Vanderbilt University Graduate School

www.vanderbilt.edu/gradschool

VANDERBILT

Graduate School

Vanderbilt
University
2006/2007

Containing general information
and courses of study
for the 2006/2007 session
corrected to 5 July 2006
Nashville

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 bulletin 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 non-curricular matters and concerning withdrawal for medical or emotional reasons can be found in the *Student Handbook*, which is on the Vanderbilt Web site at *www.vanderbilt.edu/student_handbook*.

NONDISCRIMINATION STATEMENT
In compliance with federal law, including the provisions of Title IX of the Education Amendments of 1972, Title VI of the Civil Rights Act of 1964, Sections 503 and 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990, Vanderbilt University does not discriminate on the basis of race, sex, religion, color, national or ethnic origin, age, disability, or military service in its administration of educational policies, programs, or activities; its admissions policies; scholarship and loan programs; athletic or other university-administered programs; or employment. In addition, the university does not discriminate on the basis of sexual orientation consistent with university non-discrimination policy. Inquiries or complaints should be directed to the Opportunity Development Officer, Baker Building, VU Station B #351809, 2301 Vanderbilt Place, Nashville, Tennessee 37235-1809. Telephone (615) 322-4705 (V/TDD); fax (615) 343-4969.

The text of this bulletin is printed on recyclable paper with biodegradable ink.

Copyright © 2006 Vanderbilt University

Printed in the United States of America

Contents

Calendar	**6**
Graduate Study at Vanderbilt	**7**
Life at Vanderbilt	**17**
Academic Programs	**31**
Admission	**39**
Financial Information	**43**
Academic Regulations	**51**
Courses of Study	**63**
Administration and Faculty	**344**
Index	**411**

Graduate School Calendar 2006/2007

FALL SEMESTER 2006

Classes begin / Wednesday 23 August
Last day to submit Intent to Graduate forms for December graduation / Friday 22 September
Fall break / Monday 16 October–Tuesday 17 October
Homecoming / Friday 20 October–Saturday 21 October
Last day to withdraw from courses without academic penalty / Friday 20 October
Thanksgiving holidays / Saturday 18 November–Sunday 26 November
Final day for submission of theses and dissertations to the Graduate School for graduation in December / Friday 1 December
Reading days and examinations / Friday 8 December–Saturday 16 December
Fall semester ends / Saturday 16 December

SPRING SEMESTER 2007

Classes begin / Wednesday 10 January
Last day to submit Intent to Graduate forms for May graduation / Monday 5 February
Spring holidays / Saturday 3 March–Sunday 11 March
Founder's Day / Friday 16 March
Last day to withdraw from courses without academic penalty / Friday 16 March
Final day for submission of theses and dissertations to the Graduate School for graduation in May / Monday 2 April. Electronic submission by Monday 19 March
Reading days and examinations / Wednesday 25 April–Thursday 3 May
Commencement / Friday 11 May

Graduate Study at Vanderbilt

GRADUATE education has held a central place in the program of Vanderbilt University since it opened in 1875. The first doctor of philosophy degree was granted in 1879; the 2,000th in 1975, the university's centennial year. The 3,000th was given in 1985. As of 2006, more than 5,000 doctor of philosophy degrees have been awarded. By way of comparison, the first Ph.D. given by an American university was awarded in 1861, and the second American institution to offer the degree did so in 1870.

A separate Graduate School was established at Vanderbilt in 1935 by action of the Board of Trust, with an official faculty selected from various schools of the university. Selection is based on the individual faculty member's administrative responsibility or substantial participation in graduate instruction.

Vanderbilt offers to able and serious students a faculty that is active in research and deeply committed to the development of scholars. Students participate in classroom, tutorial, and collegial modes of learning and in systematic independent inquiry, in a setting that allows them to see scholars at work, day in and day out, as an important means of learning the scholar's art. Students are in situations in which they are known personally and well, and concern for what happens to them is very strong.

Vanderbilt is a member of the Association of American Universities, a sixty-two-member organization of research-intensive universities. The doctor of philosophy especially, but also the master of arts and master of science, are research degrees, offered by a faculty of research scholars.

The objectives of the Graduate School are to train scholars and to promote research. The faculty seeks to provide every student with thorough knowledge of a particular field and a mastery of the methods of productive scholarship. Wherever feasible, the faculty intends to provide opportunity for all Ph.D. candidates to have supervised teaching experiences.

The Graduate School enrolls about 1,900 students. About 47 percent are women, and 31 percent come from foreign countries.

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 2,500 full-time members and a diverse student body of more than 11,000. Students from many regions, backgrounds, and disciplines come together for multidisciplinary study and research. To that end, the university is the fortunate recipient of continued support from the Vanderbilt family and other private citizens.

The 330-acre campus is about one and one-half miles from the downtown business district of the city, combining the advantages of an urban location with a peaceful, parklike setting of broad lawns, shaded paths, and quiet plazas.

The schools of the university offer the following degrees:

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

College of Arts and Science. Bachelor of Arts, Bachelor of Science.

Blair School of Music. Bachelor of Music.

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

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

Law School. Doctor of Jurisprudence, Master of Laws.

School of Medicine. Doctor of Audiology, Doctor of Medicine, Master of Laboratory Investigation, Master of Science in Medical Physics, Master of Public Health, Master of Science in Clinical Investigation.

School of Nursing. Master of Science in Nursing.

Owen Graduate School of Management. Master of Business Administration, 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.

Accreditation

Vanderbilt University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033, telephone number 404-679-4500) to award bachelor's, master's, specialist's, and doctor's degrees. Vanderbilt is a member of the Association of American Universities.

Facilities

Vanderbilt has many special facilities for study and research in particular areas, as well as the traditional classroom and laboratory facilities associated with graduate instruction.

Graduate instruction in the humanities, the biological sciences, and the social sciences is conducted in Benson, Buttrick, Calhoun, Furman, Garland,

and Wilson halls. Graduate work in religion uses the full facilities of Vanderbilt Divinity School. The E. Bronson Ingram Studio Arts Center, opened in fall 2005, has studios for sculpture, ceramics, photography, computer arts, painting, and drawing. Gallery space is designated for exhibits primarily of students' work.

The Stevenson Center for the Natural Sciences, a complex of seven connected buildings, includes laboratory and lecture facilities for biological sciences, chemistry, geology, mathematics, and physics.

Classrooms and laboratories of Peabody College are used for graduate instruction in education and psychology and human development.

Laboratories for the biomedical sciences—biochemistry, bioinformatics, cancer biology, cell and developmental biology, cellular and molecular pathology, microbiology and immunology, molecular physiology and biophysics, and pharmacology—are in the Vanderbilt Medical Center in Medical Center North, Light Hall, Preston Research Building, and Robinson Research Building. The A. B. Learned Laboratories and Medical Research Building III provide additional facilities for biological sciences. Graduate students in neuroscience use facilities across campus with a home in the Vanderbilt Brain Institute.

Graduate work in engineering uses the laboratories of the School of Engineering, including those in the Olin Hall of Engineering, Featheringill Hall, Jacobs Hall, as well as the Stevenson Center.

The facilities of Owen Graduate School of Management are used for graduate study in management. Graduate students in nursing science use the facilities of Godchaux and Frist Halls, and those in hearing and speech sciences use classrooms and laboratories in the new Vanderbilt Bill Wilkerson Center.

The Jean and Alexander Heard Library

"We often tend to think of a library simply as a collection of books. What we sometimes forget is that a library is a place of interaction, where the minds of students and faculty collide with other minds removed in time and place." —*Chancellor Emeritus Alexander Heard*

The Jean and Alexander Heard Library is one of the important research libraries in the Southeast, with more than 3.0 million volumes in nine libraries. Most materials are shelved in open stacks and are available to students and faculty through Acorn, the library's online catalog. The Heard Library Web site also provides access to a growing number of full-text journals, as well as indexes and other research resources, and is accessible remotely via the campus network and from workstations in each library.

The divisions of the Heard Library include:

Annette and Irwin Eskind Biomedical Library
Central Library (contains resources in the social sciences and humanities)
Divinity Library
Alyne Queener Massey Law Library
Walker Management Library
Anne Potter Wilson Music Library

Peabody Library
Sarah Shannon Stevenson Science and Engineering Library
Special Collections and University Archives

For more information about library collections, facilities, and services, see the library's portal, *www.library.vanderbilt.edu.*

Information Technology Services

Information Technology Services (ITS) offers voice, video, data, and computing services to Vanderbilt students, faculty, and staff.

ITS maintains and supports VUnet, the campuswide data network that provides access to the Internet, and VUnetID, which enables Vanderbilt users to securely identify themselves to many services on VUnet. Services currently authenticated by VUnetID include OASIS, the university's course registration system; Online Access to Knowledge (OAK); VUspace, the university's network file system; and VUmail, the university's e-mail system. VUmail now includes VUmailguard, designed to protect your e-mail from viruses, unwanted mail (spam), and high-risk attachments.

ITS maintains the campus phone (voice) network, including a personal phone line for each resident student. Optional services include voice mail and long-distance calls from campus (V-net). ITS also partners with Sprint to offer discounts for cellular phone service.

For campus residents, ITS supports ResNet, which provides a direct connection to VUnet and the Internet. Phone and cable television ports are provided in each campus residence. For more information about ResNet, see *www.vanderbilt.edu/resnet*. For those who live off campus, ITS offers VUaccess, a dial-up connection to VUnet and the Internet.

Through the Digital Life initiative, Vanderbilt partners with Napster Music Services and FreshTracks Music to offer VUmix, a legal, safe, inexpensive, and easy way to explore and share music. See *digitallife.vanderbilt.edu* and *www.vanderbilt.edu/vumix* for details.

The ITS Help Desk provides information to students, faculty, and staff about VUnet and VUnet services. Help Desk locations, hours, contacts, and other information can be found at *www.vanderbilt.edu/helpdesk*.

For more information on IT services, visit *its.vanderbilt.edu*.

For more information on computing at Vanderbilt, visit *www.vanderbilt.edu/technology*.

The Center for Teaching

The Center for Teaching, located in 116 Calhoun Hall, offers services to the entire Vanderbilt University teaching community, including those who currently teach, those who are just beginning to teach, and those who anticipate that teaching will be a part of their future careers. The services of the center are available to all graduate students, and some programs are designed especially for teaching assistants (TAs). Below is a description of programs of interest to graduate students.

The *Fall TA Orientation* introduces participants to teaching at Vanderbilt, focusing specifically on the information and skills necessary to begin in the classroom. Workshops and practice teaching sessions are led by experienced graduate student and professional student teaching assistants.

The *Teaching Certificate* program has been designed to help graduate students, professional students, and post-doctoral fellows develop and refine their teaching skills through three cycles of teaching activities, each consisting of inquiry, experimentation, and reflection phases. Participants who complete the program receive a Teaching Certificate from the Graduate School and the Center for Teaching.

The *Graduate Student Teaching Event for Professional Development (GradSTEP)* is an annual conference that features concurrent sessions on teaching topics ranging from learner-centered course design to teaching while dissertating.

The *International Teaching Assistant Program (ITAP)* coordinates programs and services to assist international teaching assistants in the development of skills for teaching in the American classroom.

The *Graduate Teaching Fellows and Teaching Affiliates Program* provides graduate students the opportunity to work at the center, facilitating the programs offered to graduate students, consulting with TAs, and collaborating on teaching-related projects.

For more information or access to our library, please visit the Center for Teaching Web site at *www.vanderbilt.edu/cft* or stop by the Center for Teaching, 116 Calhoun Hall, (615) 322-7290.

Interdisciplinary Centers, Institutes, and Initiatives

Vanderbilt actively promotes research and teaching that crosses disciplines, departments, and institutional lines through a multitude of centers and institutes. Some of these programs receive funding through the Chancellor's Academic Venture Capital Fund, whose purpose is to launch major new interschool or transinstitutional initiatives in promising research fields. Below is a sampling of Vanderbilt's interdisciplinary initiatives. For more information, see *www.vanderbilt.edu/researchers.html*.

THE CAL TURNER PROGRAM FOR MORAL LEADERSHIP IN THE PROFESSIONS fosters an environment conducive to faculty research and teaching in areas associated with moral leadership, helps students develop the ability to provide moral leadership within their chosen professions and within the broader community, and serves as a resource for professionals. *www.vanderbilt.edu/moral_leadership*

THE CENTER FOR THE AMERICAS seeks to provide innovative perspectives on history, culture, and society by bringing together scholars whose research and teaching cross disciplinary boundaries and the political and geographical boundaries of North, Central, and South America. *www.vanderbilt.edu/americas*

THE CENTER FOR COMMUNITY STUDIES brings together psychologists, anthropologists, sociologists, and other social scientists with decades of experience in community development, community organizing, and community building. The center works locally, nationally, and internationally with public agencies, private companies, and local community organizations to conduct and apply academic research to improve quality of life in communities. *peabody.vanderbilt.edu/ccs*

THE CENTER FOR ETHICS fosters critical reflection, wide understanding, and types of engagement that encourage people with different ways of living and learning to examine their own values as well as those of others and to live constructively and wisely together. The center initiates and supports programs and projects that advance teaching, research, and public programs concerned with ethics. The center is particularly interested in drawing on expertise and resources across the university. It encourages university-wide exchange and cooperation and works to create new fields of knowledge, new opportunities for instruction, and new possibilities for personal and social life. The foci of the center's programs are faculty development, curriculum development, research, citizenship, and outreach. *www.vanderbilt.edu/CenterforEthics*

THE CENTER FOR INTEGRATIVE AND COGNITIVE NEUROSCIENCE supports the quest to comprehend how the brain produces thought and emotion. The purpose of this endeavor is not only to develop more effective treatments for mental and neurological disorders, but also to further our understanding of what it is to be human. CICN researchers focus on three areas: sensory science; development, learning and memory; and clinical neuroscience. *http://cicn.vanderbilt.edu*

THE CENTER FOR LATIN AMERICAN AND IBERIAN STUDIES, established in 1947, works to advance knowledge about and understanding of Latin America and Iberia. The center administers the Latin American Studies undergraduate and master's programs, as well as a joint master of arts and master of business administration program with the Owen Graduate School of Management. CLAIS also brings speakers, visiting scholars, and conferences to campus and arranges for Vanderbilt professors to visit local classrooms. *http://sitemason.vanderbilt.edu/clais*

THE CENTER FOR MEDICINE, HEALTH, AND SOCIETY has more than one hundred affiliates from all schools and colleges of the university. It offers an undergraduate program (minor and contract major in medicine, health, and society) and sponsors seminars, workshops, lectures, and conferences. Any interested faculty member or student may affiliate with the center. *www.vanderbilt.edu/mhs*

THE CENTER FOR THE STUDY OF RELIGION AND CULTURE draws from Vanderbilt's ten schools to advance a well-recognized history of excellence in the study of religion and culture. An intellectual incubator, the center helps develop projects that address the most current social, political, economic, and other issues involving religion and culture through small grants, graduate fellowships, and cosponsorship of lectures, seminars, and conferences. *www.vanderbilt.edu/csrc*

THE CURB CENTER FOR ART, ENTERPRISE, AND PUBLIC POLICY examines the complex, decentralized system through which federal legislation, government regulation, and the policies of film studios, record companies, and broadcasters shape America's cultural landscape. *www.vanderbilt.edu/curbcenter*

THE LEARNING SCIENCES INSTITUTE comprises a group of interdisciplinary scholars studying how we learn, with a special focus on new uses of technology and innovative teaching practices to enhance learning. *www.vanderbilt.edu/lsi*

THE ROBERT PENN WARREN CENTER FOR THE HUMANITIES promotes interdisciplinary research and study in the humanities, social sciences, and natural sciences. The center is designed to intensify and increase interdisciplinary discussion of academic, social, and cultural issues and also engages in outreach to the community by sponsoring teacher training, lectures and seminars, and publications designed to promote the importance of the humanities in today's world. *www.vanderbilt.edu/rpw_center*

THE VANDERBILT BILL WILKERSON CENTER FOR OTOLARYNGOLOGY AND COMMUNICATION SCIENCES welcomed patients, students, and researchers to its new $61 million home in 2005. The center houses the nation's top audiology program as well as programs in speech-language pathology and hearing and speech science. It serves more than 50,000 patients each year. *www.mc.vanderbilt.edu/root/vumc.php?site=aboutbw*

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 two hundred scientists from forty departments, centers, and institutes across the campus, spanning a spectrum of study from molecules to the mind. Vanderbilt's neuroscience training programs foster the development of trainees to independent research scientists and educators, preparing them for careers in an integrative discipline. The undergraduate neuroscience major is an interdisciplinary program from several departments and schools providing a comprehensive background in biology, chemistry, mathematics, and physics as well as a strong foundation in the fundamentals of neuroscience. *http://braininstitute.vanderbilt.edu*

THE VANDERBILT CENTER FOR CHILD AND FAMILY POLICY bridges research, policy, and best practice to benefit children and families. The center provides direct services to current and former foster youth and helps these individuals as well as families, community groups, and neighborhoods effect change on public policy at the local, state, and national level. *www.vanderbilt.edu/VIPPS/C&FPC*

THE VANDERBILT INSTITUTE FOR INTEGRATIVE BIOSYSTEMS RESEARCH AND EDUCATION unites biological and physical scientists and engineers who have interest in working at the multifaceted interface of biology, chemistry, education, engineering, medicine, and physics. VIIBRE targets much of its activities toward research and education in post-genomic systems biology. The institute is distinguished by its focus on the development and application of advanced cellular instrumentation and on the creation and implementation of pedagogically sound programs in interdisciplinary education. *www.vanderbilt.edu/viibre*

