national, and international levels. This course provides an understanding of the nature, functioning, and development of organizations affected by globalization in societies different from our own and as they relate to multilateral or global institutions that span different social and cultural settings. To do this, the course explores organizations from a comparative perspective, using the analytical framework of human ecology, in terms of differential access to economic and other productive assets, education and information, security and the rule of law, social capital and cultural identity. [3]

HODI 3210. Leadership and Change in International Organizations. [Formerly HOD 2410] This course uses an interdisciplinary case study approach to investigate organizational challenges associated with today's international environment. Students examine the impact of culture, politics, and policy, and other international phenomena such as exchange rates, trade, and capital markets on organizational leadership, structure, and performance. Students also explore various dilemmas that confront decision-makers in international organizations as they attempt to reconcile institutional objectives, individual preferences, and varying cultural norms. [3]

HODI 3220. International Organizations and Economic Development. [Formerly HOD 2420] The number of international organizations has proliferated since World War II, and their functions have diversified. Some are altruistic. Others are regulatory. Some serve as forums for debate, others as instruments for military action or enforcement of international agreements in such diverse fields as health, labor, agriculture, human rights, environment, culture, and trade. This course addresses how these organizations are financed, how they are governed, and how they create and manage political controversy. It covers their legal mandates and structure, seeks to develop awareness of issues of human capital and the World Bank, addresses the controversies and debates over globalization and the role of international organizations in the international regulatory environment, and assesses the future of such organizations in an increasingly interdependent world. [3]

HODI 3230. Education and Economic Development. [Formerly HOD 2430] This course reviews the history and application of human capital theory. It provides students with examples of applications in economic development policy. It gives students practice in applying common statistical models. It exposes students to current debates in education policy in the World Bank and other international organizations which result from those models. [3]

HODI 3240. Effectiveness in International For-Profit Organizations. [Formerly HOD 2470] Intercultural understandings and skills are key in today's job market, due to fast-growing opportunities and challenges in international, multinational and global businesses. In this course students will, through a variety of methodologies, explore the current trends of exploding world trade, emerging nations, competition for talent and resources, and the impact of technology and changing demographics. Additionally, students will develop skills and understandings in working with cultures, managing cross-cultural teams, and the ins and outs of working abroad. [3]

HODI 3250. Building Knowledge Economics in Asia. [Formerly HOD 2450] This course focuses on the challenges and opportunities faced by the Asia-Pacific Region in making the transition to knowledge-based economies. Topics cover global, regional, and country-specific policies and initiatives aimed at building the four pillars of the Knowledge Economy (as defined by the World Bank): economic incentive and institutional regime, education, innovation, and information and communications technologies. This course is intended for advanced undergraduate students interested in gaining a deeper understanding of the transformational changes in the vast and diverse region. [3]

HODI 3260. Education in the Asia-Pacific Region: Development, Reform, and Innovation. [Formerly HOD 2445] This course focuses on an in-depth analysis of current developments in education and schooling in the vast and diverse Asia-Pacific Region. Students will examine perspectives from educational researchers, policy makers and practitioners on the major issues, concerns and prospects regarding educational developments in the region. [3]

HODI 3270. Global Sustainable Development. This interdisciplinary course will help students to develop a capacity to analyze society-environment relations across spacial scales (from local to the global) using approaches from multiple academic disciplines and professional fields. The course's dual focus on analytical approaches and environmental objects (rather than a typical emphasis on problems) underscores the fact that today's concerned citizens and professionals must be able to analyze complex society-environmental relations from multiple perspectives and at multiple scales. Sustainability demands insights and methods from education, the social sciences, business and organizational studies, the natural sciences, and more. [3]

HODI 3650. International Leadership and Development Seminar. [Formerly HOD 2480] Exploration of special issues related to the international leadership and development track of the Human and Organizational Development Program. May be repeated for credit with change of topic. [3]

HODI 3850. Independent Study in International Leadership and Development. [Formerly HOD 2984] Individual programs of reading or the conduct of research in international leadership and development. Consent of supervising faculty member required. May be repeated. [1-3]

HODI 3870. Practicum in International Leadership and Development. [Formerly HOD 2040] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

HODI 3875. Field School in Intercultural Education. [Formerly HOD 2460] This course takes place in various sites over a 10-week period in the summer session. It provides training in community field research and analysis techniques directed to human, social, and civic development issues. [3]

HODI 3890. Special Topics in International Leadership and Development. [Formerly HOD 2490] Exploration of special topics related to international leadership and development. May be repeated for credit with change of topic. [1-3]

Leadership and Organizational Effectiveness

HODL 3204. Leadership Theory and Practice. [Formerly HOD 2700] A systematic study of the formal theories and models of the leadership process and the research supporting and challenging them. Students will complete a wide range of leadership self-assessments; design a leadership self-development plan; and participate in individual and group problem solving, decision making, conflict resolution, and performance appraisal simulations and case studies focusing on personal and organizational effectiveness. Prerequisite: HOD 2100. [3]

HODL 3224. Analyzing Organizational Effectiveness. [Formerly HOD 2715] Effective leaders are able to analyze internal results and external trends in order to make effective decisions. Students will gain first-hand knowledge of the financial and strategic issues critical to effective decision-making through a mix of lectures, case studies and one problem-based learning module. The primary focus will be on the relevant critical thinking skills such as: identifying relevant decision criteria, interpreting trends in the underlying data (both financial and operational), and communicating that analysis to executives in a manner that can be readily digested. [3]

HODL 3234. Advanced Organizational Theory. [Formerly HOD 2720] A comprehensive study of current theories and applied research in organizational effectiveness. Emphasis is on the principles and practices of organizational restructuring, organizational development and planned changes, systems and processes, self-managed teams, and Total Quality. Experiential learning through simulations and field work will reinforce systematic inquiry, strategic planning, and applied organizational assessment skills. Prerequisite: HOD 2100. [3]

HODL 3244. Introduction to Human Resource Development. [Formerly HOD 2730] An introduction to the theory and practice of human resource development (design and implementation of training in corporate or human service organizations). Special emphasis on roles played by HRD professionals and concepts and skills needed for entry into the profession. [3]

HODL 3254. Human Resource Management. [Formerly HOD 2740] A comprehensive survey of human resource management theory, procedures, and practices, with emphasis on the organizational leader's role and responsibilities for recruiting and selection, placement and career development, employee relations, labor relations, performance appraisal, compensation and benefits, workplace ethics, equal employment opportunity, safety and health, legislation and workplace regulations, development of personnel policies and practices, and the techniques of strategic human resource planning. [3]

HODL 3264. Evidence-based Practice in Organizations. [Formerly HOD 2745] Accessing and using published research in solving organizational and social problems is a cornerstone of movements in management, education, medicine and a range of other fields. Using evidence from academic research has even become part of the definition of ethical practice in many of these fields. As a result, identifying and appraising research studies that might be used to solve individual, team and organizational problems has become a critical skill for practitioners. From this research, practitioners must be prepared to create actionable interventions and to persuade others to adopt them. Prerequisite: HOD 2100 (concurrent enrollment allowed) [3]

HODL 3274. Managing Organizational Change. [Formerly HOD 2750] This course focuses on organizational development philosophy and practices of planned change, and the theory and techniques of organizational consulting. Students will participate in simulations and actual organizational development interventions. Prerequisite: HODL 3204 or HODL 3234. [3]

HODL 3314. Strategic Planning and Project Management. [Formerly HOD 2755] This advanced seminar and workshop-based course focuses on the key organizational processes of strategic planning and project management. Building on prior instruction in leadership and organizational theory and practices, students will complete a critical analysis of strategic leadership theory and models of organizational planning. Activities include evaluation of internal and external factors

impacting on planning; participation in strategic planning and project management simulations; evaluation of the performance of selected strategic leaders as planners; and practice with key planning tools and technologies. [3]

HODL 3324. Executive Leadership. [Formerly HOD 2770] This course introduces students to concepts of leadership involved in various social, political, and corporate domains. Course content relies on biographies of renowned leaders to illustrate principles of executive leadership. [3]

HODL 3334. Challenges of Leadership. [Formerly HOD 2710] This course is designed as an extension of the study of leadership theory and practices begun in HODL 3204. Provides opportunities to investigate leadership concepts introduced in HODL 3204 in more depth. Prerequisite: HODL 3204. [3]

HODL 3650. Leadership and Organizational Effectiveness Seminar. [Formerly HOD 2780] Exploration of selected topics related to the leadership and organizational effectiveness track of the Human and Organizational Development Program. May be repeated for credit with change of topic. [3]

HODL 3850. Independent Study in Leadership and Organizational Effectiveness. [Formerly HOD 2987] Individual Programs of readings or the conduct of research studies in leadership and organizational effectiveness. Consent of supervising faculty member required. May be repeated. [1-3]

HODL 3870. Practicum in Leadership and Organizational Effectiveness. [Formerly HOD 2070] An intensive practicum experience. Three contact hours per week required for each credit hour. [1-3]

HODL 3890. Special Topics in Leadership and Organizational Effectiveness. [Formerly HOD 2790] Exploration of selected topics related to the leadership and organizational effectiveness track of the Human and Organizational Development Program. May be repeated for credit with change of topic. [3]

Military Science—Peabody

MS-PC 1210. Leadership and Personal Development. [Formerly MS-PC 111] (Formerly MS 111) Leadership is one of the most compelling topics of our time, and might be one of the most important attributes for effectiveness in all levels of human endeavor. The success of one of the most admired and respected institutions in our country, the military is founded upon the understanding and effective application of leadership, and the development of leaders. This course introduces students to the personal challenges and competencies that are critical to effective leadership. The focus is on developing basic knowledge and comprehension of leadership attributes and core leader competencies in a universal setting and exploring potential applications of these principles and practices at Vanderbilt, in the military, and in the corporate world. [1]