THE VANDERBILT INSTITUTE FOR PUBLIC POLICY STUDIES addresses a wide range of issues, including health policy, urban social policy and revitalization of low-income inner-city neighborhoods, crime and anti-social behavior, social welfare, and joint U.S.-Japan business and technical cooperation. VIPPS provides opportunities for undergraduate and graduate students to learn about research design, implementation, and data analysis. Students are mentored by senior researchers and participate in all phases of research projects. By participating in research projects, students develop critical thinking skills and learn how to translate research findings into practical policy recommendations. *www.vanderbilt.edu/VIPPS*

THE VANDERBILT INSTITUTE OF CHEMICAL BIOLOGY provides research and training in the application of chemical approaches to the solution of important biomedical problems. Particular strengths of the institute include analytical methodology and molecular imaging, cellular responses to chemical stress, small molecule discovery, enzyme and receptor chemistry, proteomics, structural biology, and chemical synthesis. The center trains graduate students, recruits new faculty members with needed expertise, and runs a seminar program. *www.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 works to acquire the equipment needed to conduct nanoscale research, trains graduate students, and provides a point of focus for chemists, physicists, and engineers at Vanderbilt with research interests in nanoscience. VINSE includes programs in nano-optics; nano-bioprocesses; spintronics; nanoscale electronics; nanocrystal fabrication, characterization, and integration; and radiation effects and defect studies. *http://vinse.vanderbilt.edu*

THE VANDERBILT KENNEDY CENTER FOR RESEARCH ON HUMAN DEVELOPMENT is one of fourteen national centers for research on mental retardation and developmental disabilities supported in part by the National Institute of Child Health and Human Development. It also is a University Center for Excellence in Developmental Disabilities Education, Research, and Service in the national network of sixty-four such centers in every U.S. state and territory supported by the U.S. Administration on Developmental Disabilities. The mission of the Kennedy Center is to improve, through research, training, and outreach, the quality of life of persons with disorders of thinking, learning, perception, communication, mood and emotion caused by disruption of typical development. The center is a university-wide institute, with interdisciplinary research programs addressing four broad areas: communication and learning, developmental neurobiology and brain plasticity, emotion and mood, and families. Students have the opportunity to collaborate in research with mentorship from renowned Kennedy Center scientists in Vanderbilt research training programs in developmental disabilities, developmental psychopathology, neurogenomics, neuroscience, vision science, and special education. Observation, practicum, and clinical experiences are available in the center's clinical programs. *http://kc.vanderbilt.edu*

THE VANDERBILT UNIVERSITY INSTITUTE OF IMAGING SCIENCE aims to support advances in physics, engineering, computing, and other basic sciences for the development and application of new and enhanced imaging techniques to address important problems in biology and medicine, in health and disease. *www.vuiis.vanderbilt.edu*

VANDERBILT UNIVERSITY SLOAN CENTER FOR INTERNET RETAILING leverages the expertise of eLab, founded by two Owen Graduate School of Management professors as the nation's first academic e-business research center, to study the enormous challenges and opportunities of Internet retailing. *http://elab.vanderbilt.edu*

Other initiatives include:

Addiction Research Center

Advanced Computing Center for Research and Education

American Economic Association

Arthritis and Joint Replacement Center

Biomathematics Study Group

Bishop Joseph Johnson Black Cultural Center

Career Center

Carpenter Program in Religion, Gender, and Sexuality

Center for Biomedical Ethics and Society

Center for Child Development

Center for Clinical Toxicology

Center for Community Studies

Center for Constructive Approximation

Center for Entrepreneurship Education

Center for Evaluation and Program Improvement

Center for Integrative and Cognitive Neuroscience

Center for Intelligent Systems

Center for Matrix Biology

Center for Medicine, Health, and Society

Center for Molecular Neuroscience

Center for Science Outreach

Center for Space Physiology and Medicine

Center for Teaching

Center for Vascular Biology

Center on School Choice, Competition, and Achievement

Classroom Organization and Management Program

Clinical Nutrition Research Unit

Clinical Trials Center

Cognitive Robotics Laboratory

Community Outreach Partnership Center

Comprehensive Care Center

Computational Science: Atomic Structure Calculations

Computational Science Education Project

Diabetes Center

Digestive Disease Research Center

Division of Sponsored Research

eLab (Digital Commerce Research Laboratory)

English Language Center

Family-School Partnership Lab

Financial Markets Research Center

Forum for Entrepreneurship Education

Freedom Forum First Amendment Center at Vanderbilt University

General Clinical Research Center

Genetic Epidemiology Centers

Geriatric Evaluation Program

Informatics Center

Initiative in Biomathematics

Institute for Software Integrated Systems

Institute for Space and Defense Electronics

Intelligent Robotics Laboratory

Interdisciplinary Graduate Program in the Biomedical Sciences (IGP)

IRIS Center for Faculty Enhancement

Joint Center for Nursing Research

Kelly Miller Smith Institute on Black Church Studies

Laser Diagnostics and Combustion Group

Law and Business Program

Leadership Development Center

Learning Technology Center

Living State Physics

Margaret Cuninggim Women's Center

Mass Spectrometry Research Center

Max Kade Center for European and German Studies

Middle Tennessee Poison Center

Opportunity Development Center

Owen Entrepreneurship Center

Peabody Center for Education Policy

Principals Leadership Academy of Nashville

Program in Human Genetics

Program in Law and Business

Program in Structural Biology

Proteomics and Functional Biology
- Cryo-electron Microscopy Facility
- Gene Profiling Laboratory
- Vanderbilt Inst. for Imaging Sciences Proteomics Laboratory

Radiation Effects and Reliability Group

Sleep Center

Smart Structures Laboratory

Specialized Center of Research in Acute Lung Injury

Specialized Center of Research in Newborn Lung Disease

Structural Biology Program

Susan Gray School for Children

Tennessee Lions Eye Center at Vanderbilt Children's Hospital

TV News Archive

Vanderbilt Addiction Research Center

Vanderbilt Breast Center

Vanderbilt Center for Better Health

Vanderbilt Center for Environmental Management Studies

Vanderbilt Center for Evidence-Based Medicine

Vanderbilt Center for Stem Cell Biology

Vanderbilt Engineering Center for Transportation Operations and Research

Vanderbilt Executive Development Institute

Vanderbilt Eye Center

Vanderbilt-Ingram Cancer Center

Vanderbilt Institute for Public Policy Studies (VIPPS)
- Center for Child and Family Policy
- Center for Evaluation Research and Methodology
- Center for Health Policy
- Center for Psychotherapy Research and Policy
- Center for State and Local Policy
- Center for U.S.-Japan Studies and Cooperation

Vanderbilt-Meharry Center for AIDS Research

Vanderbilt-Northwestern-Texas-Harvard/MIT Engineering Research Center for Bioengineering Educational Technologies

Vanderbilt Program for Talented Youth

Vanderbilt Sports Medicine Center

Vanderbilt Transplantation Center

Vanderbilt Voice Center

Vision Research Center

W. M. Keck Free-Electron Laser Center / Biophotonics Program

W. T. Bandy Center for Baudelaire and Modern French Studies

Zebrafish Program in Functional Genomics

Life at Vanderbilt

VANDERBILT provides a full complement of auxiliary services to meet the personal needs of students, to make life on the campus comfortable and enjoyable, and to provide the proper setting for academic endeavor.

Graduate Student Council

The Graduate Student Council (GSC) exists to enhance the overall graduate experience at Vanderbilt by promoting the general welfare and concerns of the graduate student body, creating new programs and initiatives to provide opportunities for growth and interaction, and communicating with the Vanderbilt faculty and administration on behalf of graduate students. These goals are accomplished through a structure of elected representatives, standing committees, and officers. Meetings, which are open to all graduate students, are held monthly. Council meetings provide a forum in which to address many types of concerns. In the recent past, the GSC has helped change policies involving the process for approving dissertations, TA advocacy, parking, student health insurance coverage, housing, and the student-funded recreation center. The GSC is also a member of the National Association of Graduate and Professional Students (NAGPS). Through this organization, the GSC participates in national lobbying efforts and benefits from the experiences of other student organizations. Each year GSC sends representatives to regional or national meetings to represent Vanderbilt and to interact with other graduate students from across the country.

In addition to its representative function, the GSC also organizes a number of events and hosts/sponsors various projects during the year. Some examples include co-sponsoring seminars and panels with individual departments, Graduate Student Research Day (early spring semester), the Graduate Student Honor Council, community outreach activities, and social opportunities. The GSC also awards travel grants to graduate students who wish to present their research at conferences throughout the year. All Vanderbilt graduate students are welcome to attend GSC's monthly meetings and to get involved. For more information, visit *www.vanderbilt.edu/gsc*.

Housing

To support the housing needs of new and continuing graduate and professional students, the Office of Housing and Residential Education provides a Web-based off-campus referral service (*https://apphost1a.its.vanderbilt.edu/housing*). The referral service lists information on housing accommodations off campus. The majority of rental property is close to the campus. Cost, furnishings, and conditions vary greatly. For best choices, students seeking off-campus housing should visit the office or

consult the Web site by early July for suggestions and guidance. The Web site includes advertisements by landlords looking specifically for Vanderbilt-affiliated tenants, as well as by Vanderbilt students looking for roommates. Listings are searchable by cost, distance from campus, number of bedrooms, and other parameters. Students may also post "wanted" ads seeking roommate or housemate situations. On-campus university housing for graduate or professional students is not available.

Change of Address

Students who change either their local or permanent mailing address are expected to notify school and university registrars immediately. Candidates for degrees who are not in residence should keep the school and University Registrar informed of current mailing addresses. To change or update addresses, go to *http://registrar.vanderbilt.edu/academicrec/address.htm.*

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 Student Recreation 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., and Tuesdays until 7:00 p.m. For more information, see the Web site at *http://thecard.vanderbilt.edu*.

Eating on Campus

Vanderbilt Dining operates several food facilities throughout campus that provide a variety of food and services. The largest dining facility is Rand Dining Center behind the Sarratt Student Center, serving breakfast, lunch, and dinner Monday through Thursday, lunch on Friday, brunch on Saturday, and brunch and dinner on Sunday. Six convenience stores on campus offer grab-and-go meals, snacks, beverages, and groceries. All units accept the Commodore Card. For more information, visit the Web site at *www.vanderbilt.edu/dining*.

Obtaining Information about the University

Notice to current and prospective students: In compliance with applicable state and federal law, the following information about Vanderbilt University is available:

Institutional information about Vanderbilt University, including accreditation, academic programs, faculty, tuition, and other costs, is available in the catalogs of the colleges and schools on the Vanderbilt University Web site at *www.vanderbilt.edu/catalogs*. A paper copy of the *Undergraduate Catalog* may be obtained by writing the Vanderbilt University Bookstore, Rand Hall, 2300 Vanderbilt Place, Nashville, TN 37240 or by calling (615) 322-2994. Paper copies of the catalogs for the graduate and professional schools may be available from the individual schools.

Information about financial aid for students at Vanderbilt University, including federal and other forms of financial aid for students, is available from the Office of Student Financial Aid on the Vanderbilt University Web site at *www.vanderbilt.edu/FinancialAid/*. The Office of Student Financial Aid is located at 2309 West End Avenue, Nashville, TN 37203-1725, (615) 322-3591 or (800) 288-0204.

Information about graduation rates for students at Vanderbilt University is available on the Vanderbilt University Web site at *http://virg.vanderbilt.edu/virg/option1/virg1_flash.htm*. Select "Factbook," then "Student Profile," then "Retention Rates." Paper copies of information about graduation rates may be obtained by writing the Office of the University Registrar, Vanderbilt University, Peabody #505, 230 Appleton Place, Nashville, TN 37203-5721 or by calling (615) 322-7701.

The annual *Security at Vanderbilt* report on university-wide security and safety, including related policies, procedures, and crime statistics, is available from the Vanderbilt University Police Department on the university Web site at *http://police.vanderbilt.edu/secatvu.htm*. A paper copy of the report may be obtained by writing the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, TN 37212 or by calling (615) 343-9750. For more information, see "Vanderbilt Police Department" in the following section of this catalog.

A copy of the annual *Equity in Athletics Disclosure Act Report* on the Vanderbilt University athletic program participation rates and financial support data may be obtained by writing the Vanderbilt University Office of Athletic Compliance, 2601 Jess Neely Drive, P.O. Box 120158, Nashville, TN 37212 or by calling (615) 322-4727.

Information about your rights with respect to the privacy of your educational records under the Family Educational Rights and Privacy Act is available from the Office of the University Registrar on the Vanderbilt University Web site at *www.registrar.vanderbilt.edu/academicrec/privacy.htm*. Paper copies of this information about educational records may be obtained by writing the Office of the University Registrar, Vanderbilt University, Peabody #505, 230 Appleton Place, Nashville, TN 37203-5721 or by calling (615) 322-7701. For more information, see "Confidentiality of Student Records" in the following section of this catalog.

Services to Students

Confidentiality of Student Records (Buckley Amendment)

Vanderbilt University is subject to the provisions of federal law known as the Family Educational Rights and Privacy Act (also referred to as the Buckley Amendment or FERPA). This act affords matriculated students certain rights with respect to their educational records. These rights include:

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 University Registrar written

requests that identify the record(s) they wish to inspect. 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 University Registrar does not maintain the records, the student will be directed to the university official to whom the request should be addressed.

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.

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. One such situation is 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); a person or company 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.

The Buckley Amendment 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, addresses, telephone number, e-mail address, student ID photos, date and place of birth, 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 similar information. Any new entering or currently enrolled student who does not wish disclosure of directory information should notify the University Registrar in writing. No element of directory information as defined above is released for students who request nondisclosure except in situations allowed by law. The request to withhold directory information will remain in effect as long as the student continues to be enrolled, or until the student files a written request with the University Registrar to discontinue the withholding. To continue nondisclosure of directory information after a student ceases to be enrolled, a written request for continuance must be filed with the University Registrar during the student's last term of attendance.

If a student believes the university has failed to comply with the Buckley Amendment, he or she may file a complaint using the Student Complaint and Grievance Procedure as outlined in the *Student Handbook.* If dissatisfied with the outcome of this procedure, a student may file a written complaint with the Family Policy and Regulations Office, U.S. Department of Education, Washington, D.C. 20202.

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

Vanderbilt Directory Listings

Individual listings in the online *People Finder Directory* consist of the student's full name, school, academic classification, local phone number, local address, box number, and permanent address. The printed *Vanderbilt Directory* also contains these items unless the student blocks them by September 1 using the update option of the *People Finder Directory*. Student listings in the *People Finder Directory* are available to the Vanderbilt community via logon ID and e-password. Students have the option of making their *People Finder* listings available to the general public (viewable by anyone with access to the Internet), of adding additional contact information such as cellular phone, pager, and fax numbers, and of blocking individual directory items or their listing in its entirety. Students who have placed a directory hold with the University Registrar will not be listed in the online directory. To avoid being listed in the printed directory, the request for a directory hold must be on file prior to September 1.

Directory information should be kept current. Students may report address changes via the Web by going to *www.vanderbilt.edu/students.html* and clicking on *Student Web Applications* and *Address Change*.

Psychological and Counseling Center

The Psychological and Counseling Center is a broad-based service center available to full-time students, faculty, staff, and their partners and dependents. Services include: 1) family, couples, individual, and group counseling and psychotherapy; 2) psychological and educational assessment; 3) career assessment and counseling; 4) programs such as assertiveness training; marital communication; individual reading and study skills/test-taking techniques; body image, stress, and time management; group support programs for acquiring skills such as relaxation; 5) administration of national testing programs; 6) outreach and consultation; 7) special programming related to diversity issues; 8) campus speakers and educational programs.

Eligible persons may make appointments by visiting the Psychological and Counseling Center or by calling (615) 322-2571. Services are confidential to the extent permitted by law. For more information, see the Web site, *www.vanderbilt.edu/pcc.* The site also contains self-reflection questions and information resources for counseling services.

Career Center

The Vanderbilt Career Center empowers students of Vanderbilt University to develop and implement career plans. This is accomplished by offering a variety of services and educational programs that help students determine career options, learn job search skills, gain career-related experience, and connect with employers.

Services include individual career advising, career resource center, graduate and professional school services, career-related seminars and workshops, resume consultation, interview training, internship opportunities, career fairs, campus interviews, credentials services through Interfolio, part-time and full-time job listings, and resume referrals. For detailed information about the Career Center, view the Web site at *www.vanderbilt.edu/career*, or visit the office at 220 Student Life Center, 310 25th Avenue South.

Student Health Center

The Vanderbilt Student Health Center (SHC) in the Zerfoss Building is a student-oriented facility that provides routine and acute medical care similar to services rendered in a private physician's office or HMO.

The following primary care health services are provided to students registered in degree-seeking status without charge and without copayment: visits to staff physicians and nurse practitioners; personal and confidential counseling by mental health professionals; routine procedures; educational information and speakers for campus groups; and specialty clinics held at the SHC.

These SHC primary care services are designed to complement the student's own insurance policy, HMO, MCO, etc., coverage to provide comprehensive care. Students are billed for any services provided outside the SHC or by the Vanderbilt University Medical Center.

The entire medical staff is composed of physicians and nurse practitioners who have chosen student health as a primary interest and responsibility.

The Zerfoss Student Health Center is open from 8:00 a.m. to 4:30 p.m., Monday through Friday, and 8:30 a.m. until noon on Saturday, except during scheduled breaks and summer. Students should call ahead to schedule appointments, (615) 322-2427. A student with an urgent problem will be given an appointment that same day or "worked in" if no appointment is available. When the Health Center is closed, students needing acute medical care may go to the Emergency Department of Vanderbilt University Hospital. They will be charged by the VU Medical Center for Emergency Department services.

Students may also call (615) 322-2427 for twenty-four-hour emergency phone consultation, which is available seven days a week (except during summer and scheduled academic breaks). On-call Student Health professionals take calls after regular hours. Calls between 11:00 p.m. and 7:00 a.m. are handled by the Vanderbilt University Emergency Department triage staff. More information is available on the Web (*www.vanderbilt.edu/student_health*).

Student Accident and Sickness Insurance Plan

All degree-seeking students registered for 4 or more credit hours or actively enrolled in research courses that are designated by Vanderbilt University as full-time enrollment are required to have adequate health insurance coverage. The university offers a sickness and accident insurance plan that is designed to provide hospital, surgical, and major medical benefits. A brochure explaining the limits, exclusions, and benefits of

insurance coverage is available to students online at *www.kosterweb.com*, in the Office of Student Accounts, or at the Student Health Center.

The annual premium is in addition to tuition and is automatically billed to the student's account (one half of the premium billed August 1 and one half billed December 1) if an online insurance waiver form is not completed by the August deadline. Coverage extends from August 12 through August 11 of the following year, whether a student remains in school or is away from the university.

Newly enrolled students for the spring term must complete the online waiver process by January 1. The online waiver process indicating comparable coverage **must be completed every year** in order to waive participation in the Student Accident and Sickness Insurance Plan.

Family Coverage. Students who want to obtain coverage for their families (spouse, children, or domestic partner) may secure application forms by contacting the on-campus Student Insurance representative, (615) 343-4688. Dependents can also be enrolled online at *www.kosterweb.com* using a credit card. Additional premiums are charged for family health insurance coverage.

International Student Coverage

International students and their dependents residing in the United States are required to purchase the university's international student health and accident insurance plan. No exceptions are made unless, in the judgment of the university, the student provides proof of coverage that is equal to or greater than that in the university-sponsored policy. This insurance is required for part-time as well as full-time students. Information and application forms are provided through the Student Health Center.

Child Care Center

Vanderbilt Child Care Center operates as a service to university staff members, faculty members, and students. The program serves children from six weeks to five years of age. The center is accredited by the National Academy of Early Childhood Programs.

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 the Opportunity Development Center. Services include, but are not limited to, extended time for testing, assistance with locating sign language interpreters, audiotaped textbooks, physical adaptations, notetakers, and reading services. Accommodations are tailored to meet the needs of each student with a documented disability. The Opportunity Development Center also serves as a resource regarding complaints of unlawful discrimination as defined by state and federal laws.

Specific concerns pertaining to services for people with disabilities or any disability issue should be directed to the Disability Program Director,

Opportunity Development Center, VU Station B #351809, 2301 Vanderbilt Place, Nashville, Tennessee 37235-1809; phone (615) 322-4705 (V/TDD); fax (615) 343-0671; *www.vanderbilt.edu/odc*.

Vanderbilt 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.

The 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 Police Department provides comprehensive law enforcement and security services to all components of Vanderbilt University including the academic campus, Vanderbilt University Medical Center, and a variety of university-owned facilities throughout the Davidson County area. Non-commissioned and commissioned officers staff the department. Commissioned officers are empowered to make arrests as "Special Police Officers," through the authority of the Chief of Police of the Metropolitan Government of Nashville and Davidson County. Vanderbilt officers with Special Police Commissions 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.

The Police Department includes a staff of more than one hundred people. All of Vanderbilt's commissioned officers have completed officer training at a state certified police academy. Those officers hold Special Police Commissions and are required to attend annual in-service, as well as on-the-job training. The department also employs non-academy-trained officers for security-related functions.

The 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 two vans that operate from dusk to 5:00 a.m.

One van makes a continuous loop around campus, taking approximately thirty minutes, making the following ten stops: Police Headquarters, Lupton dormitory at Branscomb Quad, 24th Avenue between Carmichael Towers East and West, Kissam Quad at Hemingway, Terrace Place garage, Wesley Place garage, North Hall, Blair School of Music, Highland Quad at Morgan Circle, and McGugin Center.

A second van runs an express route stopping at the following locations: Lupton dormitory at Branscomb Quad, 24th Avenue between Carmichael Towers East and West, Kissam Quad at Hemingway, North Hall, and Highland Quad at Morgan Circle.

Stops 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. Additional information about Vandy Vans can be found at *http://police.vanderbilt.edu/services.htm* or by calling (615) 322-2558.

As a supplement to the Vandy Vans 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 421-8888 (off campus) or 1-8888 (on campus).

Emergency Phones—Emergency telephones (Blue Light Phones) are located throughout the university campus and medical center.

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 received by dialing 1-1911 from any campus phone. Cell phone users can use (615) 421-1911 to elicit an emergency response on campus. Cell phone users should dial 911 for off-campus emergencies. All callers should be prepared to state their location.

Security Alerts—Security Alerts are distributed throughout Vanderbilt to make community members aware of significant unsolved crimes that occur at the university. They are distributed by mail, postings on public bulletin boards, through Vanderbilt e-mail lists, and through the department's Web page, *http://police.vanderbilt.edu*.

Educational and Assistance Programs—The Community Relations Division of Vanderbilt Police Department offers programs addressing issues such as sexual assault, domestic violence, workplace violence, personal safety, RAD (Rape Aggression Defense) classes, and victim assistance.

For further information on available programs and services, call (615) 322-2558 or e-mail *crimeprevention.atwood@vanderbilt.edu*. Additional information on security measures and crime statistics for Vanderbilt is available from the Police Department, 2800 Vanderbilt Place, Nashville, TN 37212. Information is also available at *http://police.vanderbilt.edu*.

Campus Security Report

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, Vanderbilt University will provide you, upon request, an annual Security Report on university-wide security and safety, including related policies, procedures, and crime statistics. A copy of this report may be obtained by writing or calling the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212 or by telephone at (615) 343-9750. You may also obtain this report on the Web site at *http://police.vanderbilt.edu/secatvu.htm*.

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 the Office of Traffic and Parking located in the Wesley Place garage. A fee is charged. Parking regulations are published annually and are strictly enforced. More information is available at *www.vanderbilt.edu/traffic_parking*.

Bicycles must be registered with the VU Police Department.

Graduate Student Professional and Personal Development Collaborative

The Graduate Student Professional and Personal Development Collaborative (GSPPD Collaborative) is an informal network of faculty, administrators, and students at Vanderbilt University that seeks to facilitate the awareness and use of the many programs that can help students become productive and well-rounded scholars. The collaborative's Web site (*www.vanderbilt.edu/gradschool/gsppd*) provides links to various offices and groups at Vanderbilt that support graduate student development. These offices and organizations also jointly sponsor a number of seminars, workshops, and similar events that support student development.

Bishop Joseph Johnson Black Cultural Center

The Bishop Joseph Johnson Black Cultural Center (BJJBCC) provides educational and cultural programming on the African and African American experience for the Vanderbilt and Nashville communities. Dedicated in 1984, the center is named for the first African American student admitted to Vanderbilt (in 1953), Bishop Joseph Johnson (B.D. '54, Ph.D. '58). The center represents one of Vanderbilt's numerous efforts at acknowledging and promoting diversity.

One of the center's aims is to foster an understanding of the values and cultural heritage of people of African descent worldwide. In this regard, the center serves as a resource for information on African and African American life and culture. Symposia, lectures, musical performances, art exhibitions, audiovisual materials, and publications on the African and African American experience provide a broad spectrum of activities for the university and the general public. The center also provides an office space for the *Afro-Hispanic Review*, which is edited by Vanderbilt faculty and graduate students.

Another of the center's aims is student support. The center does this by providing a meeting space for numerous Vanderbilt student groups. Additionally, center staff members advise campus student organizations on a range of projects. The center promotes student recruitment by hosting various pre-college groups and efforts. One additional goal of the center is community outreach and service. To this end, the center sponsors a Community Speakers Series designed to bring community leaders to campus for talks and forums. The center reaches out to civic and cultural groups and works cooperatively with them. The BJJBCC also provides space for tutoring sessions and mentoring activities for young people from Metro Nashville Public Schools and other institutions, such as the YMCA.

Recently expanded, and renovated, the center houses a computer lab, a small library, a seminar room, an auditorium, a student lounge area, and staff offices. The center is open to all Vanderbilt students, faculty, and staff for programs and gatherings throughout the year. More information is available on the BJJBCC Web site at *www.vanderbilt.edu/BCC*.

International Student and Scholar Services

International Student and Scholar Services (ISSS), located in the new Student Life Center, fosters the education and development of non-immigrant students and scholars to enable them to achieve their academic and professional goals and objectives. ISSS provides advice, counseling, and advocacy regarding immigration, cross-cultural, and personal matters. ISSS supports an environment conducive to international education and intercultural awareness via educational, social, and cross-cultural programs.

ISSS provides immigration advising and services, including the processing of immigration paperwork, to more than 1,500 international students and scholars. The office works with admission units, schools, and departments to generate documentation needed to bring non-immigrant students and scholars to the U.S. Further, ISSS keeps abreast of the regulations pertaining to international students and scholars in accordance with the Department of Homeland Security (Bureau of Citizenship and Immigration Services) and the Department of State. ISSS coordinates biannual orientation programs for students and ongoing orientations for scholars, who arrive throughout the year.

To help promote connection between international students and the greater Nashville community, ISSS coordinates the First Friends program, which matches international students with Americans both on and off campus for friendship and cross-cultural exchange. The weekly World on Wednesday presentations inform, broaden perspectives, and facilitate cross-cultural understanding through discussions led by students, faculty, and staff. International Education Week in the fall and International Awareness Festival in the spring provide the campus with additional opportunities to learn about world cultures and to celebrate diversity. ISSS provides a range of programs and activities throughout the year to address a variety of international student needs and interests. These programs include Vanderbilt International Volunteers, an International Stress Fest, and a selection of holiday parties. Additionally, ISSS staff have been instrumental in developing and implementing the Tennessee Conference for International Leadership which brings together international and study abroad students from across the state for workshops and activities.

Margaret Cuninggim Women's Center

The Margaret Cuninggim Women's Center was established in 1978 to provide support for women at Vanderbilt as well as resources about women, gender, and feminism for the university community. In 1987, the center was named in memory of Margaret Cuninggim, dean of women and later dean of student services at Vanderbilt.

Programs for students, faculty, and staff are scheduled throughout the fall and spring semesters and are publicized on the Web at *www.vanderbilt.edu/WomensCenter* and in the monthly newsletter *Women's VU*, which is distributed without charge to campus addresses on request. Vanderbilt Feminists, a student group that works closely with the women's center, is open to all interested students, both male and female.

The center houses a small library with an excellent collection of books, journals, and tapes. Books and tapes circulate for four weeks. Copy facilities are available. The women's center is also home to Project Safe (PS), a coordinated program of education about, prevention of, and response to violence against women on campus.

Office for GLBT Life

The Vanderbilt Office for Gay, Lesbian, Bisexual, and Transgendered Life serves the entire Vanderbilt community through education, research, programming, counseling, and social events. Visitors are invited to use the office's resource library for research around GLBT issues. The Office for GLBT Life continually seeks to expand its resources and strives to ensure that Vanderbilt University has the most current information concerning GLBT life, gender and sexual diversity, inclusiveness, and social justice. For more information, visit *www.vanderbilt.edu/glbt*, e-mail *glbtoffice@vanderbilt.edu*, or phone (615) 322-3330.

Schulman Center for Jewish Life

The 10,000-square-foot Ben Schulman Center for Jewish Life was formally dedicated in the fall of 2002. The Ben Schulman Center is the home of Vanderbilt Hillel. The goal of the center is to provide a welcoming community for Jewish students at Vanderbilt to further religious learning, cultural awareness, and social engagement. The center offers worship, fellowship, lectures, and social action projects for Vanderbilt's growing Jewish community as well as any student who wants to learn more about Judaism. 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 322-8376 or e-mail *hillel@vanderbilt.edu*.

Religious Life

The Office of the University Chaplain and Affiliated Ministries (*www.vanderbilt.edu/religiouslife*) exists to provide occasions for religious reflection and avenues for service, worship, and action. There are many opportunities to clarify one's values, examine personal faith, and develop a sense of social responsibility.

The Holocaust and Martin Luther King Jr. lecture series, as well as Project Dialogue, provide lectures and programs investigating moral issues, political problems, and religious questions.

Baptist, Episcopal, Jewish, Muslim, Presbyterian, Reformed University Fellowship, Roman Catholic, and United Methodist chaplains work with

individuals and student groups. Provisions for worship are also made for other student religious groups. Counseling and crisis referrals are also available.

Extracurricular Activities

Sarratt Student Center

The Sarratt Student Center (*www.vanderbilt.edu/sarratt*), named for former mathematics professor and dean of students Madison Sarratt, provides a variety of facilities, programs, and activities. The center houses a cinema; an art gallery; art studios and darkrooms for classes and individual projects; work and office spaces for student organizations; comfortable reading and study lounges fully wired for Internet access; large and small meeting rooms; and large, open commons and courtyard areas for receptions or informal gathering. The center also houses the Pub (Overcup Oak) restaurant and Stonehenge Cafe, and leads directly to Rand Dining Center, the Varsity Market, and the Vanderbilt Bookstore. The Vanderbilt Program Board plans concerts, film screenings, classes, speakers, receptions, gallery showings, and many other events throughout the campus. The center's Welcome Desk serves as a campus information center and is a Ticketmaster™ outlet, handling ticket sales for most of the university's and Nashville's cultural events. Sarratt Student Center is home to the Division of Student Life, the Office of Greek Life, the Commodore Card Office, and Vanderbilt Student Communications (including the student newspaper, radio station, and yearbook).

Student Life Center

Opened in April 2005, the Vanderbilt Student Life Center (*www.vanderbilt.edu/studentlifecenter*) is the university's new community keystone. It is both the fulfillment of students' vision to have a large social space on campus and a wonderful complement to Sarratt Student Center.

The Student Life Center has more than 18,000 square feet of event and meeting-room space. The 9,000-square-foot Commodore Ballroom has become one of the most popular spaces to have events on campus.

The center is also home to the Career Center, International Student and Scholar Services, Health Professions Advisory Office, Office of Honor Scholarships and ENGAGE, Office of International Services, and Study Abroad Programs office.

Recreation and Sports

Graduate and professional students are encouraged to participate in the many physical activity classes, intramurals, and sport clubs offered by the university. All students pay a mandatory recreation fee which supports facilities, fields, and programs (see the chapter on Financial Information). Spouses must also pay a fee to use the facilities.

Physical activity classes offered include racquetball, fly fishing, and scuba, along with rock climbing and kayaking. Thirty-eight sport clubs provide opportunity for participation in such favorites as sailing, fencing, rugby, and various martial arts.

The university recreation facilities include gymnasiums, tracks, and four softball diamonds. The four lighted multipurpose playing fields are irrigated and maintained to assure prime field conditions.

The Student Recreation Center houses a 36 meter x 25 yard swimming pool; three courts for basketball, volleyball, and badminton; six racquetball and two squash courts; a weight and fitness room; a wood-floor activity room; a rock-climbing wall; an indoor track; a mat room; locker rooms; and a Wellness Center. Lighted outside basketball and sand volleyball courts and an outdoor recreation facility complement the center.

Academic Programs

THE Graduate School accepts candidates for advanced degrees in fifty-one fields. Master's degrees are awarded in forty-six disciplines and the Doctor of Philosophy in forty-four. The following table lists degree programs and the degrees available. Please note that many of the programs listed below offering a master's degree do not allow admission for a terminal master's degree. Please check the particular program for further information. A page reference indicates the location in this catalog of the program description and course offerings.

ACADEMIC PROGRAMS	MASTER'S	Ph.D.	Page
Anthropology	X	X	64
Art History	X		178
Astronomy	X		244
Biochemistry	X*	X	72
Biological Sciences	X*	X	75
Biomedical Engineering	X	X	80
Biomedical Informatics	X	X	84
Cancer Biology	X*	X	88
Cell and Developmental Biology	X*	X	90
Cellular and Molecular Pathology	X*	X	94
Chemical Engineering	X	X	97
Chemistry	X	X	101
Civil Engineering	X	X	105
Classics	X	X	110
Community Research and Action	X	X	115
Comparative Literature	X	X	117
Computer Science	X	X	121
Creative Writing	X		145
Earth and Environmental Sciences	X		128
Economics	X	X	131
Electrical Engineering	X	X	139
English	X	X	145
Environmental Engineering	X	X	147
French	X	X	152
German	X	X	155
Hearing and Speech Sciences	X	X	162
History	X	X	170
Human Genetics		X	181
Interdisciplinary Materials Science	X	X	183
Latin American Studies	X		189
Leadership and Policy Studies		X	192
Liberal Arts and Science (M.L.A.S.)	X		199
Management		X	200
Mathematics	X	X	211

ACADEMIC PROGRAMS (continued)	MASTER'S	Ph.D.	Page
Mechanical Engineering	X	X	218
Microbiology and Immunology	X*	X	222
Molecular Physiology and Biophysics	X*	X	225
Neuroscience	X*	X	229
Nursing Science		X	233
Pharmacology	X*	X	237
Philosophy	X	X	240
Physics	X	X	244
Political Science	X	X	252
Portuguese	X		320
Psychology	X	X	259
Psychology and Human Development	X	X	264
Religion	X	X	269
Sociology	X	X	314
Spanish	X	X	320
Spanish-Portuguese		X	320
Special Education	X	X	327
Teaching and Learning	X	X	334

* A thesis-based master's degree is awarded only under special circumstances.