MS-PC 1210L. Leadership and Personal Development Lab. [Formerly MS-PC 111A and MS 111A] Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations. Within the military science curriculum, this process is called the Leadership Development Program (LDP), modeled after the principles spelled out in Field Manual 22-100, Army Leadership, and standardized both on campus and Leadership Development and Assessment Course (LDAC) environments. The flexible methodology of LDP accommodates personalized, individual development at all levels of proficiency throughout the officer educational experience, from program entry to commissioning. The LDP includes basic leadership training, periodic assessment and counseling at both team and individual levels by experience observers. Trends and deficiencies are identified and addressed with retraining and reassessment in a continuous cycle. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. Student performance in leadership

roles is assessed and notable strengths and weaknesses are identified. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

MS-PC 1230. Leadership and Personal Development II. [Formerly MS-PC 113] (Formerly MS 113) What motivates others to follow a person is intriguing, inspiring and alluring. Through routine observation, we learn from leaders regardless of the setting (military, business, education, etc.) This course provides an overview of leadership fundamentals such as setting direction, problem-solving, listening and providing feedback. You will explore dimensions of leadership, values, attributes, skills, and actions in a military context through practical, hands-on, and interactive exercises. [1]

MS-PC 1230L. Leadership and Personal Development II Lab. [Formerly MS-PC 113A] (Formerly MS 113a) Leader development is a continuous process of training, assessment and feedback with the goal of instilling and enhancing desirable behavior in individuals and organizations, this process is called the Leadership Development Program. Effective leader development is progressive, building on lessons learned and maximizing individual potential. This course introduces students to the leadership development process by providing structured leadership opportunities in a variety of training settings. A plan for improvement is discussed in detail during one-on-one counseling sessions. [1]

MS-PC 2150. Foundations of Leadership. [Formerly MS-PC 150] (Formerly MS 151) This course introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for future commissioned Army officers. The class is broken down into five key skill development areas: 1) values and ethics, 2) personal development, 3) officership, 4) leadership and, 5) tactics and techniques. The class emphasizes individual leadership values and characteristics with a focus on Leadership Theory and Interpersonal Communications, Army Values, Troop Leading Procedures, Problem Solving, and Team Building in a military environment. [2]

MS-PC 2150L. Foundations of Leadership Lab. [Formerly MS-PC 150A] (Formerly MS 151) This lab builds upon the classroom topics in MS-PC 2150 and introduces the process of understanding and defining leaders in order to develop leadership skills appropriate for the future commissioned officers. The lab is broken down into five key skill development areas: 1) leadership, 2) values and ethics, 3) personal development, 4) professional Officership, and 5) various tactics, techniques, and procedures. The lab emphasizes individual leadership values and characteristics with a focus on Leadership Theory and Interpersonal Communications, Army Values, Troop Leading Procedures, Problem Solving, and Team Building in a military environment. [1]

MS-PC 2160. Foundations of Tactical Leadership. [Formerly MS-PC 152] This course builds upon MS-PC 2150. The course is broken down into five key skill development levels: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. This class will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [2]

MS-PC 2160L. Foundations of Tactical Leadership Lab. [Formerly MSPC 152A] This course builds upon MS-PC 2150 and 2150L. The lab is broken down into five key skill development levels: 1) leadership, 2) values and ethics, 3) personal development, 4) professional officership, and 5) various tactics, techniques, and procedures. This class will focus on individual leadership development where the student begins to plan, organize, and lead small teams and groups in situational training exercises. Students begin to apply leadership skills at the smallest unit level. [1]

MS-PC 3110. Leadership and Problem Solving. [Formerly MS 211] This course builds upon your skills developed in MS-PC 2160 (1520), and continues to develop leadership, Officership skills, self-awareness, and critical thinking skills through challenging scenarios related to small-unit tactical operations. Cadets receive systematic and specific

feedback on their leadership values, attributes, skills, and actions. Prerequisite: MS-PC 1210 (111), 1230 (113), 2150 (150), and 2160 (152) [3]

MS-PC 3120. Applied Team Leadership. [Formerly MS-PC 212] (Formerly MS 212) Challenging scenarios related to small-unit tactical operations are used to develop self-awareness and critical thinking skills. Cadets receive systematic and specific feedback on their leadership values, attributes, skills, and actions. Open to ROTC Cadets only. Prerequisite: MS 211. [3]

MS-PC 4150. Leadership and Ethics. [Formerly MS-PC 251] (Formerly MS 212) Students develops proficiency in planning, executing, and assessing complex operations, functioning as a member of a staff, and providing leadership-performance feedback to subordinates. Students are given situational opportunities to assess risk, make sound ethical decisions, and provide coaching and mentoring to fellow ROTC Cadets. Open to ROTC Cadets only. [3]

MS-PC 4160. Leadership in a Complex World. [Formerly MS-PC 252] (Formerly MS 252) This course explores the dynamics of leading in the complex situations of current military operations in the contemporary operating environment. It introduces the concept of culture, its components, how culture influences human behavior, the impact of culturally influenced behavior on military operations, and how to analyze and apply cultural considerations in the planning and execution of military operations. Open to ROTC Cadets only. Prerequisite: MS-PC 4150. [3]

Naval Science—Peabody

NS-PC 2410. Leadership and Management. [Formerly NS 2410] This course presents a comprehensive study of organizational behavior and management with special emphasis on situational leadership in the military and civilian sectors and the development of your skills in organizational thinking and problem solving. You will explore a variety of leadership and management topics, including the classical theories of management, motivation and communication. FALL. [3]

NS-PC 4242. Leadership and Ethics. [Formerly NS-PC 2420] An exploration of major Western ethical philosophy in the development and application of leadership to enhance objective, sound and timely decision-making in the most challenging of environments. This course follows theoretical examination with case studies and practical application to emphasize the importance of ethical reasoning to leadership, and explores components of character and integrity in decision making. SPRING. [3]

Psychology and Human Development

Psychology and Human Development

PSY-PC 1001. Commons Seminar. [Formerly PSY-PC 1690] Commons seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

PSY-PC 1115. First-Year Seminar. [Formerly PSY-PC 1150] Topics of interest designed for first year students. Does not count in the writing requirement of the Liberal Education Core. [3]

PSY-PC 1117. First Year Writing Seminar. [Formerly PSY-PC 1157] Topics of interest for first year students. Courses are writing intensive and may be applied to the Peabody Liberal Education Core writing requirement. Repeatable with change of topic. [3]

PSY-PC 1205. Minds, Brains, Contexts, and Cultures. [Formerly PSY-PC 1200] An introduction to the cognitive studies major. Readings, lectures, and discussions are focused on thinking and understanding, especially as related to the brain, immediate context, and culture. These topics are considered from a variety of perspectives, including those taken from philosophy; literature; cognitive, social, and developmental psychology; sociology; psychiatry; and cultural anthropology. [3]

PSY-PC 1207. Minds, Brains, Contexts, and Cultures. [Formerly PSY-PC 1207] An introduction to the cognitive studies major. Readings, lectures, and discussions are focused on thinking and understanding, especially as related to the brain, immediate context, and culture. These topics are considered from a variety of perspectives, including those taken from philosophy; literature; cognitive, social, and developmental psychology; sociology, psychiatry; and cultural anthropology. May be applied toward the Peabody Liberal Education Core writing requirement. [3]

PSY-PC 1250. Developmental Psychology. [Formerly PSY-PC 1630] An overview of human development emphasizing the period from conception through adolescence. Course content includes research methods as well as in-depth coverage of selected topics in cognitive, social, emotional, and physical development. [3]

PSY-PC 2110. Introduction to Statistical Analysis. [Formerly PSY-PC 2101] Introductory course emphasizes selection, application, and interpretation of measures of relative frequency, location, dispersion, and association. Approaches to statistical inferences are emphasized. Prerequisite: proficiency in high school algebra. [3]

PSY-PC 2115. Advanced Introduction to Statistics. This calculus-based introductory statistics course emphasizes concepts and techniques in descriptive and inferential statistics. The orientation and data examples are taken from the social/behavioral sciences. Emphasis is placed on statistical theory, analysis, and interpretation of data, from both exploratory and confirmatory perspectives. Prerequisite: Math 1300 and 1301 or equivalent. [3]

PSY-PC 2120. Statistical Analysis. [Formerly PSY-PC 2102] Second course in statistics for undergraduates. Multifactor analysis of variance designs (including repeated measures), and goodness of fit and contingency analyses. Prerequisite: PSY-PC 2110 or PSY 2100. [3]

PSY-PC 2170. Experimental Research Methods in Child Development. [Formerly PSY-PC 2510] Focuses on how experimental methods are used to understand processes of child development. Through readings, class discussion, writing, and research experiences, the class considers excellent examples of classic and contemporary experimental studies of child development. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200 and PSY 2100 or PSY-PC 2110. [3]

PSY-PC 2200. Psychology of Thinking. [Formerly PSY-PC 1600] An in-depth exploration of theories and basic research concerning how young adults (i.e., college students) think, reason, and solve problems. Major topics include memory, categorization, reasoning, decision making, problem solving, and expertise. Prerequisite: PSY-PC 1205/1207, or 2250 or PSY 1200. [3]