Courses of study on the graduate level are offered in a number of areas in which graduate degrees are not offered. Such courses are available as minor work and are described in this catalog's Courses of Study section.

Vanderbilt also offers professional degrees in business administration, divinity, education and human development, engineering, law, management, medicine, nursing, and public policy. Descriptions of these programs may be found in other Vanderbilt catalogs.

Special Programs

Graduate Program in Economic Development

A specialized master's degree program in economics is offered for students from developing countries. The curriculum consists of four core courses in economic theory (macroeconomic and microeconomic), statistics, and econometrics and four electives and a two-semester research seminar. The program offers courses in international trade, project evaluation, and policy analysis; students may also take courses in many other areas of economics, business, finance, and public policy. Field trips are made each year to industries, farms, and communities in the region as well as to the World Bank, International Monetary Fund, and Federal Reserve Board in Washington.

The program is intended primarily for government officials from developing countries and university teachers of economics in those countries. Those who meet the academic requirements of the university also

receive the Master of Arts degree in economics. Students with a strong undergraduate background in economics who are proficient in English may be able to complete all M.A. requirements in twelve months, but experience indicates that most participants require at least eighteen months. Students with promising records may continue studying for the Ph.D. in economics, and are eligible for fellowship consideration.

Center for Latin American and Iberian Studies

The university offers a program of graduate instruction and specialized research that relates the disciplines of the social sciences and humanities to Latin America, with emphasis on Brazil, Colombia, Venezuela, Peru, and Mexico. A joint degree program in which students may earn the M.B.A. and M.A. degrees is available through the Center and the Owen Graduate School of Management. For further information, see Latin American and Iberian Studies in the Courses of Study section.

Master of Fine Arts in Creative Writing

The English department's M.F.A. in creative writing offers writing workshops and supervision in the composition of creative work. Students are required to take a complement of literature courses along with their workshops. The goal of the M.F.A. program is to produce creative writers with a broad and deep knowledge of their genres.

Applicants for the M.F.A. must submit scores in the General Test of the Graduate Record Examination, a college transcript, a manuscript of creative work, a statement of purpose, and three letters of recommendation. For more details see Vanderbilt's M.F.A. Web site: *www.vanderbilt.edu/english/mfa*.

Requirements for the M.F.A. include 42 to 48 hours of course work, a thesis of creative work (a novel, a book of short stories, a collection of poems, or a collection of personal essays), plus an oral defense of the thesis. The course work includes 16 hours of graduate workshops (one per semester for four semesters). Literature courses might consist of 200-level courses taken for graduate credit, for which 3 hours would be given. M.F.A. students may petition the director of graduate studies in the Department of English for admission to 300-level courses other than English 303, 304, 305, 307, or 370.

Master of Arts in Teaching

The Master of Arts in Teaching (M.A.T.) degree available through the Graduate School is designed specifically for the preparation of secondary school teachers in one or more of the following subjects: biology, chemistry, earth science, economics, English, French, German, history, Latin, mathematics, physics, political science, psychology, sociology, and Spanish. The program is designed for those with a bachelor's degree with no professional education background and who are seeking an initial teaching license.

Requirements for admission are the same as for other degree programs in the Graduate School; candidates for the M.A.T. degree must maintain a

B average in all major field and teacher education courses. Completion of the degree without initial teacher licensure requires a total of 36 semester hours of acceptable graduate work. At least 18 hours of this total must be completed in a major field for which teacher licensure is offered and at least 9 hours must be in teacher education course work. M.A.T. candidates seeking initial licensure must complete 29 hours of graduate or professional course work in teacher education for a total of at least 47 semester hours toward the degree. Students seeking initial licensure as part of the M.A.T. program must meet specific requirements monitored by the Office of Teacher Licensure to secure licensure recommendation. These students should identify themselves as early as possible in the M.A.T. program so that their credentials can be audited and screened by faculty in Peabody's Department of Teaching and Learning, through which the professional education component is offered to those who qualify. If review of the candidate's qualifications reveals deficiencies, additional requirements may be identified.

Teacher education programs at Vanderbilt are accredited by the Tennessee State Department of Education and the National Council for the Accreditation of Teacher Education (NCATE). Because of these accreditations and other reciprocal agreements, students who complete the licensure program qualify to be licensed in most other states and countries. The Tennessee State Department of Education calculated a composite pass rate of 100 percent for Vanderbilt graduates who completed a teacher education program during the 2002/2003 academic year and who took one or more PRAXIS examination(s) within the Tennessee-defined time period.

Master of Liberal Arts and Science

The Master of Liberal Arts and Science (M.L.A.S.) degree offers part-time adult students the intellectual stimulation of post-baccalaureate course work at a time in their lives when they can contemplate great ideas and enduring questions and measure them against their own life experiences. In discussion with other adult students under the leadership of distinguished faculty members, they are encouraged to look beyond disciplinary boundaries and explore connections that more specialized undergraduate degrees and focused career responsibilities may have obscured. Students often discover important professional and career benefits as well as personal development in earning a Master of Liberal Arts and Science degree. The requirements and curriculum provide flexibility in program design and course selection, and the tuition, scheduling, admission, and registration procedures acknowledge the special circumstances of the part-time adult student.

Courses are taught by tenured Vanderbilt faculty members (and, perhaps, some distinguished emeritus faculty) carefully selected for their recognized abilities as teachers and their special interest in the M.L.A.S. program. Each course meets one evening a week throughout the semester. Classes are limited in size to encourage optimal student-student and student-faculty interaction.

The Master of Liberal Arts and Science is awarded by the Graduate School and administered by the Dean's Office of the College of Arts and Science. For more information contact the director of the M.L.A.S. program, Martin Rapisarda, Associate Dean, College of Arts and Science, 301 Kirkland Hall, Nashville, Tennessee 37240; (615) 936-5964.

Joint Master of Arts in Latin American Studies and Master of Law

The joint M.A./LL.M. program will allow law students interested in international law in Latin America to gain the cultural, political, and economic background that they will need to work there. Students entering the program will have to be accepted by both the Law School and the Graduate School. At present, to apply to the LL.M. program, students must **not** be U.S. citizens and must already have a J.D. degree (or its equivalent from their home country). Students successfully completing the program will receive an M.A. in Latin American Studies (following an established non-thesis option) and an LL.M. from the Law School (includes writing a thesis).

Medical Scientist Training Program (M.D./Ph.D.)

A combined course of study leading to the M.D. and Ph.D. degrees is offered through Vanderbilt School of Medicine and Vanderbilt Graduate School. The program facilitates the development of teachers and medical investigators in clinical and basic medical sciences. Six to seven calendar years are usually required for completion of the combined degree program.

All candidates must meet both Medical School and Graduate School requirements for matriculation and graduation. Candidates are admitted into the program by the deans of the two schools upon the recommendation of the Medical Scientist Training Program Committee. After their acceptance in the program, students must select and be accepted into the graduate program of an affiliated department. The graduate programs currently affiliated with the Medical Scientist Training Program are biochemistry, biological sciences, biomedical engineering, cancer biology, cell and developmental biology, cellular and molecular pathology, microbiology and immunology, molecular physiology and biophysics, neuroscience, and pharmacology.

M.D./Ph.D. students must pass the qualifying examination for the Ph.D. degree and present an acceptable dissertation within their field of study in the usual manner. Most M.D./Ph.D. students begin full-time study and research for the Ph.D. degree after the second year in medical school and complete the dissertation research before entering the third year of medical study.

Courses in Professional Degree Programs

Students may include in their programs of study certain professional degree courses offered by other Schools in the university. They register for these courses through the Graduate School and often do additional work appropriate for a research degree. Six hours of such credit may be applied to a master's degree program and 12 hours to a Ph.D. program. Students

must obtain written approval from their adviser, from the other School, and from the Graduate School. The courses may constitute part of the major or minor field, as approved by the student's adviser.

Individualized Programs

Students with special course goals should inquire in the Graduate School Office about the possibility of individualized, interdisciplinary programs of study leading to the master's and Ph.D. degrees. The Graduate School may permit programs that combine several disciplines in unique ways. Financial support for individualized programs must be arranged with specific faculty members as there are no program or departmental financial awards available.

Master's and Ph.D. students may not apply for admission to the individualized program until they have been admitted to and enrolled in a department currently offering that degree. Except under extraordinary circumstances, interested students will be expected to apply, or make preliminary inquiry, to the Graduate School during their first year of graduate studies.

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

The College of Arts and Science offers students in most 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 ofArts 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 Integrated 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 Integrated 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 Chemistry, English, French, German, History, Jewish Studies, Mathematics, Philosophy, Political Science, and Religion. Students are welcome to discuss the Integrated B.A./M.A. (4+1) option with any of these departments and programs. Other departments and programs are expected to participate in the 4+1 option at a later date.

Admissions Overview

The Integrated B.A./M.A program allows Vanderbilt University students to study for both degrees often, 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 appropriate adviser for post-baccalaureate programs, and then submit to the prospective graduate department or program 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 *www.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.

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 this program must satisfy all requirements for both degrees. Advanced Placement (AP) credits will often be used toward satisfying a comparable number of 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. 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 nonthesis 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 thr ough student loans and other financial aid.

A limited amount of scholarship funds is available in support of a small number of 4+1 students in the fifth year of study. Any student accepted into this program who wishes to be consider ed should consult the associate dean for post-baccalaureate programs.

For additional information, contact Associate Dean Martin Rapisar da, *martin.rapisarda@vanderbilt.edu*, or consult the Web site at *www.vanderbilt.edu /cas/4plus1*.

Summer Session

Information concerning the summer session may be obtained on request from the Graduate School of fice. A summer session announcement containing a list of summer courses and a tentative schedule is available in mid-March of each year.

Admission

QUALIFIED applicants with bachelor's degrees are eligible for admission to the Graduate School. Admission is competitive and students are selected on the basis of their scholastic preparation and intellectual capacity.

Generally, minimum requirements for admission are these: an applicant should have completed or soon will complete a course of study equivalent to that required for the bachelor's degree at an accredited institution, maintained a minimum of a *B* average in undergraduate work, and maintained a *B* average in the field of expected graduate concentration. Individual programs in the Graduate School have additional requirements for admission.

Application for admission may be made electronically through the Graduate School Web site (*www.vanderbilt.edu/gradschool*). Those unable to use our online application should contact the Graduate School for a printable application. There is no application fee for electronic applications.

The deadline by which the completed application for fall admission and all supporting credentials should reach Vanderbilt is January 15. Some programs observe an earlier deadline. Applicants should verify the deadline for the program to which they wish to apply by checking the Web site for that department or program. Admission decisions for fall semester will be mailed by March 31 to all applicants whose files are complete by January 15.

The deadline for responses to offers of financial award is April 15. If your reply is not received by April 15, the department may rescind the offer of financial award.

Most departments do not admit students for the spring semester. Please check with the department in which you are interested before applying for spring semester admission.

Students seeking admission for the spring semester should file applications no later than November 1. Decisions are announced before December 1.

Further information regarding the application and admissions process is available at *www.vanderbilt.edu/gradschool*.

Graduate Record Examination

Submission of scores on the General Test of the Graduate Record Examination (GRE) is required as part of the application to the Graduate School. Some departments also require a report of the score on the Subject Test of the GRE before an application will be considered.

Information concerning the GRE may be obtained from Graduate Record Examinations, Educational Testing Service, Box 6000, Princeton, New Jersey 08541-6000, U.S.A., or the GRE Web site at *www.gre.org*.

Master of Liberal Arts and Science

Candidates for admission to the M.L.A.S. degree program must present to the Graduate School a formal application, two letters of recommendation, a short essay on "Why this degree? Why now?" and a transcript indicating a completed course of study equivalent to that required for a bachelor's degree at an accredited institution, with a minimum of a *B* average in all undergraduate work (or significant life/work achievement that could compensate for a lower grade point average). Graduate Record Examination scores are not required. After receipt of all materials, the director of the program will interview all prospective students.

International Students

Vanderbilt has a large international community representing approximately one hundred countries. The university welcomes the diversity that international students bring to the campus and encourages academic and social interaction at all levels. International applicants who are offered admission will be contacted by Vanderbilt's Office of International Student and Scholar Services (ISSS) with instructions for initiating the visa process.

English Language Proficiency. Proficiency in written and oral English is required for enrollment in an academic program. Applicants whose native language is not English must present the results of the Test of English as a Foreign Language (TOEFL) with the application, unless they have demonstrated competence while attending an American or English-speaking institution. International students transferring from unfinished degree programs of other universities in the United States should present TOEFL scores. The International TOEFL is administered at test centers throughout the world at different times during the year. You may access information regarding the TOEFL exam, including registration and sample tests, at *www.toefl.org*. Inquiries and requests for application forms should be addressed to TOEFL, Box 6151, Princeton, New Jersey 08541-6151 U.S.A.

The minimum acceptable score on the paper-based total Test of English as a Foreign Language is 570. The computer-based total acceptable score is 230, and for the new Internet-based test, 88. Many programs, however, require a considerably higher level of proficiency.

English Instruction. Applicants whose proficiency in English is low or marginal may be asked to enroll in an English language program before beginning academic studies. Vanderbilt offers such a program at its English Language Center (ELC). Intensive, semi-intensive, or part-time English study is offered throughout the year. Non-credit enrollment in at least one academic course may be recommended while the student is improving proficiency in English. Academic studies for credit may begin after recommendation by ELC in consultation with the student's academic adviser For more information, write to ELC, Peabody #510, Nashville, Tennessee 37203-5721, U.S.A.; *www.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 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. 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.

Health and Accident Insurance. International students and their dependents residing in the United States are required to purchase the university's international student health and accident insurance plan. No exceptions are made unless, in the judgment of the university, the student provides proof of coverage that is equal to or greater than that in the university-sponsored policy. This insurance is required for part-time as well as full-time students. Information concerning the limits, exclusions, and benefits of this insurance coverage may be obtained from Student Health Services or from International Student and Scholar Services.

Information. Assistance in nonacademic matters before and during the international student's stay at Vanderbilt is provided by International Student and Scholar Services, Vanderbilt University, Student Life Center, 310 25th Avenue South, Suite 103, Nashville, Tennessee 37240, U.S.A.; *www.vanderbilt.edu/isss*.

Financial Information

TUITION in the Graduate School for 2006/2007 is charged at the rate of $1,359 per semester hour with a minimum tuition charge of $200 per semester.

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

A minimum of 24 hours is required for master's degrees (most programs require more hours than this minimum). Seventy-two hours of graduate work at the established tuition rate are required for the Ph.D. Transfer students entering Ph.D. programs should note that a minimum of 24 hours of formal course work must be completed in the Vanderbilt Graduate School.

Students who have completed the hours required and who are conducting research full time, register for thesis or dissertation research without hourly credit and are subject to a minimum tuition charge of $200 per semester.

Master of Liberal Arts and Science Courses

Students in the M.L.A.S. program pay one-half of the regular graduate tuition rate for M.L.A.S. courses and full tuition for courses selected from the regular curriculum. M.L.A.S. course tuition for 2006/2007 is $2,038 per 3-hour course.

Supplemental Tuition and Continuous Registration

Continuous registration is required of all full-time degree candidates until the required number of course work hours have been completed. Responsibility to maintain registration rests with the student. To retain student status, individuals must register each fall and spring semester or secure an approved leave of absence. A person is in student status *only* if:

- registered, or
- on authorized leave of absence

A student who has completed the formal course work required for the degree may, with approval of the student's department and the Graduate School, conduct full-time thesis or dissertation research away from the university and register for research hours needed for the degree. Tuition is charged at the current rate per semester hour, or $200 per semester if the student has completed the hours required for the degree.

In general, individuals who have completed the number of hours required for the degree and who are employed full time are not eligible to

register as full-time students. Such persons pursuing the Ph.D. degree may register as half-time students if they are devoting a minimum of 20 hours per week to dissertation research and their program offers the half-time research course (3995) for a $200 per semester fee.

A former student wanting to re-enter the Graduate School must apply for reinstatement, which is granted only on the recommendation of the student's graduate program and with approval of the Graduate School.

Other Fees

Student health insurance	2,193
Student activities and recreation fees	322
Transcript fee (one time only)	30
Late registration	30
Audit fee for regular students (nonrefundable)	10
Ph.D. dissertation publication (microfilming)	60
Thesis or dissertation binding (per copy)	18
Copyright fee for Ph.D. dissertation (optional)	65

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 16 for the fall semester and January 3 for the spring semester. All 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. Visit our Web site at *www.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 returned by the bank and reserves the right to invoke the laws of the State of Tennessee governing bad checks.

Refunds of Tuition Charges

University policy for the refund of tuition charges provides a percentage refund based on the time of withdrawal. Students who withdraw officially or who are dismissed from the university for any reason may be entitled to a partial refund in accordance with the established schedule shown below. Fees are nonrefundable.

Fall 2006 Withdrawal/Refund Schedule

Week 1	August 23–August 26	100%
Week 2	August 27–September 2	95%
Week 3	September 3–September 9	85%
Week 4	September 10–September 16	80%
Week 5	September 17–September 23	75%
Week 6	September 24–September 30	70%
Week 7	October 1–October 7	60%
Week 8	October 8–October 14	55%

Week 9	October 15–October 21	50%
Week 10	October 22–October 28	45%

No refund after October 28, 2006

Spring 2007 Withdrawal/Refund Schedule

Week 1	January 10–January 13	100%
Week 2	January 14–January 20	95%
Week 3	January 21–January 27	85%
Week 4	January 28–February 3	80%
Week 5	February 4–February 10	75%
Week 6	February 11–February 17	70%
Week 7	February 18–February 24	60%
Week 8	February 25–March 2	55%
Spring Break	March 3–March 10	
Week 9	March 11–March 17	50%
Week 10	March 18–March 24	45%

No refund after March 24, 2007

Tuition Payment Programs

Tuition payment programs are available through Tuition Management Systems (TMS). Pamphlets describing these plans are available on request from the Office of Student Accounts or the Office of Student Financial Aid.

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 with a minimum of $5.00.

Financial Clearance

Current charges can be deferred if a Student Account Agreement is on file in the Office of Student Accounts (the Office of Student Accounts may refuse to allow a deferment if in its judgment the deferment is unwarranted). However, a late payment fee will be assessed each month until the balance is paid. All amounts deferred are due no later than November 30 for the fall semester, April 30 for the spring semester, and July 31 for the May and summer sessions.

No transcript will be issued for a student who has an outstanding or deferred balance. Diplomas of graduating students will be withheld until all bills are paid.

Activities and Recreation Fees

The required student activities and recreation fees entitle degree-seeking students to use the facilities of Sarratt Student Center and the Student Recreation Center. The fees also cover admission to certain social and cultural events and subscriptions to certain campus publications. The activities fee for graduate students also includes funding for activities sponsored by the Graduate Student Council. Specific information on

these fees is published annually in the *Student Handbook.* By payment of an additional fee, students and their spouses may use their identification cards for admission to athletic events.

The student activities fee and the student recreation fee will be waived automatically if the student is a *part-time* student registered for four or fewer semester hours and not registered in a thesis or dissertation research course, or if he or she resides, while a student, beyond an approximate sixty-mile radius from the campus as determined by ZIP code. Students who register late or students who want to have fees waived due to exceptional circumstances must petition for a waiver through the Office of Student Athletics, Recreation, and Wellness, VU Station B #356206, 2301 Vanderbilt Place, Nashville, Tennessee 37235-6206. A $10 charge is assessed for processing the waivers of students who register late.

Transcripts

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

Honor Scholarships

Harold Stirling Vanderbilt Graduate Scholarships and University Graduate Fellowships

Each year several Harold Stirling Vanderbilt Graduate Scholarships and University Graduate Fellowships are awarded to students entering a Ph.D. program for the first time. Based solely on merit, they are offered to students nominated by departments or programs in recognition of exceptional promise for research and academic excellence. They are tenable for the duration of the initial departmental award if the holders continue to fulfill the high promise for which they were chosen.

Harold Stirling Vanderbilt Graduate Scholarships. These scholarships provide a stipend of $3,000 per year in addition to regular assistantship or fellowship awards. The Graduate Faculty Council reviews nominations from all graduate programs and makes its recommendations to the Graduate School which then selects the recipients.

University Graduate Fellowships. These premier fellowships provide a stipend of $5,000 in addition to a department's best award (fellowship or assistantship). Recipients are selected in the same manner as for the Harold Stirling Vanderbilt Graduate Scholarships.

Provost's Graduate Fellowships

Each year the Graduate School awards Provost's Graduate Fellowships to outstanding students from under-represented groups showing academic promise, who intend to teach at the college or university level, and who want to study for the Ph.D. These fellowships carry a stipend of

$16,500 for the 2006/2007 academic year and provide tuition and fees. Support is provided for five years with teaching duties required during the third year of study.

Other Awards and Assistantships

The university intends, within its resources, to provide adequate financial assistance to students with high academic potential who need help in meeting expenses. Some support is service free; most requires assigned service to the university. Duties are compatible with the student's development and progress.

All applicants to the Graduate School are considered for awards and assistantships available in their proposed area of study if they request such consideration and if the application for admission is complete by January 15.

University Fellowships

University fellowships with stipends up to $24,000 are available in some programs. A full Tuition Scholarship is normally provided in addition to the stipend. The fellowships are service-free and the student is expected to devote full time to graduate study and to have no other occupation.

Teaching Assistantships

Teaching assistantships are awarded for the twin purposes of attracting superior students and providing supervised assistance to faculty in the instruction of undergraduate students. Assistants receive a stipend ranging up to $14,000 for nine months or $21,000 for the calendar year and normally receive an additional service-free full tuition scholarship. Duties are assigned by the program director and require up to twenty hours of work each week. Appointments are made for one year with renewal in subsequent years dependent upon satisfactory performance of assigned duties, as evaluated by the program director and school deans. Graduate teaching assistants are expected to pursue graduate study full time.

All persons who have responsibility for instruction, including graduate teaching assistants, are subject to university policies as outlined in the *Faculty Manual,* and any additional school and departmental policies that govern instruction. Graduate teaching assistants with major instructional responsibilities must have a master's degree or the equivalent.

Research Assistantships

Research assistantships ranging up to $22,000 for twelve months are available in many graduate areas. The holder is expected to assist an individual faculty member in research. Full or partial tuition scholarships may accompany a research assistantship.

Traineeships

Traineeships ranging up to $21,000 for twelve months are available in many graduate programs. The recipient is expected to carry out research with an individual faculty member. Full or partial tuition scholarships usually accompany a traineeship.

Tuition Scholarships

Some departments or programs (e.g., the Graduate Department of Religion, programs in the School of Engineering, Hearing and Speech Sciences) offer service-free full or partial tuition scholarships without an accompanying fellowship or assistantship.

Teacher Training Awards

A number of 50 percent tuition awards are available to candidates for the Master of Arts in Teaching degree. In addition, some programs offer fellowships or assistantships as well as service-free tuition scholarships to M.A.T. students.

Other Graduate Fellowships

Various types of financial assistance other than university assistantships and fellowships are available. A number of private foundations and business and industrial firms support fellowships. The U.S. Government provides training grants for Ph.D. programs through the U.S. Public Health Service, the National Institutes of Health, and other agencies. Awards are allocated to specific departments and to interdepartmental graduate programs of study. Traineeships provide stipends up to $21,000 for the calendar year and cover tuition and fees.

Loan Assistance

Loan assistance is available for graduate students in the form of subsidized and unsubsidized loans through the Federal Stafford Loan program, the Federal Perkins Loan program, and certain alternative/private loan programs. Beginning July 1, 2006, graduate/professional students can borrow through the Federal Graduate PLUS Loan program. Eligibility for the Federal Subsidized Stafford Loan and Federal Perkins Loan is based on financial need, but the Federal Unsubsidized Stafford Loan is available regardless of need. However, students are required to complete the need-based application process before a Federal Unsubsidized Stafford Loan may be awarded. The Federal Graduate PLUS Loan is not based on demonstrated need, but the student must be credit worthy. Alternative/private loans are available from private sources that are not based on financial need. We recommend that students apply for federal loans first and then pursue additional sources of funding if necessary.

Under the Federal Perkins Loan program, a graduate student may borrow up to a maximum annual limit of $6,000, and the maximum aggregate amount of loans an eligible student may borrow is $40,000, including any Federal Perkins Loans borrowed for undergraduate study. Under the Federal Stafford Loan program, a student may borrow up to a maximum annual limit of $18,500 a year ($8,500 subsidized and $10,000 unsubsidized). The maximum aggregate amount of loans an eligible student may borrow is $138,500 ($65,500 subsidized and $73,000 unsubsidized), including any Federal Stafford Loans borrowed for undergraduate study. Under the Federal Graduate PLUS Loan program, a graduate/professional student may borrow up to the annual cost of attending Vanderbilt minus any other aid for which the student is eligible. There is no maximum aggregate limit.

In order to be considered for the Federal Stafford Loan programs, Federal Perkins Loan, Federal Graduate PLUS Loan, and/or the Federal Work-Study program, students must complete the Free Application for Federal Student Aid (FAFSA) and the Vanderbilt Graduate and Professional Financial Aid Application. Both applications and additional information may be found on the Office of Student Financial Aid Web page, *www.vanderbilt.edu/financialaid/gradprof.htm*.

Gateway

Academic Regulations

VANDERBILT'S students are bound by the Honor System inaugurated in 1875. Fundamental responsibility for the preservation of the system inevitably falls on the individual student. It is assumed that students will demand of themselves and their fellow students complete respect for the Honor System. All work submitted as a part of course requirements is presumed to be the product of the student submitting it unless credit is given by the student in the manner prescribed by the course instructor. Cheating, plagiarizing, or otherwise falsifying results of study are specifically prohibited under the Honor System. The system applies not only to examinations but also to written work and computer programs submitted to instructors. The student, by registration, acknowledges the authority of the Graduate Honor Council.

The university's Graduate Student Conduct Council has original jurisdiction in all cases of non-academic misconduct involving graduate and professional students.

Students are expected to become familiar with the *Rules Governing the Graduate Honor Council of Vanderbilt University,* available at the time of registration. It contains the constitution and bylaws of the Graduate Student Honor Council, Appellate Review Board, and related regulations.

Detailed descriptions of Honor System violations and procedures are also available on the Web at *www.vanderbilt.edu/gradschool*.

Academic Requirements

Candidates for graduate degrees must have satisfactorily completed all residency, academic course, and thesis or dissertation requirements, have passed all prescribed examinations, and be free of indebtedness to the university at the time of graduation.

The academic requirements described on the following pages have been established by the Graduate Faculty and are applicable to all graduate students at Vanderbilt.

Individual degree programs may have additional requirements. Students are advised to refer to the various program descriptions listed in this catalog and to consult their major advisers for requirements in the specialty of interest.

Students who were completing undergraduate or advanced degrees at the time of their admission must provide to the Graduate School, before initial registration, an official final transcript showing that the degree has been received and the date it was granted.

Intent to Graduate

An Intent to Graduate form must be submitted to the Graduate School at the beginning of the semester in which the student expects to receive a degree. Students should check the University Academic Calendar each semester to determine deadline dates. Intent to Graduate forms are available in the Graduate School office and at the Graduate School Web site, *www.vanderbilt.edu/gradschool*.

Requirements for the Master's Degree

The following master's degrees are awarded in the Graduate School: Master of Arts, Master of Science, Master of Fine Arts, Master of Arts in Teaching (for secondary school teachers), and Master of Liberal Arts and Science. Students should check regulations of their particular program; many have requirements in addition to those listed here.

Residence

The candidate for the master's degree shall spend at least one academic year of graduate study at Vanderbilt. Candidates for the master's degree are expected to be enrolled in the Graduate School during each fall or spring semester until completion of degree.

Course Work

A minimum of 24 semester hours of formal, didactic course work is required for the master's degree. The courses may be divided between major and minor subjects. If there is a minor subject, it consists of courses outside the major, or it may center on a second area of interest within the major. Approved subjects and the proportion of the 24 hours allotted to each are specified by each program. All requirements for the master's degree must be completed within a six-year period calculated from the student's first semester of enrollment in the Graduate School. International students should contact the Office of International Student and Scholar Services concerning time limitations for completion of master's degrees.

On recommendation of the student's program and approval of the Graduate School, credit up to 6 semester hours toward the master's degree may be transferred from graduate schools in accredited institutions, or other Schools of the university.

An incoming graduate student deficient in areas the major department considers prerequisite to a graduate program shall take such course work without graduate credit, in addition to the courses required for the advanced degree.

Thesis

The candidate shall submit two copies of the thesis to the Graduate School no later than the fourteenth day before the end of the term in which the degree is to be received except for the spring term; a candidate who expects to graduate in May must submit the thesis to the Graduate School no later than April 2, and if submitting electronically, no later than

March 19. Due dates are listed on the Graduate School Web site and on page 6 of this catalog. The thesis is in addition to the 24 hours of course work required for the degree, and must give evidence of original investigation in the major subject. The title page of the thesis must bear the signatures of at least two graduate faculty members in the student's program. Each copy must bear original signatures; duplicated signatures are not permitted. A $36 fee is required for the binding of two copies of the thesis ($18 per copy). Detailed instructions as to the form in which the thesis is to be submitted are available at *www.vanderbilt.edu/gradschool*.

The candidate shall furnish a thesis abstract of not more than two hundred fifty words.

Non-Thesis Programs

Non-thesis master's degree programs offered in anthropology, classics, computer science, economic development, environmental engineering, French, geology, German, hearing and speech sciences, Latin American studies, liberal arts and science, mathematics, political science, Portuguese, religion, sociology, and Spanish specify additional course work up to at least 30 hours. Some programs also require an examination in addition to the 30 hours in lieu of a thesis. Not later than fourteen days prior to the end of the term, the student's department will verify that all degree requirements have been completed.

Master's Degree in Passing

Certain departments offering the Ph.D. degree allow, as an alternate to the master's thesis requirement, passing the Ph.D. qualifying examination and the completion of at least 42 hours of graduate study. Students should consult the chairs of their departments or with their graduate advisers to determine whether such an optional plan is available in their program.

Final Examination

The candidate for the master's degree may, at the discretion of the program faculty, be required to take a final examination in the field of specialization. Such examination shall be completed not later than fourteen days before the end of the term in which the degree is to be granted.

Requirements for the M.L.A.S. Degree

A minimum of 27 semester hours of academic credit (nine courses) is required, with at least six M.L.A.S. courses (18 hours) and the option of selecting the remaining three courses (9 hours) from the regular course offerings available to graduate students. While students may elect a non-thesis program, a 6-hour thesis option is available as the final hours earned for the degree. Students normally take only one course each semester. All work must be completed within six years of the initial registration. A maximum of 6 credit hours may be transferred from graduate schools of other accredited universities and will count as part of the 9-hour non–M.L.A.S. course work.

Curriculum

A range of courses is offered from the disciplines of the liberal arts, including core courses for beginning students and selected topics courses, available to students after successful completion of two core courses. When nine M.L.A.S. credit hours have been earned, students may select up to three courses offering graduate credit from the regular schedule of courses (M.L.A.S. discount tuition does not apply to the courses from the regular schedule).

Requirements for the Ph.D. Degree

The degree of Doctor of Philosophy is awarded in recognition of high attainment in a special field of knowledge, as evidenced by examination and by a dissertation presenting the results of independent research. General requirements are listed below. However, in many programs there are additional requirements, and students should carefully check regulations in their particular programs.

Admission to Candidacy

Admission to the Graduate School does not imply admission to candidacy for the Ph.D. degree. To be admitted to candidacy the student must satisfy the language requirements, if any, in the program, and must pass a qualifying examination in the major field and, if there is a minor, in the minor subject. The examination will be administered by the student's Ph.D. committee, which will supervise subsequent work toward the degree. Upon completion of these requirements the Ph.D. committee will recommend to the Graduate School that the student be admitted to candidacy.

Residence and Course Work

The Ph.D. degree requires at least three academic years of graduate study. A student must complete 72 hours of graduate work for credit, of which a minimum of 24 hours in formal, didactic course and seminar work in the Vanderbilt Graduate School is required. In most programs students are required to present considerably more hours in formal course work than the 24-hour minimum. The remainder of the 72 hours, above the program requirements in formal course hours, may be in dissertation research hours, in special readings, and in transfer credit if applicable. Performance in dissertation research does not affect the grade point average.

"Formal, didactic course work" is understood to be approved courses taken for credit other than thesis and dissertation research courses. Students should check departmental regulations for the number of "formal course" hours required for their particular program.

A student's course work may be divided between major and minor subjects. If there is a minor subject, it consists of a series of courses in a field or fields outside the major subject, or it may center on a second area of interest within the major subject. Approved subjects, and the proportion of hours allotted to each, are specified by each program.

All students working full time toward the Ph.D. must register each fall and spring semester. When the required 72 hours of course work have been completed, registration for dissertation research without hourly credit applies; this reflects full-time effort on research and confers full-time student status. The minimum tuition of $200 is charged.

Qualifying Examination

The purpose of the qualifying examination is to test the student's knowledge of the field of specialization, to assess familiarity with the published research in the field, and to determine whether the student possesses those critical and analytic skills needed for a scholarly career.

The examination is conducted by a Ph.D. committee appointed by the Graduate School on advice of the chair or director of graduate studies of the program. The committee consists of not fewer than four members of the Graduate Faculty. Three of the members must be graduate faculty from within the student's department/program and one from outside the program. Any variation of the committee makeup must be approved by the Graduate School. The committee must be appointed by the Graduate School no less than two weeks before the time the student expects to take the qualifying examination.

The functions of the Ph.D. committee are (a) to administer the qualifying examination, (b) to approve the dissertation subject, (c) to aid the student and monitor the progress of the dissertation, and (d) to read and approve the dissertation and administer the final oral examination.

The qualifying examination may be administered at any time during the school year and shall be completed within a period of four weeks. Before a qualifying examination can be scheduled, the student must have completed at least 24 hours of graduate work (to include all course work required for the degree) and the language requirement, if any. In some programs the student may be required to demonstrate basic competence in the discipline through a written preliminary examination prior to the actual qualifying examination.

All departments and other units offering Ph.D. programs must set a maximum time limit within which a student, under normal circumstances, is required to take the qualifying examination. That maximum time limit must not exceed eight semesters (preferably fewer) during which the student is registered, starting with his or her first enrollment as a Ph.D. student.

The qualifying examination may be written or oral, or both. The Graduate School must be notified of the time and place of the qualifying examination at least two weeks in advance. The qualifying examination is not a public examination, and voice recordings of it are not permitted. A student is allowed only two opportunities to pass the qualifying examination. The qualifying examination results form, signed by the committee members and the director of graduate studies for the program, shall be forwarded to the Graduate School immediately after the examination.

When the student has passed the qualifying examination, the Ph.D. committee shall recommend to the Graduate School that the student be admitted to candidacy for the degree.