PSY-PC 2230. Introduction to Educational Neuroscience. Educational neuroscience (ed neuro) is an emerging scientific field that investigates how the brain enables learning. Ed neuro applies the methods of cognitive neuroscience to questions such as what are the brain systems that allow us to read and do math? How do those systems relate to general systems such as attention and memory? This course will provide an introduction to these topics and more, exploring the basics of how the brain is structured, to how we can use neuroimaging methods to understanding the brain structures and processes that support learning. At the end of this course you will have a basic understanding of cognitive neuroscience methods and how they relate to educationally relevant cognitive domains. [3]

PSY-PC 2250. Cognitive Aspects of Human Development. [Formerly PSY-PC 1500] Introduction to research and theory in cognitive development. Emphasis on infancy and on early and middle childhood. Topics may include development of language, memory, sensation and perception, problem solving, concepts and theories, effects of media, sociocultural support for development, developmental disorders, and logical mathematical reasoning. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200. [3]

PSY-PC 2300. Social and Emotional Context of Cognition. [Formerly PSY-PC 1700] An exploration of such social factors as the individual's values, beliefs, and emotions and their contributions to the basic

cognitive processes involved in social perception, complex decision making, and problem solving. Topics include the social construction of perceived reality, attitude formation and change, heuristics and biases in social inference, and the role of emotion in coping and problem solving. [3]

PSY-PC 2400. Social and Personality Development. [Formerly PSY-PC 1750] An overview of basic concepts and current research in social and personality development. Specific topics include research methods, development of self, social cognition, achievement motivation, prosocial behavior, moral development, aggression, gender role development, family and cultural influences. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200. [3]

PSY-PC 2500. Infancy. [Formerly PSY-PC 2250] The behavior and physiological development of infants reflect a complex interaction between evolutionary history and genetics, prenatal environmental influences, and early postnatal experience. An overview of each of these topics is provided through classroom discussions and reading assignments focusing on recent empirical studies and major theoretical issues. Prerequisite: PSY-PC 1250. [3]

PSY-PC 2550. Adolescent Development. [Formerly PSY-PC 2320] Examines theory, research, and other literature pertinent to the development and education of adolescents (ages 12-19). Specific topics include: cognitive and social development; issues in identity, intimacy, autonomy, and sexuality; family-adolescent relationships; peer relationships; school achievement and organization; choices and decision making related to work. [3]

PSY-PC 2560. Theories of Developmental Psychology in Practice. We will study the grand theories of Developmental Psychology in-depth to provide a broad conceptual foundation for using Developmental Psychology in applied careers. Students will also gain familiarity with current Developmental Psychology concepts relevant to their intended professional practices. Through disciplined collaborative exchanges, students will learn about research advances and theoretical perspectives that are relevant to their fields, but not yet well known by practitioners. The term project assignments are designed to provide students the scholarly skills to not only keep up with current research in Developmental Psychology during their careers, but to seek out new domains of typical development research to learn from so that they can be leaders in their fields. For the final paper, students will write an original scholarly article to engage and inform practitioners. This closely supervised paper will provide students with individual practice using portable scholarly strategies to identify key developmental findings and communicate their importance to other practitioners. [3]

PSY-PC 2600. Educational Psychology. [Formerly PSY-PC 2310] Examines the applications of psychological theories and research to teaching and learning settings. Focuses on cognitive development, problem solving and critical thinking, learning theories, motivation, social contexts, individual differences, classroom issues, and evaluation issues. Prerequisite: PSY-PC 1205/1207 or 1250 or PSY 1200. [3]

PSY-PC 2700. Abnormal Child Psychology. This course will cover etiology, assessment, and treatment of psychological disorders (e.g., depression, anxiety, disruptive behavior disorders, autism spectrum disorders) emerging in childhood and adolescence. We will examine the development and treatment of psychopathology from an integrative perspective, including biological, cognitive, behavioral, cultural and environmental perspectives, and explore current issues and challenges in the field. Prerequisite: One course from PSY-PC 1205, 1207, 1250, or PSY 1200. [3]

PSY-PC 3130. Introduction to Formal Linguistics .This course is a general introduction to formal linguistics, the scientific study of human language. We will focus on the major core subfields of linguistics: morphology, phonetics, phonology, syntax, and semantics. This course also touches on questions of sociolinguistics, language variation, and language change. [3]

PSY-PC 3140. Psychology of Language. This course covers the basics of the psychology of language, understanding the cognitive

processes that underlie language production, language comprehension, and the use of language in society. Through understanding these processes, students will learn ways in which they can improve their own communication skills. [3]

PSY-PC 3150. Language Development. [Formerly PSY-PC 2000] An overview of language development with an emphasis on relevant research in linguistics, developmental psychology, and comparative psychology. Specific topics covered include research methods, speech perception, conversational competence, word learning, pragmatic development, and syntactic competence. The course is intended for students beyond the first year. [3]

PSY-PC 3160. Bilingualism and Second Language Learning. Learn the psychological and brain processes that underlie bilingualism and second language acquisition. Explore state of the art techniques in psychology such as brain imaging and eye-tracking as applied to multilingual speakers. Learn about bilingual language processing and learning. Develop the ability to critically evaluate the literature. Prerequisite: PSY-PC 3130 or 3140. [3]

PSY-PC 3170. Cognitive Science of Reading. Learn the relation of speech to reading in different writing systems. Understand the nature of visual word recognition. Explore how reading develops and is affected by dyslexia through experiments and formal models. Investigate the neural substrate of reading development and disability. Examine the causes of reading failure and how science can inform practice. Develop the ability to critically evaluate the literature and use it to apply to education. [3]

PSY-PC 3180. How We Talk. The course will examine how language is used in conversational settings. The course will focus on empirical studies of the psychology of language and will examine the cognitive, social, and contextual processes that guide every-day language use. Prerequisite: PSY-PC 3130 or 3140. [3]

PSY-PC 3190. Language and the Brain. Learn brain anatomy underlying language. Understand nonscientific methods used to study language such as neuroimaging and Lesion approaches. Explore brain basis of the lexical processing of nouns, verbs and morphology, and the comprehension of sentences. Investigate the neural substrate and behavioral manifestation of language disorders such as aphasia. Examine the cortical machinery of reading and writing, and their disorders such as dyslexia and dysgraphia. Develop the ability to critically evaluate the literature. [3]

PSY-PC 3200. Introduction to Clinical Psychology. [Formerly PSY-PC 2700] This course provides an overview of the science and practice of clinical psychology, with an emphasis on child and adolescent clinical psychology. Clinical research, psychological assessment, psychotherapy, and related issues will be discussed in class. Students examine the techniques used by clinical psychologists to assess and treat psychopathology, and research investigating the efficacy of these techniques. There is an emphasis on experiential learning in the class. Students will examine the science of clinical psychology by reviewing research from scientific journals on the effects of a specific type of psychotherapy for a specific psychological disorder. Previous courses in abnormal psychology and psychological research methods / statistics are highly recommended. [3]

PSY-PC 3210. Hospitalized Child. This course is designed for individuals who want to know more about the psychosocial needs of children, adolescents and families in health care settings and situations. Some of the specific topics covered in this course include: impact of illness and hospitalization on the family; social and developmental issues and how they interface with health care; normative development within the hospital; psychosocial roles of various healthcare team members; preparation of patients and families for health care experiences; utilizing play for therapeutic purposes; spirituality and its impact on the child and family's health care experience; the child who is dying; pediatric palliative and hospice care; an introduction to the field of child life; and an introduction to the field of pediatric / family advanced practice nursing. [3]

PSY-PC 3650. Advanced Topical Seminar. [Formerly PSY-PC 2100] An advanced seminar intended for juniors and seniors in which a particular topic within cognitive studies is considered in depth. Topics vary. May be repeated for credit with change of topic. Prerequisite:

PSY 1200 or PSY 1250 or PSY-PC 1205 or PSY-PC 1207 or PSY-PC 1250. This course is intended for students beyond the first year unless otherwise specified in the class schedule note. [3]

PSY-PC 3722. Psychometric Methods. [Formerly PSY-PC 2530] Covers the fundamental concepts of psychological measurement and testing, examines a sample of most important psychometric instruments in current use, provides observation of testing, and considers knowledge essential to making wise use of testing information in research and applied child development settings. Prerequisite: PSY-PC 1250 or 1205/1207 or PSY 1200 and PSY-PC 2110 or PSY 2100. [3]

PSY-PC 3724. Psychometrics. [Formerly PSY-PC 2540] The basic objectives of this course are for students to learn the fundamental concepts, methods, and principles of educational and psychological measurement. Particular attention will be devoted to reliability and validity issues underlying psychometric theory from original sources, and how psychometric theory relates to the assessment of individual differences or human psychological diversity more generally. Students should choose between PSY-PC 3722 and this course inasmuch as credit for both is not allowed. This course is more demanding in that students will be reading original sources; it is especially relevant to students seeking advanced training in the social sciences or research careers. Prerequisite: PSY-PC 2110 or PSY 2100 and PSY-PC 2120. [3]

PSY-PC 3727. Modern Robust Statistical Methods. [Formerly PSY-PC 2550] Covers modern statistical methods designed to handle violations of statistical assumptions that can compromise classic parametric procedures. More specifically, the student will learn about the classic assumptions of independence, normality, and equal variances that underlie many standard procedures, and become familiar with modern methods that perform vastly better than the classic procedures when assumptions are violated, yet offer few performance penalties under many realistic situations where assumptions are violated. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