Dissertation

A candidate for the Ph.D. degree must present an acceptable dissertation within the major field of study. The dissertation demonstrates that the candidate has technical competence in the field and has done research of an independent character. It must add to or modify what was previously known, or present a significant interpretation of the subject based upon original investigation. The subject of the dissertation must be approved by the student's faculty adviser and Ph.D. committee.

The dissertation must be completed within four years after a student has been admitted to candidacy for the degree. Upon petition to the Graduate School, a one-year extension of candidacy may be granted. If such a period has expired without successful completion of the dissertation, the student may be dismissed from the Graduate School. Readmission to the Graduate School, and to candidacy, requires application to the Graduate School, with approval of the program faculty. In such cases the student may be required, by the Graduate School or by the Ph.D. committee, to demonstrate competence for readmission by taking a qualifying examination or additional course work.

The candidate submits two or more copies of the completed dissertation to the Ph.D. committee at least two weeks prior to the dissertation defense. The committee reviews the dissertation and conducts the final examination.

Final copies of the approved dissertation may be submitted to the Graduate School in electronic or printed form. Style specifications, paper requirements, fees, and further details are listed at *www.vanderbilt.edu/gradschool*. With either option, two copies of the title page, with the original signatures of not less than a majority of the Ph.D. committee, and two copies of an abstract of not more than three hundred fifty words, signed by the student's adviser, must be turned in to the Graduate School no later than two weeks before the end of the term in which the student expects to receive the degree, except for the spring term. A candidate who expects to graduate in May must submit two printed copies of the dissertation to the Graduate School by April 2. Students who submit their dissertations electronically revise the title page, convert the documents to a PDF file, and upload the document on the Electronic Theses and Dissertations (ETD) Web site, *http://etd.library.vanderbilt.edu*. Electronic dissertations for May graduates are due March 19.

All dissertations/theses are microfilmed. Microfilming does not preclude publication by other methods, but microfilming is tantamount to publication and a microfilmed dissertation, if not copyrighted, is in the public domain and may not subsequently be copyrighted in its original form. The Graduate School will obtain a copyright for students who wish to have their dissertation copyrighted. Microfilming, binding, and copyright fees must be paid at

the time the dissertation is turned in to the Graduate School. The abstract is published in *Dissertation Abstracts,* which publicizes the completion of the dissertation and announces its availability on microfilm.

Final Examination

The candidate must pass his or her dissertation defense at least fourteen days before the end of the term in which the degree is to be conferred, or by April 2 for May graduation. The final oral examination is administered by the student's Ph.D. committee and is on the dissertation and significant related material; the student is expected to demonstrate an understanding of the larger context in which the dissertation lies. The public is invited to attend the final examination, which is announced in advance in Vanderbilt's electronic calendar.

The requirement for the final examination can be waived only on the written approval of the department, the Ph.D. committee, and the Graduate School.

The chair of the Ph.D. committee or the director of graduate studies of the program, after consultation with the candidate, shall notify the Graduate School in advance of the place and time of the examination and the title of the dissertation. This should be done no later than two weeks prior to the examination. The Graduate School then formally notifies the Ph.D. committee and submits the defense notice to Vanderbilt's electronic calendar. The dissertation defense results form, signed by the committee members and the director of graduate studies for the program, should be forwarded immediately to the Graduate School.

Further Requirements

It should be understood that the requirements stated above are minimum and that individual programs may add others. Students are urged to consult individual program entries in this catalog and departmental chairs and directors of graduate studies to learn the requirements of programs in which they are interested.

Language Requirements for the Master's and Ph.D. Degrees

The language requirements, if any, for the master's and Ph.D. degrees in each graduate program are determined by the program faculty, and are set forth in this catalog in the section devoted to program descriptions and course offerings.

Foreign language requirements are usually met by demonstration of proficiency in one or more of the following: French, German, or Spanish. Certain programs either permit or require proficiency in other languages; and some others restrict the choice to certain combinations within this group. Students should refer to the various program statements in this catalog and should consult their advisers regarding specific requirements.

Examinations in languages are usually administered by the appropriate language faculty by arrangement with the program. As an alternative to

certification of proficiency by examination, the Graduate School may accept certification from the program that the minimum requirement in a language has been met if the student is able to present an acceptable academic record of the equivalent of at least 12 semester hours in the language.

A student who has fulfilled the language requirement at another graduate school prior to entering Vanderbilt may, at the discretion of the program and the Graduate School, transfer the certification if the student does so within three years after having received it.

International students may petition the Graduate School through the program to substitute their native language for one of the usual languages required for the Ph.D. degree.

Registration

The normal academic, full-time registration is 9 to 13 hours per semester (6 to 9 hours in the summer). Students registered for 9 or more didactic hours per semester are defined as full time. Those registered for 6–8 didactic hours are half-time, and those registered for less than 6 hours are part time. After completing the hourly requirements for the degree, full time students register for master's (369) or Ph.D. (399) research without hourly credit to reflect full-time effort on research. Certain programs offer a half-time Ph.D. research course (3995) for students who are able to devote only half-time effort to dissertation research.

During each semester currently enrolled students are asked to meet with their advisers and directors of graduate studies to plan their schedules for the coming semester. All students must later complete official registration at the appropriate time using OASIS (Online Access to Student Information Systems). At the beginning of each semester and the summer session, students must validate their registration by submission of an online registration data form. A late registration fee of $30 is charged to students who fail to register on the stated registration dates.

All full-time graduate students must register each fall and spring semester with no breaks in registration to remain in good standing. In addition, all graduate students receiving scholarship, assistantship, fellowship, or traineeship support through the university must be registered each fall and spring semester as well as summer sessions in which they receive support.

Changes in Registration

Changes in registration may be made through OASIS during the change period (the first ten class days of the semester) with consent of the major department. A student is not permitted to add or drop a course, change the number of hours in a variable-credit course, or change from audit to credit status after the end of the change period. A student may formally withdraw from a course after the end of the change period with the permission of the department, and a grade of *W* will be given. After the mid-point of the semester, a student is not permitted to withdraw from the course without withdrawing from the Graduate School. Students should note, in the

section on tuition and fees, the regulations concerning tuition obligations for courses dropped after the first week of the term.

Courses in which there is a significant change in subject matter each semester (e.g., special topics courses), may be repeated for credit within limits noted in the course listings of this catalog.

Grading System

The grading system in the Graduate School includes the letter grades *A, B, C, D,* and *F*. A student will not be granted graduate credit for any course in which a grade less than *C* is received. Grades below *C* may be repeated once at the discretion of the course director and the department. In this situation, the more recent grade will be calculated in the final grade point average. The letter *I* may be used at the discretion of the instructor in those cases in which the student is not able to complete work in the normal time. The notation *W* is entered onto the transcript when a student withdraws from a course or from the Graduate School. A grade point average of 3.0 is required for graduation.

Letter grades are assigned grade point values as follows:

A+	= 4.0	C	= 2.0
A	= 4.0	C–	= 1.7
A–	= 3.7	D+	= 1.3
B+	= 3.3	D	= 1.0
B	= 3.0	D–	= 0.7
B–	= 2.7	F	= 0.0
C+	= 2.3		

Students receive grades in all courses except those approved for credit/non-credit, audits, and some seminars. An *I* that is not replaced by a letter grade within one year may be changed to the grade *F* at the discretion of the instructor; otherwise, the *I* automatically becomes permanent and remains on the transcript as such.

Certain courses approved by the graduate faculty for credit/non-credit or Pass/Fail count toward total hours. Courses that are strictly no-credit, however, do not count toward total hours or in calculating grade point average, although grades for such courses are entered on the student's record.

With the instructor's permission, students are permitted to audit certain courses. Students who audit are expected to attend the course regularly. Students must be registered for regular courses in order to audit. Audits are listed on the student's transcript. Audits are limited to two per semester.

Grade Change Policy

For a student enrolled in the Graduate School, a grade recorded in the University Registrar's Office may be changed only upon the written request of the instructor, endorsed by the appropriate official (usually an associate dean) within the school/college that offered the course, and then the approval of the associate dean of the Graduate School. An instructor's

petition to change a grade must include a brief rationale for the change. Changing a recorded grade is a serious matter and, in general, petitions will be approved only upon certification that the original grade was in error or, in the case of an Incomplete, that the outstanding requirement(s) have been completed. Request for exceptions to this policy should be directed to the associate dean of the Graduate School and will be considered on an individual basis; these may require additional certifications and approvals.

Academic Probation

A grade point average of 3.0 is necessary for graduation. Students who fall below an average of 3.0 are placed on probation for one semester. If the student's performance does not improve during that semester, the Graduate School and the appropriate department chair will decide whether to dismiss the student or to allow the continuation of probation. If at the end of the second semester the grade point average is still below 3.0, the student may be advised to withdraw or face dismissal. Students who earn a grade point average of 2.0 or less during their first semester of residence are subject to dismissal at the end of that semester.

Student Grievances and Appeals

Students who believe their academic performance has not been judged reasonably or fairly should discuss their concerns with the director of graduate studies in their program or, as necessary, the chair of the department. If the student's concerns cannot be resolved at the program or departmental level, the student may then request a further review of the issues in question by the associate dean for graduate studies or similar official in their school dean's office. The student may appeal the outcome of the school-level review to the Graduate School.

Credit

Courses not listed in this catalog that are numbered in the 200s and 300s may be taken for credit by graduate students on the recommendation and consent of the faculty adviser and the director of graduate studies, unless some limit is noted in the description. Not all courses offered by various divisions of the university in the 200 and 300 numbered series have been approved by the Graduate Faculty for graduate credit; the same is true of four-digit numbered courses in religion (Divinity). In arranging schedules, students should consult their advisers and carefully check the Graduate School catalog for approved courses.

Students may register for graduate courses or other courses in the university on a non-credit basis—either to fulfill their own interests or to meet certain prerequisites and requirements. The designation "no-credit" presupposes the student's participation in the course, including written assignments and examinations. Grades are received and recorded in no-credit courses and tuition is billed at the regular hourly rate.

Transfer Credit

Graduate credit may be transferred from graduate schools in accredited institutions. Students should not assume that all graduate credit earned at other institutions will be transferred. Transfer is made on the recommendation of the chair or director of graduate studies of the major department and approval of the Graduate School.

Only those hours in which the student has achieved the grade *B* or its equivalent will be considered for transfer. Grades earned on transferred credit do not affect the student's Graduate School average.

A maximum of 6 semester hours of transfer credit may be applied toward the master's degree and, in very special cases, 48 hours toward the Ph.D. (See requirements for the master's degree and Ph.D. degree elsewhere in this catalog.)

Students who want to transfer to the Graduate School from professional degree programs offered by other schools at Vanderbilt must submit a formal application for admission and are expected to do so not later than the end of their first year of graduate-level studies at Vanderbilt.

The Graduate School does not transfer courses taken by students while registered in the university's Division of Unclassified Studies, no matter what the level of the course.

Special Students

Non-degree students may register for selected courses in areas where they are qualified. Such students must submit an application and transcript(s) of their previous academic work with the Graduate School. Approval of the instructor, the department in which the course is offered, and the Graduate School is required. GRE scores are not required. Status as a non-degree student is expected to last no longer than one year. No more than 6 semester hours earned as a non-degree graduate student may be applied to graduate degrees at Vanderbilt.

The Graduate School also accepts as transient students graduate students enrolled in other universities. Such students may obtain graduate credit for transfer or to meet requirements in their home institution. Transient students are normally not admitted to the university for more than one year and are not candidates for a degree. Prior to enrollment, transient students must submit an application, a transcript of their previous academic record, and a letter of good standing from the institution in which they are enrolled.

Leave of Absence

The Graduate School requires continuous registration except for summer sessions. Students who want to interrupt their graduate study must apply to the Graduate School and receive an authorized leave of absence. Leave of absence is granted for a maximum of one year. Those without authorized leave who do not register are dismissed from the Graduate School and are not considered students. If they want to resume graduate study at Vanderbilt, they must apply for reinstatement.

Withdrawal

Students who intend to withdraw from the university should inform the Graduate School in writing. Improper notification may result in loss of credit or other financial penalties.

Credit for Graduate Courses Taken as an Undergraduate

A qualified Vanderbilt University senior undergraduate may enroll in graduate courses and receive credit which, upon the student's admission to the Graduate School, may be applicable toward a graduate degree. Undergraduate seniors interested in this option should review the regulations appearing in the *Undergraduate Catalog* and consult their advisers and the Graduate School. Undergraduates should note that those wanting to take 300-level courses, whether under this option or not, must obtain the written approval of their academic adviser, the instructor of the course, and the Graduate School.

In certain special cases, credit may be transferred for graduate-level course work completed during undergraduate degree studies by a student at another accredited institution. The course hours must be in excess of the minimum required for the undergraduate degree and the course(s) must not be a required part of the undergraduate degree or major. Requests for such transfer of credit must be carefully justified by the student's major department and approved by the Graduate School.

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. Students unable to participate in the graduation ceremony will receive their diplomas by mail.

Courses of Study

THESE listings give faculty, programs, and course offerings of the various departments and programs offering graduate instruction. The names and ranks of faculty members engaged in graduate instruction are shown with these department and program listings.

Explanation of Symbols

200-level courses listed in this catalog may be taken by graduate students for credit unless a specific restriction is indicated in the course description and provided there is no duplication of the student's previous courses.

300-level courses are graduate courses. They are on a level normally considered too high for undergraduates and are not open to undergraduates without consent of the instructor, the adviser, and the Graduate School. Courses in the graduate program in religion carry four-digit numbers. Generally, courses in religion numbered greater than 3000 are at a higher level than those numbered 2000.

Length of a course (one semester or two) is indicated by whether it has a single or double number. Double-number courses may be divided at the option of the student if the numbers are *different.*

210–211. Note that numbers are different, indicating that students may take either semester without the other, at their own option. In the election of such options, students must not disregard statements of prerequisites or the major department's requirements.

220a–220b. Note that numbers are the same, indicating a year-long course.

The semester in which a one-semester course is offered is indicated by the word FALL (or SPRING) in the course description, or FALL, SPRING in the case of a course offered both semesters. All two-semester courses begin in FALL and end in SPRING unless the course description specifies otherwise.

Hours referred to are semester hours, and figures in brackets always indicate semester hours credit—e.g., 3 for one semester and 3–3 for a two-semester course.

Formal course work means all courses taken for credit except thesis and dissertation research courses.

The university reserves the right to change the arrangement or content of courses, to change texts and other materials used, or to cancel any course on the basis of insufficient enrollment or for any other reason.

Anthropology

CHAIR Tom D. Dillehay
DIRECTOR OF GRADUATE STUDIES John Wayne Janusek
PROFESSOR EMERITUS Ronald Spores
PROFESSORS Arthur A. Demarest, Tom D. Dillehay, Volney P. Gay, Thomas A. Gregor, William L. Partridge
ASSOCIATE PROFESSORS Beth Ann Conklin, Edward F. Fischer, William R. Fowler Jr., John Wayne Janusek
ASSISTANT PROFESSORS Gregory Barz, Francisco Estrada-Belli, Annabeth Headrick, Norbert Ross, Lucia Tanassi, Tiffiny Tung, Steven A. Wernke
RESEARCH ASSISTANT PROFESSOR Patricia Foxen

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

THE graduate program in anthropology is designed to prepare students for careers in teaching and research with an emphasis in specializations on the anthropology of Central America, Mexico, and South America. The graduate enrollment of approximately thirty graduate students assures a close tutorial relationship with faculty and ample student opportunities for field research and publication in Latin America.

Requirements for the master's degree in anthropology include 24 hours of course work, a comprehensive examination, and a thesis. An alternative master's degree track involves 36 hours of course work and a comprehensive examination, rather than a thesis. Although students are expected to acquire a general knowledge of anthropology, the program encourages independent research on special subjects, particularly in archaeology, ethnography, and ethnohistory of Latin America.

The Ph.D. program requires at least 45 hours of formal course work and four semesters of residency. A high level of proficiency in one foreign language is expected. Doctoral candidates pass general examinations, present and defend a dissertation proposal, complete a dissertation on original field or archival research, and defend the dissertation. Subject to the approval of the director of graduate studies, students entering the program with a master's degree or with studies elsewhere may transfer up to 18 hours of graduate credit.

201. Introduction to Linguistics. 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. SPRING. [3] Staff.

203. Anthropological Linguistics. 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] (Not currently offered)

206. Theories of Culture and Human Nature. 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. [3] (Not currently offered)

207. Energy, Environment, and Culture. The relationship between human beings and the environments that sustain them. The 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] (Not currently offered)

209. Human Diversity. The concept of "race." Racial variation and the perception of human differences. The biological basis for human variation. [3] (Not currently offered)

210. Peoples and Cultures of Latin America. Survey of Latin America, including both its native cultures and its Spanish and Portuguese heritage. Fundamental traditions of Latin America, including marriage and the family, the relationship between men and women, racial and ethnic identity, social class, and religion. Special attention to the organization of peasant communities, contemporary urban life, poverty, and economic development. [3] (Not currently offered)

211. Archaeology. 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. SPRING. [3] Fowler.

212. Ancient Mesoamerican Civilizations. 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. FALL. [3] Estrada-Belli.

213. The Archaeology of the Ancient Maya Civilization. The civilization of the ancient Maya peoples, the most advanced culture of the pre-Columbian New World. Lectures and readings cover the archaeological evidence and social theory on the enigmatic origins, complex nature, and sudden collapse of this ancient civilization. [3] (Not currently offered)

214. North American Indians. A comparative survey of the Indian societies of North America, their archaeological origins, development, and changing adaptation to white society over the past four hundred years. [3] (Not currently offered)

216. Ancient Cities. Comparative examination of early cities in the Old World and pre-Columbian America. Analysis of social and economic processes supporting pre-industrial urbanism. Role of geography, ideology, trade, and settlement systems in the rise of early urban societies. FALL. [3] Janusek.