PSY-PC 3730. Applied Latent Class and Mixture Modeling. [Formerly PSY-PC 2560] Often social science and educational researchers hypothesize that there are unobserved groups or latent classes of persons who show different behavioral patterns, or different patterns of change over time. This course covers mixture models - a statistical approach for assessing the number and size of classes, as well as class homogeneity or heterogeneity. Longitudinal mixture models are also used to allow classes to transition between states at different rates and/or to have different functional forms of change. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

PSY-PC 3732. Latent Growth Curve Modeling. [Formerly PSY-PC 2570] The analysis of longitudinal data (repeated measurements on the same people over time) is central for evaluating many theories in social science and educational research. This applied course will focus on one flexible and powerful approach for analyzing within individual change over time, and between individual differences in change: the latent growth curve model. Emphasis will be placed on applications to real data, interpretation of results, and attaining a solid understanding of the statistical model. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120 [3]

PSY-PC 3735. Correlation & Regression. [Formerly PSY-PC 2580] Covers modern correlation and regression techniques, including linear regression, multiple regression, polynomial regression, interaction effects, univariate and multivariate outlier detection, data transformation algorithms, handling of missing data, nonlinear regression, logistic regression, Poisson regression, variable selection procedures, and regression diagnostics and graphics. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

PSY-PC 3737. Structural Equation Modeling. This course introduces the basic principles of path analysis, confirmatory factor analysis, and latent variable structural modeling, which constitutes a powerful set of statistical tools for examining correlational, observational, and even experimental data in the social sciences. Computer techniques for conducting these analyses will also be taught: the LISREL program in particular, but AMOS will also be introduced. [3]

PSY-PC 3738. Introduction to Item Response Theory. [Formerly PSY-PC 2590] Students are introduced to the basic concepts of educational and psychological measurement, classical test theory (CTT), and item response theory (IRT). These concepts will be taught with practice by illustrating the construction of tests. Prerequisite: PSY-PC 2110 or PSY 2100 and PSY-PC 3722. [3]

PSY-PC 3743. Factor Analysis. [Formerly PSY-PC 2600] This course covers primarily Exploratory Factor Analysis (EFA), which is extensively used in psychology, education, medicine, and management to investigate the underlying dimensionality of unobserved constructs (e.g., intelligence, psychopathology). The theory behind factor analysis is covered alongside hands-on application to data, exposure to uses of factor analysis in the applied literature, and instruction in popular EFA software. Key topics include model specification, fit and evaluation, rotation methods, questionnaire development, sample size and power issues, and extensions to confirmatory factor models. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

PSY-PC 3746. Multivariate Statistics. [Formerly PSY-PC 2620] Provides an introduction to matrix algebra and a survey of the class parametric multivariate techniques that are the foundation of much of modern multivariate statistics. Emphasis is on techniques that have wide application in educational and social science research, such as exploratory factor analysis, structural equation modeling, confirmatory factor analysis, discriminate analysis, canonical correlation, and multivariate analysis of variance. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

PSY-PC 3749. Applied Nonparametric Statistics. [Formerly PSY-PC 2610] This course covers nonparametric statistical methods useful when the assumptions of ordinary parametric statistics are not met, and for developing custom statistical techniques useful when other methods do not exist. Coverage is given to distribution-free procedures, sign tests, contingency tables, median tests, chi-square and other goodness-of-fit tests, rank correlations, randomness tests, ordinal regression, Monte Carlo methods, resampling methods (bootstrap and jackknife), tests of independence, 1-sample, 2-sample, and k-sample methods, permutation tests, function smoothing, and splines. Emphasis is placed on underlying theory, application to data, and software. Prerequisite: PSY-PC 2110 or PSY 2100 (or equivalent), and PSY-PC 2120. [3]

PSY-PC 3751. Exploratory Data Analysis. Exploratory Data Analysis (EDA) is a modern statistical paradigm developed by John Turkey in the 1970's. EDA emphasizes fitting mathematical models to data as preliminary to the traditional hypothesis testing approach used in confirmatory analyses. Hallmarks of EDA include graphical methods, residual analysis, robust/resistant statistical methods, and data re-expression/transformation. But EDA is actually a whole philosophy of data analysis, and includes treatment of ethics and propriety in research. In this class we study EDA, as it has developed over the past four decades. We also do a great deal of EDA. An "EDA Portfolio" is developed by each student of different data analysis and graphical analysis projects. Included within the course is treatment of "big data" and data mining approaches, and also discussion of the current "replication crisis" and its emphasis on Questionable Research Practices (QRP's); EDA provides a certain type of prescriptive treatment of QRP's. Prerequisite: PSY-PC 2110 or PSY-PC 2120 or PSY-PC 3735 [3]

PSY-PC 3850. Independent Study. [Formerly PSY-PC 2970] Development of an independent study project by the individual student under the direction of a faculty sponsor. Intended primarily for juniors and seniors. Consent of both the faculty sponsor and the director of undergraduate studies is required. May be repeated for credit. [1-3]

PSY-PC 3860. Directed Research. [Formerly PSY-PC 2980] Participation in an empirical research project under the direction of a faculty sponsor. Consent of both the faculty sponsor and the director of undergraduate studies is required. May be repeated for credit. [1-3]

PSY-PC 3870. Field Work in Psychology for Undergraduates. [Formerly PSY-PC 2820] Offered to provide field experience appropriate to

the student's interests. Open only to students majoring in child development, child studies, or cognitive studies. May be repeated. Consent of instructor required. [1-3]

PSY-PC 3890. Special Topics in Psychology. [Formerly PSY-PC 2690] Advanced exploration of a psychological orientation to current issues. May be repeated with change of topic. [1-4]

PSY-PC 3980. Honors Seminar. [Formerly PSY-PC 2990] Open only to junior-level students in the Psychology and Human Development department honors program. [1-3]

PSY-PC 3981. Honors Seminar. [Formerly PSY-PC 2990] Open only to junior level-students in the Psychology and Human Development department honors program. [1-3]

PSY-PC 4998. Honors Thesis. [Formerly PSY-PC 2990] Open only to senior-level students in the Psychology and Human Development department honors program. [1-3]

PSY-PC 4999. Honor Thesis. [Formerly PSY-PC 2990] Open only to senior-level students in the Psychology and Human Development department honors program. [1-3]

Special Education

SPED 1001. Commons Seminar. [Formerly SPED 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

SPED 1115. Freshman Seminar. [Formerly SPED 1150] Selected Topics for first-year students [3]

SPED 1175. Freshmen Seminar. [Formerly SPED 1000] Provides students with an overview of the undergraduate program in special education. Faculty members from each program area share their experiences and research projects. Students complete a 15-hour service project with individuals with disabilities in the community. [1]

SPED 1210. Introduction to Exceptionality. [Formerly SPED 1010] Examines issues and trends in special education and overviews the characteristics of persons with disabilities. Covers essential issues and theories relating to special education and the development of exceptional persons with special attention to normal and atypical human development. Multi-cultural, humanistic, and legal issues are addressed. [3]

SPED 2110. Introduction to Teaching Students with Disabilities. [Formerly SPED 2010] This course consists of two major components. The first component focuses on special education law, writing IEPs, developing lesson plans, effective teaching behaviors, progress monitoring, and methods for grouping students. The second component provides an overview of instructional models that have empirical support for their effectiveness in teaching students with disabilities. [3]

SPED 2160. Cultural Diversity in American Education. [Formerly SPED 2060] (Also listed as EDUC 2160) Focuses on cultural diversity and the ways in which it has been defined and treated in the American educational system. An interdisciplinary perspective informs the course, with particular attention to history, sociology, psychology, anthropology, and educational literature. [3]

SPED 2310. Managing Academic and Social Behavior. [Formerly SPED 2110] This course is designed to prepare students to manage classroom behavior using behavioral principles. Definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress are presented. Emphasizes procedures for increasing academic and socially appropriate behavior through classroom activities. Students apply their skills in classroom settings. Prerequisite: SPED 1210. Corequisite: 1 hour of SPEDH 3871 or SPEDS 3871. [3]

SPED 3240. Attention Deficit/Hyperactivity Disorder: Educational Implications. [Formerly SPED 2140] This advanced undergraduate/ masters level course will first address the issues and controversies surrounding the definition, etiology, and identification of Attention Deficit/Hyperactivity Disorder (AD/HD). Potential relationships or related issues involving other child characteristics or difficulties, including child temperament, depression, bipolar disorder, Tourette's Syndrome, and oppositional-defiant disorder, will be addressed. A major focus of the course will be working successfully with children with AD/HD in the school and classroom. A collaborative, multimodal model that involved parents, general and special education teachers, school psychologists, and other professionals as appropriate will be emphasized. Integration of multiple forms of intervention will be explored, including affective, behavioral, cognitive, social, and medical approaches; discovering what works for children with AD/HD is an ongoing process that requires experience, persistence, and collaboration. [3]

SPED 3332. High Poverty Youth: Improving Outcomes. [Formerly SPED 2080] (Also listed as HOD 2665) Youth from high poverty backgrounds often are placed at risk for a host of unfavorable outcomes including academic failure, school dropout, drug abuse, unemployment, and incarceration. In this class, we will be working with schools and community agencies in Nashville to improve outcomes for youth living in high-poverty neighborhoods. We will have class meetings weekly as well as ongoing field-based experiences. Field work will include mentoring, tutoring, or providing job readiness training to youth in neighborhood community centers or in students' high schools. [3]

SPED 3770. Accommodating Academic Diversity in the Classroom. [Formerly SPED 2870] Explores the importance and difficulty of teaching heterogeneously grouped students in mainstream classrooms and offers specific instructional strategies for doing so effectively. Focuses explicitly and exclusively on methods to help classroom teachers instruct and manage the behavior of a broad range of students-students with and without disabilities at multiple points along the achievement continuum. [3]

SPED 3850. Independent Study in Special Education. [Formerly SPED 2960] Semi-independent study of selected topics in special education. May be repeated. Consent of instructor required. [1-3]

SPED 3890. Special Topics in Special Education. [Formerly SPED 2690] Study of selected topics or issues related to special education such as teaching culturally or linguistically diverse learners, accommodating academic diversity in classrooms, or augmentative communication techniques. May be repeated for credit with change in topic. [1-3]

SPED 3980. Honors Seminar in Special Education. [Formerly SPED 2990] This seminar is completed as part of the Honors Program in Special Education, which is designed to allow students experiences working with a faculty member on research activities. The course is taken during the junior year concurrent with engagement in research with a faculty mentor's team for at least five hours per week. During weekly meetings, students will be introduced to various research methodologies, read and discuss articles and studies that use a variety of research designs, examine and share their roles on a faculty mentor's team, and ultimately, complete and share an Honors Project at the end of the spring semester. Acceptance into the Honors Program and permission of the instructor are required. [0-1]

SPED 4950. Student Teaching Seminar. [Formerly SPED 2900] Students complete assignments and structured activities that demonstrate their ability to apply knowledge, skills, and dispositions acquired during the core courses and field-based experiences of the special education major. The weekly seminar discussion focuses on understanding situations and solving problems that naturally occur during the student teaching experience. A \$300.00 Teacher Performance Assessment fee is associated with this course. Must co-register for either SPED 4954 or 4951. [3]

SPED 4951. Student Teaching in Special Education. [Formerly SPED 2911] Observation, participation, and classroom teaching for undergraduate students in any area of exceptionality. Placements are dependent on license areas. Prerequisite: Admission to student teaching. Corequisite: SPED 4950. [9]

SPED 4954. Student Teaching in Special Education and Education. [Formerly SPED 2901] (Also listed as EDUC 4954) Observation, participation, and classroom teaching for undergraduate students in any area of education combined with any area of exceptionality. Placements are dependent on license and endorsement areas. Prerequisite: Admission to student teaching. Corequisite: SPED 4950. [9]

Interventionist/High Incidence/Modified

SPEDH 3308. Understanding Students with Severe and Persistent Academic and Behavior Difficulties. [Formerly SPED 2800] This course has three main components. The first component will focus on the cognitive, perceptual, language, academic, and social/emotional characteristics and needs of students with severe and persistent academic and behavior difficulties. The second component will focus on special education law and developing IEPs. The final component will focus on developing lesson plans and general strategies for teaching students with severe and persistent academic and behavior difficulties. Prerequisite: SPED 1210. [3]

SPEDH 3318. Assessment for Students with Severe and Persistent Academic and Behavior Difficulties. [Formerly SPED 2810] This course focuses on the diagnosis and evaluation of students with severe and persistent academic and behavior difficulties using a variety of developmentally appropriate curriculum based measurements, criterion-referenced, and norm-referenced tests in the academic and vocational subject areas. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives and instructional programming strategies. Specific considerations is given to the reporting of assessment information to parents, teachers and other support personnel to determine appropriate placement levels within the continuum of services. Prerequisite: SPED 1210. Corequisite: 1 hour of SPED 3871. [3]

SPEDH 3328. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties: K-8. [Formerly SPED 2820] This methodological course consists of two components. The first focuses on the possible causes for disabilities in the area of mathematics and assessment of those disabilities. The second emphasizes explicit teaching procedures, direct instruction, and instructional design principles that apply to teaching mathematics in grades K-8. Prerequisite: SPED 1210 and 3308. [3]

SPEDH 3338. Teaching Reading to Students with Severe and Persistent Academic and Behavior Difficulties. [Formerly SPED 2830] Presents empirically validated instructional procedures to address the reading deficits of students with severe and persistent academic and behavior difficulties. Integration of explicit teaching procedures, direct instruction, and instructional design principles that apply to a range of academic domains are emphasized. Proficiency in the development of assessment profiles, instructional lessons, monitoring of progress through curriculum-based measures and data-based decision making is required. Candidates apply skills in classroom settings. Prerequisite: SPED 1210 and 3308. Corequisite: 1 hour of SPED 3871. [3]

SPEDH 3348. Language and Learning. [Formerly SPED 2840] This course examines writing and language development, the written and language difficulties encountered by students with high incidence disabilities, assessment and instruction of writing and language difficulties, as well as cultural diversity and writing and language differences. [3]

SPEDH 3358. Advanced Reading Methods for Students with Severe and Persistent Academic and Behavior Difficulties. [Formerly SPED 2850] This course focuses on advanced methods of assessment and instruction methods related to teaching reading. Candidates in this course will gain competency in using formative assessments to identify students with severe and persistent reading difficulties, as well as expertise in and knowledge of teaching approaches and curricula for improving decoding, vocabulary, fluency, and comprehension abilities. Prerequisite: SPED 1210 and 3338. Corequisite: 1 hour of SPED 3871. [3]

SPEDH 3368. Teaching Middle School Students with Severe and Persistent Academic and Behavior Difficulties. This middle school

course for teaching students with severe and persistent academic and behavior difficulties has two components. The first focuses on teaching English Language Arts across the curriculum at the middle school, including reading literature and informational text, language development, writing, speaking, and listening. The second component focuses on skills needed for collaborating with other school personnel and preparing students to transition to high school. [3]

SPEDH 3378. Teaching High School Students with Severe and Persistent Academic and Behavior Difficulties. This is an introductory course in teaching students with severe and persistent academic and behavior problems at the high school setting. The first half of the course covers models of teaching special education at the secondary level, transition-related legislation, post-school outcomes of high school students with disabilities, and dropout prevention within a context of cultural diversity. The second half focuses on empirically-based secondary special education strategies, including academic/study skills and accommodations, social skills, self-determination, ITP development, and career education and employment. [3]

SPEDH 3388. Teaching Mathematics to Students with Severe and Persistent Academic and Behavior Difficulties 6-12. This mathematics methods course for teaching 6-12th grade students with severe and persistent academic and behavior difficulties consist of two major components. The first component focuses on the possible causes of math disabilities and assessment of math disabilities. The second component emphasizes instructional design principles, explicit teaching procedures, interventions, and mathematics pedagogy at the secondary level. [3]

SPEDH 3771. Practicum: Accommodating Academic Diversity in the Classroom. [Formerly SPED 2871] This practicum is designed to allow students to work with both special educators and general educators regarding the needs of students with disabilities. Emphasis is placed on accessing the general education curriculum. Corequisite: SPED 3770 or 3777. [5]

SPEDH 3777. School and Classroom Supports Teaching Students Academic Behavior Difficulties. [Formerly SPED 2877] This course focuses on practices to support teaching and learning of students with severe and persistent academic and behavior difficulties. Core topics include the following: (1) Effective classroom management to enhance appropriate behavior, prevent problem behavior, and support students at-risk for and with behavior difficulties; (2) Research, efficacy and models of co-teaching; (3) Collaboration with colleagues and families; (4) Technology use to support instruction and accessibility; and (5) Ethical professional behavior. [3]

SPEDH 3871. Field Work in Special Education for Mild/Moderate Disabilities. [Formerly SPED 2801] Field-based application of correlated course content to classroom strategies. Planning, implementation, and evaluating instructional procedures for students with mild to moderate disabilities. May be repeated. Prerequisite: SPED 1210 and SPED 2110. Fall semester corequisite: SPED 2310, SPEDH 3338 and 3348. Spring semester corequisite: SPEDH 3318, 3328, and 3368. [3]

Severe/Comprehensive

SPEDS 2120. Family Intervention. [Formerly SPED 2020] An overview of different approaches, current issues, and problems involved in working with and supporting families. Emphasis is placed on how a child with disabilities affects and is affected by parents, siblings, the extended family, and the community. Strategies for effective communication for the purpose of information sharing and collaborative planning with families are provided. [3]

SPEDS 2430. Introduction to Language and Communication. [Formerly SPED 2030] Overview of normal language development, psycholinguistic terminology and research, speech and language disorders and their remediation, and specific intervention procedures for the development of speech and language skills in children and youth. [3]

SPEDS 2450. Augmentative and Alternative Communication. [Formerly SPED 2050] This course is designed to provide an overview of the field of augmentative and alternative communication (AAC) for use

with young children and school-age children with severe disabilities. Specifically, the course will provide an overview of the theories that are important to the understanding of appropriate uses of AAC systems, and the course will provide information about the efficacy of these systems with students with severe disabilities. Topics will include guidelines for selecting, implementing, using, and monitoring the use of AAC systems. [3]

SPEDS 3300. Methods of Instruction for Students with Severe and Multiple Disabilities. [Formerly SPED 2300] Provides information on the nature and needs of individuals with severe disabilities and the roles of federal, state, and local agencies in providing services to this population. Emphasis is placed on strategies for the acquisition and generalized use of age appropriate functional skills in natural community-based settings. Methods for developing and implementing individualized programming across specialized curricular areas such as communicative, cognitive, functional academic, motor, domestic living/self-help, recreation/leisure, vocational and general community living skills. Must co-register for SPEDS 3871. [3]

SPEDS 3312. Procedures in Transition to Adult Life. [Formerly SPED 2340] (Also listed as HODC 3312) Overview of history, legislation, and practice in the areas of community and employment integration for persons with disabilities. Emphasis on various strategies for promoting a successful transition from school to life. Students are required to develop instructional plans for integration within the community. Students will apply their skills in community or classroom settings. Prerequisite: SPED 2310. Corequisite: SPEDS 3871. [3]