217. Old World Archaeology. 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. SPRING. [3] Estrada-Belli.

218. Reconstructing Prehistoric Economic Systems. Anthropological and economic theory in prehistoric archaeology. Methods for reconstructing prehistoric economic systems. Models for production and exchange. [3] (Not currently offered)

219. Comparative Writing Systems. 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. SPRING. [3] Conklin.

220. Peoples and Cultures of Mexico. Indian, peasant, and urban cultures in Mexico from late pre-Hispanic times to the present. Ethnic and regional diversity, urban-rural relationships, class structure, and national integration. [3] (Not currently offered)

221. Maya Language and Literature. Introduction to a contemporary Maya language. Linguistic analysis and cultural concepts. By permission of instructor. May be repeated once for different language for a maximum of six credit hours. [Variable credit: 1–6] Staff.

222. Anthropologies and Archaeologies of Community. Creation, maintenance, and transformation of communities through time. Discussion of "community" as a village or settlement. SPRING. [3] Wernke.

223. Colonial Encounters in the Americas. Theoretical discussion of colonialism as a socio-cultural 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. SPRING. [3] Wernke.

224. Political Anthropology: Crosscultural Studies in Conflict and Power. Comparative and ethnographic analysis of political and legal systems. Formal and informal means of control in egalitarian and hierarchical societies. Anthropological theories of power, authority, influence, and leadership. Social and cultural dimensions of conflict, consensus, competition, and dispute resolution. [3] (Not currently offered)

225. The Archaeology of Ancient Asia. Development of Asian culture from the Ice Age hunter-gatherers to the first civilizations of China, Japan, Thailand, Indochina, Indonesia, and the Philippines. [3] (Not currently offered)

226. Myth, Ritual, Belief: The Anthropology of Religion. Crosscultural survey of religious and ritual beliefs in the light of theories of religion. Topics include sacrifice, myth, witchcraft, divination, religious change, and millenarian movements. SPRING. [3] Ross.

228. Family, Marriage, and Kin. The family, household, division of labor, and obligations of kinship in non-Western societies. Marriage, age and gender, and kinship networks in relation to economics and political life. Comparisons with kinship in Western cultures. [3] (Not currently offered)

229. North American Archaeology. 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] (Not currently offered)

230. Environment and Archaeology. Human impact on environment, subsistence, and settlement. The contribution of archaeology, geology, and botany to human ecology. [3] (Not currently offered)

231. Archaeology of Africa. Prehistory and history from the emergence of first humans to development of indigenous civilizations and states. Emphasis on Subsaharan Africa, including early hunter-gatherer adaptations, the ecology of pastoralist and agricultural economies, and the rise of socially stratified societies. [3] (Not currently offered)

232. The Anthropology of Globalization. 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. SPRING. [3] Fischer.

233. Culture, Ecology, and International Development. Theories of development and social change in Third World societies. Case studies of development programs in peasant and tribal communities in Asia, Africa, and Latin America. Ecological, social, and political issues in problems of food and agriculture, rain forest development, and grassroots development strategies. [3] (Not currently offered)

234. Economic Anthropology. 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. SPRING. [3] Fischer.

237. Ethnicity, Race, and Culture. Key concepts used in the history of anthropology to explain social diversity; theories of racial typology, cultural traditions, and ethnic identity. Role of rituals and symbols in expressing social identity and group membership. Crosscultural comparison of pluralistic and homogeneous societies. Relation of ethnicity to ties of kinship, language, heritage, religion, and nationality. Changes in interethnic relations through assimilation, acculturation, cooperation, and polarization. [3] (Not currently offered)

240. Medical Anthropology. Bicultural 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. FALL. [3] Tanassi.

241. Peoples and Cultures of Oceania. Cultural adaptations by Melanesian, Polynesian, and Micronesian peoples of the Pacific Islands. Topics include ecology, religion, exchange, warfare, and male/female relationships. [3] (Not currently offered)

243. European Ethnography. Modern cultures and societies of Europe. Comparative survey based on ethnographic case studies; national differences and ethnic minorities; challenges of nationalism and globalization; rural and urban economic adaptations; transition of former socialist states. SPRING. [3] Fischer.

246. Peoples and Cultures of the Andes. 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] (Not currently offered)

247. The Aztecs. 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; ethnographic study of modern descendants of the Aztecs. SPRING. [3] Fowler.

248. Ancient Empires and Civilizations of South America. 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. FALL. [3] Janusek.

249. Indians of South America. Hunters and gatherers, tropical forest peoples, chiefdoms, and great civilizations of native South America. Portuguese and Spanish influences. Emphasis on major anthropological studies and comparisons with other cultural areas. [3] (Not currently offered)

250. Shamanism and Spiritual Curing. A crosscultural inquiry into shamanism and sorcery. Examines altered states of consciousness, hallucinogens, spirit possession, and nontraditional techniques of curing. Contrasts shamanism with Western approaches to curing. Implications for religion, theories of the mind, and dream analysis. SPRING. [3] Conklin.

251. Chiefdoms. The origins, evolution, and organization of the world's chiefdoms and other pre-state societies. The rise of social stratification and political hierarchies. The organization of production and exchange. A comparative perspective with ethnographic, historical, and archaeological evidence. [3] (Not currently offered)

252. Native American Art. The art and aesthetics of native peoples throughout the Americas. The relationship of art to social life, myth, and religion. Changes since contact with European cultures. [3] (Not currently offered)

254. The Inca Empire. 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. SPRING. [3] Janusek.

255. Native North American Art. (Also listed as Art and Art History 255) The art and great aesthetic traditions of the native peoples, emphasizing North America, including the Southwest, Northwest Coast, and the Plains. The relationship of art to social life, myth, and religion. Changes since contact with European cultures. [3] (Not currently offered)

259. Maya Culture and Ethnography. Survey of the different cultural groups of the Maya peoples of Mexico and Guatemala. Comparison of cultural features and social and political history. Relationship of culture and language. Introduction to the Maya language family with a focus on Tzotzil. [3] (Not currently offered)

260. Medicine, Culture, and the Body. (Also listed as History 206) Concepts of the human body from historical and cross-cultural perspectives. Exploration of experiences, representations, and medical theories of the body in birth, death, health, and illness in Western and non-Western societies. Comparison of methodologies of anthropology and history. [3] (Not currently offered)

262. Cognitive Anthropology. A survey of methods and approaches in linguistics and the cognitive sciences. Exploration of culture and thought; how culture affects our ways of reasoning. SPRING. [3] Ross.

263. Myth and Legend: The Anthology of Oral Tradition. Narrative traditions and folklore of Western and non-Western cultures. Myths of world creation, human origins, and transformation. Relationship of myth to dream, historical narrative, and social organization. Myth telling and performance. The structure and theory of myth. [3] (Not currently offered)

264. Human Nature and Natural Law: Perspectives from Science and Religion. Conflicting views on the origins of morality and values. Ethical beliefs as deriving from culture or as reflecting a global human nature. Consideration of human universals such as the incest taboo, marriage and family, and religion. Efforts to interpret values and ethical principles as reflecting human biology and evolution, self-interest, altruism, and cooperation. [3] (Not currently offered)

265. Psychological Anthropology. (Also listed as Sociology 265) How personality and culture affect each other. Socialization and the life cycle, the definition of sex roles, individual psychology and group aggression, religion and group personality, and the nature of mental illness and normalcy in non-Western societies. [3] (Not currently offered)

266. Gender and Cultural Politics. Crosscultural comparison of women's roles and statuses 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. [3] (Not currently offered)

267. Life, Death, and the Human Body. Biological and social perspectives on the human body through the life cycle. Concepts of gender, health, sickness, and the nature of beauty and bodily adornment. The linguistics of body language and language that describes the body. The relationship of body, soul, afterlife, and spiritual beliefs. FALL. [3] Tung.

270. Human Osteology. 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. FALL. [3] Tung.

271. Human Evolution. Structural and behavioral changes in hominids leading to modern *Homo sapiens*. Evolutionary theory, paleontological evidence, and nonhuman primates as the bases for interpreting sequential development of pre-modern humans. Prerequisite: 103. [3] (Not currently offered)

272. Human Variation. Biological differences among contemporary human groups. Adaptational features of humans as biological organisms. Use of biological variation for understanding human history and geographic distribution. [3] (Not currently offered)

273. Primate Evolution. Evolution and diversification of primate order from the first primates to the rise of the Great Apes. Skeletal anatomy, evolutionary theory, and living primates as bases for exploring the development of nonhuman primates. Prerequisite: 103 or 173. [3] (Not currently offered)

274. Health and Disease in Ancient Populations. 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. SPRING. [3] Tung.

275. Sociocultural Field Methods. Research design and proposal writing, access to data, ethical issues, sampling techniques, interviewing questionnaire design and question writing, data analysis. [3] (Not currently offered)

280. Introduction to Geographic Information Systems and Remote Sensing. 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. SPRING. [3] Estrada-Belli.

282. Settlement Patterns and the Human Landscape. Sociocultural processes and human-environment interactions in the formation of landscapes and settlement systems. Relationship of archaeology and cultural anthropology in the understanding of social space, sacred landscapes, urban plans, and historical ecology. Cross-cultural comparisons. Methods of interpretation and quantification. [3] (Not currently offered)

284. Problems in Anthropological Theory. An advanced seminar in anthropological theory: cultural evolution, cultural history, ethnic relations, cultural ecology, archaeological method and theory, social structure, political organizations, religious institutions. FALL. [3] Fowler.

288a–288b. Independent Research. Readings on selected topics (of the student's choice) and the preparation of reports. FALL, SPRING, SUMMER. [Variable credit: 1–3 each semester] Staff.

289. Field Research. Directed field research (on topics of the student's choice). FALL, SPRING, SUMMER. [Variable credit: 1–6 each semester] Staff.

302. Quantitative Methods in Anthropology. Statistical methods for anthropological problem solving. Univariate and bivariate statistics, with selective coverage of more complex multivariate techniques. Use of standard software. [3] (Not currently offered)

303. Seminar in Maya Ethnography. Ethnographic survey of the Maya of Mexico and Guatemala; historical and current data, methods, theories. SPRING. [3] Fischer.

307. Human Variation and Osteology. Survey of physical and genetic variation in modern human populations. Laboratory techniques in osteological analysis. [3] (Not currently offered)

309. Seminar in Culture Ecology. Concepts, theories, and methods of the study of culture ecology. Exploitation of the environment from hunting and gathering bands to industrial states. Role of ecology in the rise, growth, and collapse of complex societies. [3] (Not currently offered)

310. Archaeological Method and Theory. Development of archaeology as a discipline; relationships with anthropology and history; intellectual trends. Prerequisite: consent of instructor. [3] (Not currently offered)

311. Formal and Qualitative Approaches in Anthropology. Introduction to formal and experimental methods in cultural anthropology. Exploration of statistical methods to enhance ethnographic descriptions and the scientific impact of data. [3] (Not currently offered)

314. Seminar in Anthropological Theory I. An advanced consideration of the history of anthropological theory from its origins to the mid-twentieth century. FALL. [3] Conklin.

315. History of Anthropological Theory II. An advanced consideration of the history of anthropological theory from the mid-twentieth century to the present. SPRING. [3] Janusek.

316. Anthropology of Adaptation. Concept of adaptation in anthropology. Method and theory in human ecology and environmental archaeology. [3] (Not currently offered)

317. Seminar in Anthropological Archaeology. Middle range theory, site formation, systematics, subsistence, settlement, social organization, ideology, culture change, processual and post-processual approaches. [3] (Not currently offered)

320. Seminar in Ethnography. Ethnographic method and theory. Techniques of describing and understanding unfamiliar cultures. Prerequisite: consent of instructor. [3] (Not currently offered)

321. Seminar in Social Organization. The study of organization from a comparative perspective. [3] (Not currently offered)

322. Culture, Structure, Personality. Integrative anthropological approaches to human behavior examining symbolism, values, the organization of the group, interaction and psychology. [3] (Not currently offered)

325. The Collapse of Civilizations: General Theories and the Maya Collapse. An advanced consideration of the causes and processes involved in the decline of complex societies. General theory is then illustrated by detailed interactive study of the evidence and interpretations of the collapse of the civilization of the Classic Maya, arguably the New World's most advanced society. A seminar allowing each student to develop and define their own perspective on this major problem in archaeology and social theory. [3] (Not currently offered)

328. Violence and Its Embodiments in the Past and Present. Anthropology and bioarchaeology of violence in ancient and modern communities. Bioarchaeological theory and method to identify trauma and violence against the body. Study of war and other forms of violence, including domestic abuse, ritual battles, corporeal punishment. SPRING. [3] Tung.

329. The Anthropology of Death: Body, Place, and Memory. Cultural responses to death in Western and non-Western societies. Emphasis on issues of how social relations, emotion, and memory are shaped in relation to ideas and practices focused on the body and the significance of places as sites of identity. Theory and perspectives from anthropology, religion, and philosophy. [3] (Not currently offered)

330. Research Design in Anthropology. Research design, formulating research questions, and definition of appropriate data and methods. FALL. [3] Dillehay.

331. Preindustrial Political Systems. History, structure, and change of pre-modern political systems around the world. SPRING. [3] Dillehay.

335. Space, Place, and Landscape. Cross-disciplinary approaches to the significance of space and landscape for human societies in the past and present. [3] Janusek. (Not currently offered)

340. Historical Archaeology. Development, practice, methods, and theoretical perspectives in historical archaeology; relationships between archaeology and history. FALL. [3] Fowler.

349. The Historical Archaeology of Latin America. The study of archaeological, historic, and ethnohistorical materials in examining the conquest, colonization, and pr ocess of culture change in Latin America. [3] (Not currently offered)

350. Seminar in Mesoamerican Ar chaeology. The prehistory of pre-Columbian civilizations of Mexico and Central America. May be repeated for credit if topics are sufficiently different. [3] (Not currently offered)

351. Seminar in Oaxacan Archaeology. The origins of agriculture, rise and fall of Zapotec and Mixtec civilizations, ideology, economics, interregional interaction, and ethnohistory. [3] (Not currently offered)

355. Seminar in Mesoamerican Art. [3] (Not currently offered)

360. Seminar in South American Ar chaeology and Ethnohistory. The prehistory of pre-Columbian civilizations of the Andean and lowland r egions of South America. [3] (Not currently offered)

367. Special Topics. Problems, themes, or issues in anthr opological theory and methods. May be repeated with change of content. FALL, SPRING. [3] Staff.

369. Master's Thesis Research. [0]

399. Ph.D. Dissertation Research.

Arabic

210a–210b. Elementary Arabic. Arabic script, elements of grammar, pronunciation, reading, writing, and elementar y conversation. Arabic cultur e and life thr ough traditional and contemporary texts and audiovisual materials. Thr ee hours of class work per week with an additional two hours a week of individual work in the language laborator y. FALL, SPRING. [4–4] Staff.

220a–220b. Intermediate Arabic. Practice and development of all 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 structur e of complex sentences. Thr ee hours of class work per week with an additional two hours a week of individual work in the language laboratory. Prerequisite: 210b or equivalent cr edit by examination. F ALL, SPRING. [4–4] Staff.

Archaeology

See Classical Studies and Anthropology

Astronomy

See Physics and Astronomy

Biochemistry

CHAIR Michael R. Waterman
DIRECTOR OF GRADUATE STUDIES Scott W. Hiebert
PROFESSORS EMERITI Harry P. Broquist, Frank Chytil, Stanley Cohen, Leon W. Cunningham, Benjamin J. Danzo, Willard R. Faulkner, Robert A. Neal, Oscar Touster, Benjamin J. Wilson
PROFESSORS Richard N. Armstrong, Richard Breyer, Jorge H. Capdevila, Richard Caprioli, Graham F. Carpenter, Walter Chazin, Martin Egli, F. Peter Guengerich, David Hachey, Carl G. Hellerqvist, Scott W. Hiebert, Billy Hudson, Tadashi Inagami, Daniel C. Liebler, Lawrence J. Marnett, David E. Ong, Neil Osheroff, John A. Phillips III, Jennifer Ann Pietenpol, Ned Porter, Charles R. Sanders, Samuel A. Santoro, Virginia L. Shepherd, Conrad Wagner, Michael R. Waterman
RESEARCH PROFESSORS Essam E. Enan, Carol Rouzer
ADJUNCT PROFESSORS Dean A. A. Myles, Marcia Newcomer
ASSOCIATE PROFESSORS Bruce Carter, Thomas N. Oeltmann, James Patton, Paul Voziyan
RESEARCH ASSOCIATE PROFESSORS Pierre Chaurand, Raymond L. Mernaugh, Jarrod Smith, Paul Voziyan
ASSISTANT PROFESSORS Brian Bachmann, David Cortez, Tina Iverson, Diane Keeney, Andrew Link, Zu-Wen Sun, Munirathinam Sundaramoorthy, David Tabb
RESEARCH ASSISTANT PROFESSORS David Blum, Dale Cornett, Gerald Frank, David Friedman, Amy Joan Ham, Joel M. Harp, Norio Kagawa, Galina Lepesheva, Hong-Jun Liao, Zigmund Luka, Laura S. Mizoue, Jeffrey Myers, Larissa Podust, Jashim Uddin

DEGREE OFFERED: *Doctor of Philosophy*

STUDENTS interested in this program participate in the Interdisciplinary Graduate Program in the Biomedical Sciences during their first year (see Biomedical Sciences). The second year of study comprises required and elective course work including Biochemistry 300, 301, 302, 303, 327, 330, 336, 337, 343, 349, and 352 for a total of at least 24 hours of formal course work toward the Ph.D. degree (including sixteen hours in the first year). A thesis-based master's degree is awarded only under special circumstances.