SPEDS 3330. Characteristics of Students with Severe and Multiple Disabilities. [Formerly SPED 2330] This course provides information on the history, nature, characteristics, and needs of students with exceptionalities. Neurological impairments resulting in motor dysfunction, sensory impairments, and the combination of these are discussed. Information is provided on the physical, medical, and educational management of students with severe, profound, and multiple disabilities in educational settings. Corequisite: SPEDS 3871. [3]

SPEDS 3350. Access to General Education and Teaching Functional Academics. [Formerly SPED 2350] The course provides in-depth information on teaching students with severe disabilities. Emphasis is on strategies for the acquisition and generalized use of age-appropriate functional skills in natural school and community-based settings. Methods for developing and implementing individualized programming across specialized curricular areas such as communicative, cognitive, functional academic, motor, domestic living/self-help, recreation/leisure, and general community living skills. Current research evidence to support effective practices is stressed. [3]

SPEDS 3600. Teaching Reading to Students with Severe Disabilities. This course will present empirically validated instructional procedures to address the academic deficits of students with severe disabilities across principle domains of reading instruction including oral language, concepts of print, phonological awareness, phonics, vocabulary, comprehension, writing, and content area literacy. Includes integration of explicit teaching procedures, direct instruction, and instructional design principles that apply to a range of academic domains. Proficiency in the development of assessment profiles, instructional lessons, monitoring of progress through curriculum-based measures and data-based decision making is required. Students will apply their skills in classroom settings. Prerequisite: SPED 1210 and SPEDS 3330. Corequisite: SPEDS 3300. [3]

SPEDS 3661. Fieldwork in Special Education: Severe Disabilities. Students will participate in field-work in special education, specifically in classrooms for students with severe exceptionalities and/or autism. Students will complete activities tied to a fieldwork in special education seminar. This course may be repeated. Corequisite: SPEDS 3667. Prerequisite SPED 3871 both fall and spring. [3]

SPEDS 3667. Seminar in Severe Disabilities Fieldwork. Seminar for undergraduate students related to their field-work in local classrooms with severe disabilities and/or autism. Students will complete various assignments and implement them in a classroom setting. This course

may be used to satisfy the Peabody College writing requirement. Prerequisite: SPED 1210, 2120, 2450, SPEDS 3300, 3330, 3312, 3350. Corequisite: SPEDS 3661. [3]

SPEDS 3871. Field Work in Special Education: Autism, Intellectual, and Multiple Disabilities. [Formerly SPED 2311] Field-based application of correlated course content to classroom strategies. Planning, implementation, and evaluating instructional procedures for students with severe disabilities. May be repeated. Prerequisite: SPED 1210, SPED 2110, SPED 2430. Fall semester corequisite: SPED 2310, and SPEDS 3330. Spring semester corequisite: SPED 2450, SPEDS 3312, and SPED 3328. [3]

Teaching and Learning

Education

EDUC 1001. Commons Seminar. [Formerly EDUC 1690] Commons Seminar, a 1-hour small seminar experience, open to first-year students. Students and faculty will collaboratively explore a specialized topic in depth in this university-wide seminar sponsored by The Ingram Commons. General Elective credit only. [1]

EDUC 1220. Society, the School, and the Teacher. [Formerly EDUC 1020] Introduces the relationship between society's goals and those of the school. Studies the community setting and the school, the social, political, and instructional organization of a school, and the roles and values of a teacher. Field experience. [3]

EDUC 2160. Cultural Diversity in American Education. [Formerly EDUC 2060] (Also listed as SPED 2060) Focuses on cultural diversity and the ways in which it has been defined and treated in the American educational system. An interdisciplinary perspective informs the course, with particular attention to history, sociology, psychology, anthropology, and educational literatures. [3]

EDUC 3114. Language and Literacy Learning in Young Children. [Formerly EDUC 2115] Examines sociocultural and cognitive theories of language learning, theoretical models of the reading and writing processes, and interconnections between reading, writing, speaking, and listening. Emphasizes patterns of reading and writing for children from birth to age 8 and relates these to features of learning environments. Observation and assessment strategies are introduced through an embedded field experience of six hours which requires working with preschool-age child in a school setting. [3]

EDUC 3115. Methods of Language and Literacy Instruction in Early Childhood. [Formerly EDUC 2117] This course introduces methods for structuring classrooms to teach and assess reading, writing, speaking, and listening as part of an integrated language arts program for children from birth through grade 4, with special emphasis on children from birth to age 8. Corequisite: EDUC 3116 [3]

EDUC 3116. Practicum in Teaching Early Childhood Reading and Language Arts. [Formerly EDUC 2116] Field experiences in a variety of early childhood centers or classroom settings designed to provide practical experience and reflection on the teaching of reading and the language arts. Corequisite: EDUC 3115. [1]

EDUC 3120. Children in Families and Schools. [Formerly EDUC 2120] Examines the cultural, social-political, historical, and collaborative influences of families and educational institutions on children's development and learning. Emphasis on understanding family-school connections and developing partnerships to foster maximum growth of children. [3]

EDUC 3212. Introduction to Reading Processes and Assessment. [Formerly EDUC 2430/2212] Develops an understanding of reading and of elementary students as readers. Examines theoretical models, approaches, and the development of reading in elementary classrooms. Candidates will investigate how children learn to read, explore assessments that reveal student understanding of reading, and apply this knowledge in scaffolding reading with individual students. Provides informal assessment and teaching experiences within a school setting. [3]

EDUC 3214. Theory and Methods of Reading Instruction in Elementary Schools. [Formerly EDUC 2215] Examines approaches, strategies, and methods for teaching reading in elementary classrooms with attention paid to philosophies and principles of instructional practice designed to individualize instruction and support literacy development. Discusses underlying concepts and theories pertaining to literacy instruction and relates these to classroom practice. Although grounded in the philosophy that reading and writing are not discrete entities, the course focuses on reading. Prerequisite: EDUC 3212; Corequisite: EDUC 3215 and EDUC 3216. [3]

EDUC 3215. Language Arts in Elementary Schools. [Formerly EDUC 2217] Examines the nature of language development in the elementary school years with attention paid to principles and practices for teaching English language arts, particularly related to writing instruction. Consideration of instructional practices designed to individualize instruction and support literacy development will occur. Prerequisite: EDUC 3212; Corequisite: EDUC 3214 and EDUC 3216. [3]

EDUC 3216. Practicum in Teaching Elementary Reading and Language Arts. [Formerly EDUC 2216] : Field experiences in a variety of elementary classroom settings designed to provide practical experience and reflection on the teaching of reading and the language arts. Prerequisite: EDUC 3212; Corequisite: EDUC 3214 and EDUC 3215. [1]

EDUC 3240. Practicum in Elementary Science and Social Studies. [Formerly EDUC 2210/2240] Field experiences in a variety of school, grade level, and instructional settings, designed to integrate and apply teaching skills developed in the elementary science and social studies methods courses. Corequisite: SCED 3240 and SSED 3240. [1]

EDUC 3270. Managing Instructional Settings. [Formerly EDUC 2270] Examines several planning and management philosophies and a variety of practices for use with early childhood and/or elementary school students. [2]

EDUC 3310. Classroom Ecology. [Formerly EDUC 2310] This course explores how teachers make design choices for an environment that creates optimal conditions for student learning. Design elements include social and cultural contexts of learning, social/emotional learning, motivations for learning, and appropriate assessments. This is an introductory general methods class. Students will take specific methods classes in their area of teaching. [3]

EDUC 3620. Social and Philosophical Aspects of Education. [Formerly EDUC 2920] Exploration of the interaction between contemporary social problems and various philosophies in relation to educational theory, policy, and practice. [3]

EDUC 3720. Principles for Teaching English Language Learner Students. [Formerly EDUC 2520] This course, specifically designed for non-ELL majors, provides an overview of theoretically and empirically supported practices concerning the education of English language learners (ELLs) in grades PreK-12. Topics include: the role of second language acquisition in academic achievement, instructional strategies for developing English listening, speaking, reading and writing while accessing the core curriculum, appropriate assessment of ELLs in the classroom, the importance of ELLs home language and culture, and ESL research and history relating to policies and programs affecting ELLs. Consideration of how to attain more equitable outcomes for ELLs through schooling is a major focus of this course. [3]

EDUC 3730. English Language Learner Educational Foundations. [Formerly EDUC 2530] This course focuses on understanding the processes of second language acquisition, learning, development, and individual, cognitive, and social factors that influence second language learning in North America (particularly in the United States). In addition, it examines the theoretical, historical, political, legal, and research bases for the education of students from linguistically and culturally diverse populations. Program models and the theoretical bases for these models are covered in this course. National policies and current issues relevant to the learning of English language learners are emphasized. Corequisite: 1 hour of EDUC 3731 [3]

EDUC 3731. Practicum for Teaching English Language Learners I. [Formerly EDUC 2571] A fieldbased practicum working with students who are English language learners. Experience will include use of students' native languages and/or ESL instructional components. Corequisite EDUC 3730. [1]

EDUC 3740. English Language Learner Methods and Materials. [Formerly EDUC 2540] This course focuses on bilingual (native language and ESL) curriculum development and instruction for students (preK-12) in a variety of language and program settings. Second-language instructional theory and practice, materials selection and development for LEP children, and bilingual and ESL literacy and content area instruction (mathematics, science, social studies, and English education) are covered. Frameworks for evaluating curriculum materials and their instructional recommendations for ELL students are provided. Corequisite: 1 hour of EDUC 3742. [3]

EDUC 3742. Practicum for Teaching English Language Learners II. [Formerly EDUC 2572] A field-based practicum working with students who are English language learners. Experience will include use of students' native languages and/or ESL instructional components. Corequisite EDUC 3740. [1]

EDUC 3750. Linguistics and Language Acquisition for English Language Learner Teachers. [Formerly EDUC 2550] This course focuses on the applying of theories of linguistics and second language acquisition to the teaching of English language learners. Topics covered include the structure of the English language, English as a system, language acquisition and development, language variation, and theories of second language acquisition. [3]

EDUC 3760. Assessment of English Language Learners. [Formerly EDUC 2560] This course focuses on the theoretical and practical aspects of language testing for second-language learners. Instruments used by educators to assess the language proficiency and academic achievement of linguistically diverse students are presented and demonstrated. The course examines the purposes and types of language tests in relation to theories of language use and language teaching goals; discusses testing practices and procedures related to language teaching and language research; and includes the planning, writing, and administration of tests, basic descriptive statistics, and test analysis. Rubrics for relating assessment information to instruction and program planning are developed within this course. Corequisite: 1 hour of EDUC 3763 [3]

EDUC 3763. Practicum for Teaching English Language Learners III. [Formerly EDUC 2573] A field-based practicum working with students who are English language learners. Experience will include use of students' native languages and/or ESL instructional components. Corequisite: EDUC 3760. [13]

EDUC 3770. Language Socialization and Variation. This course provides a sociocultural view of language development and use in the US. Specific topics covered include examination of components and characteristics of language structure as they relate to dialectal variation, discourse patterns and ways in which they relate to discourse differences among dialect groups. We will analyze the socio-political nature of language standards and "standard" usage and investigate ways in which teachers can integrate dialect diversity into the language arts classroom and reading instruction language. Prerequisite or co-requisite: EDUC 3750 or PSY-PC 3130 [3]

EDUC 3790. Qualitative Language Analysis. This Qualitative Language Analysis course introduces students to some of the characteristics and approaches to designing and conducting qualitative language research analysis. Students will gain experience in various qualitative analysis techniques for purposes of either carrying out a research project or designing courses and materials derived from the results of their analysis. Prerequisite: EDUC 3750. [3]

EDUC 3850. Independent Study in Education. [Formerly EDUC 2960] Semi-independent study on selected topics in education. Consent of instructor required. May be repeated. [1-3]

EDUC 3860. Honors Research in Education. [Formerly EDUC 2980] Individual programs of reading on the conduct of research studies in education. May be repeated. Consent of instructor required. [1-3]

EDUC 3861. Initial Fieldwork in Educational Studies. Field-based application of Education Studies course work, providing students an opportunity to integrate and apply theory and practice to learning in out-of-school settings. Students are placed in culturally diverse education settings and are given opportunities to engage in practitioner observations, learning design and implementation, and guided reflective practice. [3]

EDUC 3862. Advanced Fieldwork in Educational Studies. Advanced experience for Education Studies course work, providing students an opportunity to develop independent experience in out-of-school settings and to apply at an advanced level theory and practice to learning in out-of-school settings. Students are placed in culturally diverse education settings and are given opportunities to engage in practitioner observations, learning design and implementation, and guided reflective practice. [3]

EDUC 3871. Practicum in Secondary Education I. [Formerly EDUC 2340] Field experience in middle and secondary school settings. Designed for secondary education majors in their sophomore year. Corequisite: PSY-PC 2550 [1]

EDUC 3872. Practicum in Secondary Education II. [Formerly EDUC 2350] Field experience in middle and secondary school settings. Designed for secondary education majors in their junior year. [1]

EDUC 3890. Special Topics in Education. [Formerly EDUC 2690] Exploration of special issues on topics related to education. May be repeated for credit with change of topic. [1-3]

EDUC 4950. Capstone Fieldwork in Educational Studies. Capstone experience for Education Studies course work, providing students an opportunity to develop independent experience in out-of-school settings and to apply at an advanced level theory and practice to learning in out-of-school settings. Students are placed in culturally diverse education settings and are given opportunities to engage in practitioner observations, learning design and implementation, and guided reflective practice. Capstone experiences should include opportunities for students to develop, direct or implement learning opportunities with increasing independence from field partners. [6]

EDUC 4951. Student Teaching in Early Childhood. [Formerly EDUC 2702] Observation and teaching experience for students seeking PreK-3 licensure. Undergraduate credit only. Prerequisite: admission to student teaching. [9]

EDUC 4952. Student Teaching in the Elementary School. [Formerly EDUC 2701] Observation and teaching experience in elementary schools. Undergraduate credit only. Prerequisite: admission to student teaching. [9]

EDUC 4953. Student Teaching in the Secondary School. [Formerly EDUC 2703] Observation and teaching experience in secondary schools. Undergraduate credit only. Prerequisite: admission to student teaching. [9]

EDUC 4954. Student Teaching in Education and Special Education. [Formerly EDUC 2704] (Also listed as SPED 4954) Observation, participation, and classroom teaching for undergraduate students in any area of education combined with any area of exceptionality. Placements are dependent on license and endorsement areas. Prerequisite: Admission to student teaching. [9]

EDUC 4961. Student Teaching Seminar: Early Childhood. [Formerly EDUC 2291] Seminar to accompany EDUC 4951. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

EDUC 4962. Student Teaching Seminar: Elementary. [Formerly EDUC 2290] Seminar to accompany EDUC 4952. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

English Education

ENED 2200. Exploring Literature for Children. [Formerly ENED 2200] Explores characteristics of good literature for children ages birth to 12, authors and illustrators of the genre, and issues in the area of children's literature. [3]

ENED 2430. Fostering Language in Diverse Classrooms. [Formerly ENED 2030] Overview of language learning, emphasizing ages 3 - 8 and the role of teachers and parents in fostering growth. Variability associated with culture, income, home language and individual child characteristics is examined from developmental and sociolinguistic perspectives. Students examine language use and teaching as part of an 8 hour practicum in an early childhood classroom. [3]

ENED 3310. Language Study in the Secondary Classroom. [Formerly ENED 2280] Investigates various methods of approaching grammar, vocabulary spelling, semantics, and bi-dialectism in the English classroom. For teachers and prospective teachers of middle school and high school English. [3]

ENED 3340. Reading and Learning with Print and New Media. [Formerly ENED 2320] Studies print and technology-based approaches to improving reading and content area learning in grades 6-12 with a special emphasis on diverse learners and struggling readers. Drawing on research-based practice, students learn to design, enact, and assess effective reading and literacy instruction. [3]

ENED 3350. Literature, Popular Culture, and New Media. [Formerly ENED 2920] Examines a wide range of multigenre, multimodal, and digital texts appropriate for readers of middle school and high school age. Considers the influence of popular culture and digital technologies on young adult literature. Includes materials and texts for readers of various ability levels. [3]

ENED 3357. Literature, Pop Culture, and New Media. Considers the influence of popular culture and digital technologies on young adult literature and the ways in which societal critique, role of the media, and negotiating identity categories play out in those texts. Examines a wide range of Multigenre, multimodal, and digital fiction focused on various themes such as Real and Imagined Worlds: Gaming and Technology in Texts, Vampires, Zombies, Werewolves and Monsters: Imagining the Other, and Who am I? Race, Class, Gender, and Sexual Identity in Literature. [3]

ENED 3370. Teaching Literature and New Media in the Secondary School. [Formerly ENED 2370] Students study how pedagogy might be developed that connects traditional literature instruction with media popular cultural media. Methods and theories for reading and teaching short stories, poetry, and novels are juxtaposed and interwoven with methods and theories for reading and teaching web sites, comics, film, and other media. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: ENED 3371. [3]

ENED 3371. Practicum in Secondary Education III. [Formerly ENED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite: ENED 3370 [1]

ENED 3380. Teaching Writing in Secondary Schools. [Formerly ENED 2380] Designed to encourage student teachers to examine the complexities of teaching writing in middle and high school settings and to develop a theoretically sound methodology that will allow them to design meaningful, engaging, and thoughtful writing instruction. [3]

ENED 3400. Harry Potter and Children's Literature. Students will examine British Literature related to J. K. Rowling's novels. Students will be asked to relate what they learn from other children's literature to the characters, plot, and themes of the Harry Potter novels as well as the opportunity to perform a variety of critical analyses of a social/cultural phenomena with progressive young adult literature. Additionally, students will explore the film versions of all novels discussed to analyze and critique the adaptations. This is a weekend course that includes week-long travel to the United Kingdom where students will engage in the stories in an experiential journey of local U.K. sites, studios, and museums. [3]

ENED 3410. Literature of Social Transformation. Historical events, issues, and movements are often explored in literature for children and adolescents. The literature helps make history come alive. This class will focus on stories relating to the civil rights movement that led to social transformation the United States. In this weekend course, students will explore books written for children/young adults, discuss specific episodes of the movement where youth had great impact, and visit libraries, museums, and related sites. [3]

ENED 3850. Independent Study in English Education. [Formerly ENED 2960] Semi-independent study on selected topics in English education. Consent of supervising instructor required. May be repeated. [1-3]

ENED 3890. Special Topics in English Education. [Formerly ENED 2690] Exploration of special topics related to English education. May be repeated with change of topic. [1-3]

ENED 4963. Student Teaching Seminar: Secondary. [Formerly ENED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

Foreign Language Education

FLED 3850. Independent Study in Foreign Language Education. [Formerly FLED 2960] Semi-independent study on selected topics in foreign language education. May be repeated. Consent of instructor required. [1-3]

FLED 3890. Special Topics in Foreign Language Education. [Formerly FLED 2690] Exploration of special issues or topics related to foreign language education. May be repeated for credit with change of topic. [1-3]

Humanities Education

HMED 2250. Introduction to Arts Education. [Formerly HMED 2250] Acquaints the student with the philosophical and pedagogical base with which to develop competence in teaching the arts. [2]

HMED 3850. Independent Study in Humanities Education. [Formerly HMED 2960] Semi-independent study on selected topics in humanities education. May be repeated. Consent of faculty supervisor required. [1-3]

HMED 3890. Special Topics in Humanities Education. [Formerly HMED 2690] Explores special topics related to humanities education. May be repeated with change of topic. [1-3]

Math Education

MTED 2200. Mathematics for Elementary Teachers. [Formerly MTED 2200] This course is the first of a sequence designed for those students seeking elementary licensure with an emphasis on grades preK-3. The course deals with issues of both content and pedagogy that are relevant to these grades. The course is prerequisite to MTED 3250 and may be taken concurrent with MTED 3251. [3]

MTED 2300. Pedagogy Seminar. This pedagogy seminar accompanies a core course in the College of Arts and Science and examines the process of teaching and learning of that course content. Students enrolled in the core course lecture may elect to participate in this accompanying one credit pedagogy seminar. This optional seminar will be team-taught by the core course instructor and an education faculty member. [1]

MTED 3250. Teaching Mathematics in Elementary Schools. [Formerly MTED 2250] This course is the second in a sequence of courses designed for those students seeking elementary licensure with an emphasis on grades 2-5. This course deals with issues of both content and pedagogy that are relevant to these grades. This course may be taken concurrent with MTED 3251. Prerequisite: MTED 2200. [2]

MTED 3251. Practicum in Elementary Mathematics. [Formerly EDUC 2250/MTED 2251] Field experiences providing students an opportunity to integrate and apply teaching skills developed in the elementary

mathematics course. Students are placed in a local elementary school classroom and are given opportunities to engage in classroom observations, curriculum planning and implementation, and guided reflective practice. Corequisite: MTED 2200 or MTED 3250. May be taken only once. [1]

MTED 3320. Introduction to Literacies in Mathematics. [Formerly MTED 2690] This course is intended for licensure candidates in secondary education for mathematics and for other students who want to explore the concepts and practices of disciplinary literacy that is the links between content and communication. [3]

MTED 3360. Computers, Teaching, and Mathematical Visualization. [Formerly MTED 2800] Examining the 7-14 mathematics curriculum as a body of ideas that students can develop over time and the use of computer environments to support teaching and learning them. [3]

MTED 3370. Teaching Mathematics in Secondary Schools. [Formerly MTED 2370] Study of conceptual structure, curriculum, objectives, instructional approaches, materials, learning theory, and philosophies of assessment as they relate to teaching mathematics in middle and secondary schools. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: MTED 3371. [3]

MTED 3371. Practicum in Secondary Education III. [Formerly MTED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite: MTED 3370 [1]

MTED 3850. Independent Study in Mathematics Education. [Formerly MTED 2960] Semi-independent study on selected topics in mathematics education. May be repeated. Consent of supervising instructor. [1-3]

MTED 3890. Special Topics in Mathematics Education. [Formerly MTED 2690] Exploration of special topics related to mathematics education. May be repeated with change of topic. [1-3]

MTED 4963. Student Teaching Seminar: Secondary. [Formerly MTED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

Science Education

SCED 2330. Pedagogy Seminar. This pedagogy seminar accompanies a core course in the College of Arts and Science and examines the process of teaching and learning of that course content. Students enrolled in the core course lecture may elect to participate in this accompanying one credit pedagogy seminar. This optional seminar will be team-taught by the core course instructor and an education faculty member. [1]

SCED 3240. Teaching Science in Elementary Schools. [Formerly SCED 2250/2240] Study of the nature of science, discovery (inquiry) teaching and learning, curriculum approaches, goals and standards, trends, instructional and assessment strategies, and resources and materials for teaching science in grades K-5, with emphasis on grades 2-5. [2]

SCED 3320. Introduction to Literacies in Science. [Formerly SCED 2690] This course is intended for licensure candidates in secondary science education and for other students who want to explore the concepts and practices of disciplinary literacy, that is, the links between content and communication. [3]

SCED 3370. Teaching Science in Secondary Schools. [Formerly SCED 2370] Study of instructional approaches, materials, curriculum resources, trends, inquiry teaching and learning, for teaching in secondary schools. Required for secondary school licensure in the sciences. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: SCED 3371. [3]

SCED 3371. Practicum in Secondary Education III. [Formerly SCED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite SCED 3370 [1]

SCED 3400. Modeling in the Secondary Science Classroom. This course is intended for licensure candidates in secondary science education and for other students who want to explore modeling in the secondary science classroom. [3]

SCED 3850. Independent Study in Science Education. [Formerly SCED 2960] Semi-independent study on selected topics in science education. May be repeated. Consent of supervising instructor required. [1-3]

SCED 3890. Special Topics in Science Education. [Formerly SCED 2690] Exploration of a special topic related to science education. May be repeated with change of topic. [1-3]

SCED 4963. Student Teaching Seminar: Secondary. [Formerly SCED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

Social Studies Education

SSED 2100. Scientific and Historical Reasoning in Young Children. [Formerly SSED 2100] This course focuses on issues of the development of subject matter reasoning and understanding in young children. The course will examine the interplay between informal and formal experiences that influence the development of scientific and historical reasoning as children transition from their intuitive theories to a more formal study of subject matter disciplines. [3]

SSED 2300. Pedagogy Seminar. This pedagogy seminar accompanies a core course in the College of Arts and Science and examines the process of teaching and learning of that course content. Students enrolled in the core course lecture may elect to participate in this accompanying one credit pedagogy seminar. This optional seminar will be team-taught by the core course instructor and an education faculty member. [1]

SSED 3240. Teaching Social Studies in Elementary Schools. [Formerly SSED 2210/2240] Study of conceptual structure of social studies curricula with emphasis on curricular objectives, instructional approaches, teaching materials, and evaluative strategies focusing on teaching social studies in grades K-5, with emphasis on grades 2-5. Corequisite: SCED 3240 and EDUC 3240. [2]

SSED 3260. Human Geography. [Formerly SSED 2400] (Also listed as SSED 6240 for Professional Students) An examination of the human and cultural aspects of various regions of the world including the spatial manifestations of culture, population distribution and movements, language, religion, ethnicity, political geography and resource issues. The course examines human geography themes at local, national and international levels and probes the nature of geographical thinking and the characteristics of geography as a social science. [3]

SSED 3320. Introduction to Literacies in the Social Studies. [Formerly SSED 2690] This course is intended for licensure candidates in secondary education for social studies and for other students who want to explore the concepts and practices of disciplinary literacy that is the links between content and communication. [3]

SSED 3370. Teaching Social Studies in Secondary Schools. [Formerly SSED 2370] Instructional principles and techniques of teaching social studies. Required of students seeking secondary school licensure in social studies, a social science field, or history. Prerequisite: EDUC 3310 or consent of instructor. Corequisite: SSED 3371. [3]

SSED 3371. Practicum in Secondary Education III. [Formerly SSED 2360] Observation, participation, and teaching in middle school and secondary school settings. Corequisite: SSED 3370 [1]

SSED 3850. Independent Study in Social Studies Education. [Formerly SSED 2960] Semi-independent study on selected topics in social studies education. May be repeated. Consent of supervising instructor required. [1-3]

SSED 3890. Special Topics in Social Studies Education. [Formerly SSED 2690] Exploration of special topics related to social studies education. May be repeated with change of topic. [1-3]

SSED 4963. Student Teaching Seminar: Secondary. [Formerly SSED 2292] Seminar to accompany EDUC 4953. A \$300.00 Teacher Performance Assessment fee is associated with this course. [3]

Peabody Honors Scholars

PSCH 1110. Peabody Honors Seminar I. Spring seminar for selected Peabody students. [3]

PSCH 1115. Peabody Scholars Seminar. Seminar for first-year Peabody and Patterson Scholars. Topics will vary. [3]

PSCH 1817. Peabody Honors Seminar in the Humanities and Creative Arts. Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credit hours per semester of enrollment. [3]

PSCH 1827. Peabody Perspectives Honors Seminar. Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credit hours per semester of enrollment. [3]

PSCH 1837. Peabody Honors Seminar Behavioral and Social Sciences. Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credit hours per semester of enrollment. [3]

PSCH 1847. Peabody Honors Seminar in History and Culture of the United States. Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credit hours per semester of enrollment. [3]

PSCH 1857. Peabody Honors Seminar in Mathematics and Natural Science. Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credit hours per semester of enrollment. [3]

PSCH 1867. Peabody Honors Seminar in International Cultures. Offered on a graded basis only. May be repeated for credit more than once if there is no duplication in topic, but students may earn only up to 6 credit hours per semester of enrollment. [3]

PSCH 2115. Peabody Scholars Seminar II. Seminar for Peabody Scholars in the second year of study. Topics vary. [0-3]

PSCH 3110. Peabody Scholars Seminar III. Seminar for Peabody Scholars in the third year of study. Topics vary. [0-1]

PSCH 4965. Peabody Scholars Capstone Seminar I. Capstone seminar for Peabody Scholars to be taken fall semester of the senior year. [0-3]

PSCH 4966. Peabody Scholars Capstone Seminar II. Capstone seminar for Peabody Scholars to be taken spring semester of the senior year. [0-3]

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