The program offers students fundamental training in biochemical principles and an opportunity to apply such fundamental knowledge to vital biological and medical problems.

The intent of the department is to maintain a small graduate program that emphasizes quality of experience, academic scholarship, and professional achievement. Faculty members are involved in active research programs. Thirty to thirty-five graduate students are generally enrolled. To maintain close student-faculty interaction, only a limited number of students are admitted each year.

Major research efforts are concerned with studies on mechanisms of mutagenesis; cytochromes P450, regulation of expression and mechanisms of detoxification; oxygenase and arachidonic acid biochemistry; vitamin A binding proteins and metabolism and action of vitamin A; proteinase inhibitor structure and regulation; DNA-binding proteins; DNA topoisomerase; biochemistry of epidermal growth factor action; biochemistry and endocrinology of hypertension; intracellular signaling in growth and development; neoplastic transformation by oncogenic transcription factors; cellular responses to DNA damage; chromatin structure and histone modifications; and one-carbon metabolism. These studies use state-of-the-art technology including molecular biology, NMR spectroscopy and x-ray crystallography.

Faculty of the department also participate in inter disciplinary training programs, supported by National Institutes of Health training grants, to offer specialized biochemical training in the areas of molecular toxicology, biochemical nutrition, molecular biophysics, cancer research, reproductive biology, and molecular endocrinology.

300. Introduction to Structural Biology. Introduction to methods to determine the three-dimensional structures of biological macromolecules and macromolecular complexes at or near atomic resolution. Techniques covered include X-ray crystallography, NMR, EPR and fluorescence spectroscopies, cryo-electron microscopy, and computational modeling. Emphasis is placed on practical aspects of each technique and the range of applications for which each technique is applicable. The course is given during the first third of the semester, just preceding Biochemistry 303. SPRING. [1] Chazin and Staff.

301. Molecular Structure and Function. This course considers the use of biochemical methods to answer important questions of function in systems involving two interacting species. Topical examples of protein-protein, protein-ligand, protein-nucleic acid, and nucleic acid-nucleic acid interactions are considered. Each example illustrates the use of multiple complementary approaches, which may include mutagenesis, kinetic, chemical, spectroscopic, and in vitro selection methods. SPRING. [2] Armstrong, Caprioli, Egli, Guengerich, Marnett.

302. Advanced Biochemistry, Cell Biology, and Genetics. Advanced concepts in genetics and cell biology will be reviewed using a combination of lectures based on textbooks and discussion sections based on manuscripts. Prerequisite: IGP core course or consent of instructor. FALL. [3] Carpenter, Hiebert, Cortez, Sun.

303. Biomolecular X-Ray Crystallography. Introduction to the theory and practice of X-ray crystallography for the determination of the three-dimensional structure of biological macromolecules at atomic resolution. Topics to be covered include X-ray diffraction, symmetry and space groups, crystallization, data collection, phasing, model building, refinement and validation. Prerequisite: Biochemistry 300, Introduction to Structural Biology. SPRING. [2] Egli, Eichman, Stubbs, Sundaramoorthy.

321. Biochemistry. This course is designed to familiarize the student with the structure and function of biomolecules and to provide a general understanding of life processes at the molecular level. Topics to be covered include the chemistry, metabolism, and cellular functions of amino acids, proteins, nucleic acids, carbohydrates, lipids, and vitamins. Lectures are supplemented with clinical correlation sessions and small group conferences that serve to integrate and broaden course material and to relate molecular processes to the study of human disease. Prerequisite: permission of course director. FALL. [6] Osheroff.

323. Special Problems and Experimental Techniques. Opportunity to master advanced laboratory techniques while pursuing special problems under direction of individual members of the faculty in areas of their specialized interests. Admission to course, hours, and credit by arrangement. FALL, SPRING, SUMMER. [Variable credit: 1–6] Hiebert.

325. Special Topics in Biochemistry. Introduction to current research through the biochemical literature. Given on an individual basis by arrangement. May be taken more than once, but not for more than 2 hours credit with a single adviser, nor for more than 4 hours total. May be taken concurrently with 323 with a different adviser. Prerequisite: consent of instructor. FALL, SPRING, SUMMER. [Variable credit: 1–2] Carter and Staff.

327. Seminar in Biochemical Literature. Development of skills required for effective oral presentation of research results. Course format includes lectures and student presentation of selections from the current literature. Advanced students may present their own work. Admission to course by arrangement. Prerequisite: a course in fundamental biochemistry. FALL. [1] Ong, Wagner.

330. Scientific Communication. Development of skills in writing grant proposals, based on NIH instructions. The topic of the proposal is open, but usually will be the project selected for the dissertation. Critiques of the individual proposals are provided at scheduled intervals. Students not working for a degree in Biochemistry must have the consent of instructor. SPRING. [1] Ong, Wagner.

336. Biochemical Toxicology and Carcinogenesis. (Also listed as Chemistry 336) Chemical and biological aspects of toxicology and carcinogenesis, including basic principles and mechanisms, metabolism and enzymology, cellular biology, chemistry of reactive intermediates, and a survey of several classes of environmentally important compounds. Prerequisite: organic chemistry and general biochemistry. Three lectures per week. FALL. [3] Armstrong, Guengerich, Liebler, Marnett, Pietenpol, Porter, Stone.

337. Molecular Aspects of Cancer Research. (Also listed as Cell and Developmental Biology 337) A focused series of seminars and discussions to explore the molecular basis of cancer. Seminars rely heavily on extramural speakers with recognized expertise in selected research areas. Discussion sections led by a faculty member follow each series of three to four seminars. Prerequisite: 321. SPRING. [1] Carpenter and Staff.

343. Biomolecular NMR Spectroscopy. Introduction to the theory and practice of Nuclear Magnetic Resonance (NMR) spectroscopy for the study of the structure, dynamics, and biochemistry of biological macromolecules. After introducing the basic concepts of NMR and formalisms for predicting the outcome of experiments, topics to be covered will include multidimensional NMR, scalar and dipolar couplings, chemical exchange, relaxation, resonance assignment strategies, and determination of 3D structures. Prerequisite: Biochemistry 300, Introduction to Structural Biology. FALL. [3] Chazin, Krezel, Sanders, Stone.

349. Graduate Seminar in Molecular Biophysics. (Also listed as Biological Sciences 349) Introduction to research areas of current interest through examination of key publications in the preceding year. The weekly meetings consist of open discussions of assigned readings led by multiple student teams. May be repeated for credit. Prerequisite: consent of instructor. SPRING. [1] Chazin and Staff.

352. Analytical Proteomics. Introduces analytical proteomics methods and approaches through lectures, directed readings, and group and individual data analysis exercises. Topics include (a) characteristics of proteomes and protein diversity, (b) mass spectrometry approaches to protein and peptide analysis, (c) protein and peptide separation methods, (d) bioinformatics tools for identification of proteins from MS data, (e) quantitative proteomics methods, (f) applications of proteomics in common experimental designs, (g) tissue proteome profiling and imaging approaches. SPRING. [2] Chaurand, Ham, Liebler, Tabb, Zimmerman.

369. Master's Thesis Research.

399. Ph.D. Dissertation Research.

Biological Sciences

CHAIR Charles K. Singleton
DIRECTOR OF GRADUATE STUDIES Douglas G. McMahon
PROFESSORS EMERITI Burton J. Bogitsh, Sidney Fleischer, Robert Kral, Oscar Touster, John H. Venable, Dean P. Whittier, Robley C. Williams Jr.
PROFESSORS Kendal S. Broadie, Clint E. Carter, Ellen Fanning, Todd R. Graham, Carl H. Johnson, Owen D. Jones, Wallace M. LeStourgeon, David E. McCauley, Douglas G. McMahon, Terry L. Page, James G. Patton, Charles K. Singleton, Lilianna Solnica-Krezel, Gerald J. Stubbs, Laurence J. Zwiebel
ASSOCIATE PROFESSORS Bruce H. Appel, Kenneth C. Catania, Thomas N. Oeltmann
ASSISTANT PROFESSORS D. Kilpatrick Abbot, Kefyn M. Catley, Brandt F. Eichman, Katherine L. Friedman, Daniel J. Funk, Joshua T. Gamse, Chris Janetopoulos, Daniel J. Kaplan, Andrzej M. Krezel, Manuel Leal, Donna J. Webb
RESEARCH ASSISTANT PROFESSORS Irina Bruck, Jeff Rohrbough, Diane Sepich, Shin Yamazaki, Yao Xu, Daoqi Zhang
SENIOR LECTURERS Steve J. Baskauf, Amanda R. Benson, A. Denise Due-Goodwin, Mark A. Woelfle

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

RESEARCH activities in the Department of Biological Sciences encompass the study of biology at the molecular, subcellular, cellular, organismal, population, and community levels. The faculty have primary research interests in the areas of protein structure and function, protein transport, membrane ion channels and receptors, signal transduction, posttranscriptional control of gene expression, DNA replication and recombination, biological clocks, development, neurobiology, parasitology, insect physiology, ecology and evolution.

Students interested in this program may apply for direct admission in the Biological Sciences graduate program, or they may enter through the Interdisciplinary Graduate Program (IGP) in the Biomedical Sciences (see Biomedical Sciences), and choose Biological Sciences as their home department by the end of the second semester.

The program is designed to lead to the Ph.D. degree; however, M.S. degrees are granted under special circumstances and require a research thesis. The Ph.D. degree requires 72 hours of credit for graduation, including at least 24 credit hours of formal course work with the remainder earned through dissertation research. Credit hours earned in the first year IGP program will be counted towards the required 24 hours of formal course work.

Desirable backgrounds for graduate study in the Department of Biological Sciences, depending upon the specific interests of the student, would be undergraduate programs emphasizing biological sciences, chemistry, mathematics, or physics course work, but students from other disciplines are also eligible.

For more information, visit the departmental Web site, *http://sitemason.vanderbilt.edu/biosci*.

Note: The following courses (described below) are usually not available for graduate credit for students in the Biological Sciences program: 201, 205, 210, 220. Graduate students in biological sciences may take graduate courses in the Medical School departments by arrangement.

201. Introduction to Cell Biology. 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: Biological Sciences 110a–110b. SPRING. [3] Graham, Webb.

205. Evolution. 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. Three lectures per week. No credit for graduate students in biology. SPRING. [3] Funk, McCauley.

210. Principles of Genetics. Basic principles and mechanisms of inheritance are discussed and related to other biological phenomena and problems. Prerequisite: 110a–110b. FALL, SPRING. [3] Staff.

220. Biochemistry I. Structure and mechanism of action of biological molecules, proteins, nucleic acids, lipids, polysaccharides. Enzymology. Carbohydrate metabolism. Prerequisite: 110a–110b and Chemistry 220a–220b. FALL. [3] Krezel, Kaplan.

226. Immunology. 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: 201 or 210. FALL. [3] Carter.

230. Biological Clocks. 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. Not open to students who have taken 115: Biological Clocks and Human Behavior Prerequisite: 110a–110b. FALL. [3] McMahon.

237. Ecology Lab. One three-hour laboratory and discussion period or field trip per week. Prerequisite or corequisite: 238. SPRING. [1] Due-Goodwin.

238. Ecology. Population biology, evolutionary ecology, community structure, with emphasis on species interactions, including competition, predation, and symbiosis. Prerequisite: 110a–110b. SPRING. [3] Abbot.

239. Behavioral Ecology. An evaluation and synthesis of some of the important problems at the interface of behavior and ecology. Evolution of society, kin selection and altruism, behavioral mechanisms of population regulation and competition, foraging theory, behavioral aspects of predator-prey interactions, courtship and mating systems, sociobiology and its implications. Three lectures and one discussion period per week. SPRING. [4] Leal.

243. Genetics of Disease. Application of genetics, cell biology, and molecular biology to the study of human diseases. Genomics, gene mapping, and molecular techniques. Animal models of disease. Chromosomal abnormalities, single-gene and multifactorial diseases, and epigenetics. Prerequisite: 210. FALL. [3] Gamse.

246. Evolutionary Genetics. Fundamentals of population and quantitative genetics. Natural selection, gene flow, genetic drift, population structure, linkage disequilibrium and the analysis of polygenic traits, including genetic map-based approaches. Special emphasis will be given to the genetics of adaptation and speciation. Prerequisite: 205 and pre- or corequisite 210. [3] (Not currently offered)

247. Molecular Evolution. 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: 210 and 205. [3] (Not currently offered)

252. Cellular Neurobiology. 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: 110a–110b. FALL. [3] Page.

254. Neurobiology of Behavior. 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: 110a–110b. FALL. [3] Catania.

256. Molecular Neurobiology. Comparative, evolutionary perspectives of molecular mechanisms underlying the development of neural circuits, the foundations of nerve cell communication, nervous system plasticity, and sensory processing, especially vision. Relation of these mechanisms to causes of human neurological diseases. Prerequisite: 110a and 110b. SPRING. [3] Broadie.

258. Vertebrate Physiology. 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 salt water environments; altitude adaptation). Prerequisite: 201 or 220. SPRING. [3] Oeltmann, Carter.

262. Biomolecular Interactions. Energetics and kinetics of interactions between proteins and nucleic acids and their ligands. Topics include cooperativity, allostery, rates of binding reactions. Students will gain direct experience in computer use, but no programming is

required. Prerequisite: 220 and Physics 117a–117b. One lecture and two calculation sessions per week. [3] (Not currently offered)

265. Biochemistry II. Mechanistic biochemistry of the expression, transmission, and maintenance of genetic information. Replication, transcription, translation, recombination, and DNA repair. Prerequisite: 220. SPRING. [3] Eichman, Krezel.

266. Advanced Molecular Genetics. 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: 210. SPRING. [3] Friedman.

268. Molecular Membrane Biology. Biological membrane synthesis and its relationship to human disease. Regulation of cholesterol and phospholipid metabolism; integration of proteins into membranes; and trafficking of proteins and lipids. Prerequisite: 201. FALL. [2] Graham.

270. Statistical Methods in Biology. 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: 110a–110b. FALL. [3] McCauley.

273. Molecular Mechanisms of Environmental Toxins. Molecular interactions of environmental toxins with specific subcellular components and biochemical basis of their toxicity. Environmental mutagens, heavy metals, synthetic estrogens and other analogs of natural substrates, oxidants, and the question of synergy. Prerequisite: 210. FALL. [3] LeStourgeon.

274. Proteins. 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: 220. FALL. [3] Eichman.

279. Chemistry of the Brain. Special biochemical reactions in brain, with emphasis on human brain. Synthesis and breakdown of brain molecules and their functions in membranes, synaptic transmission, and sensory transduction. Normal brain metabolism and the changes in neurological disease. Prerequisite: BSCI 220. [3] (Not currently offered)

290. Special Topics in Biological Sciences. Topics offered vary and are cited in the *Schedule of Courses*. May be taken for credit more than once by permission of the director of undergraduate studies. Prerequisite: 110a–110b. SPRING. [3] Staff.

320. Graduate Seminar in Biological Sciences. May be taken for credit more than once. FALL, SPRING. [1] Staff.

324. Biology of Insects. An introductory survey of insects, with emphasis on diversity, taxonomy, and ecology. Two lectures and two laboratory periods per week before spring break; seven days intensive field work at Archbold Biological Station, Florida, during spring break; then individual study and final report preparation. [4] (Not currently offered)

325. Dynamic Organization of Nuclear Function. Functional interrelationships between chromatin, transcription, replication. Molecular basis for the compartmentalization of gene expression and how nuclear structures and substructures contribute to overall nuclear function. Prerequisite: IGP 300a. [3] (Not currently offered)

328. Microbial Genetics. (Also listed as Microbiology and Immunology 328) The genetics of bacteria and yeast and their use in molecular biology as an experimental tool. Prerequisite: IGP 300a. [2] (Not currently offered)

332. Seminar in Biological Rhythms. FALL, SPRING. [Variable credit: 1–2] Page, Johnson.

336. Seminar in Ecology and Evolutionary Biology. FALL, SPRING. [Variable credit 1–2]

340. Developmental Biology. Genetic, molecular, and cellular mechanisms underlying development of eukaryotic organisms with emphasis on insects and vertebrate animals. Topics include regulation of gene expression during developmental processes, specification of embryonic polarity, generation and patterning of germ layers, organogenesis, axonal specificity, evolution of chordate body plan. Prerequisite: 201 and 210. FALL. [3] Solnica-Krezel, Zwiebel.

341. Focal Topics in Molecular Biology. In-depth analysis of three to four research areas in molecular and cell biology taught by experts in each subdiscipline through lectures and discussions of papers from the current literature. Prerequisite: IGP 300a or permission of instructor. FALL. [3] Staff.

342. Advanced Developmental Biology: Vertebrate Organogenesis. (Also listed as Cell and Developmental Biology 342) Cellular and molecular regulation of the morphogenetic processes that shape vertebrate tissues and organs. Emphasis on development of digestive, respiratory, hematopoietic, cardiovascular, urogenital, sensory and nervous systems. Where appropriate, correlation to invertebrate development and reference to evolutionary changes in organ structure and function. Prerequisite: 240/340 or equivalent. SPRING. [3] Appel, Bader.

357. Plant-Animal Interactions. Ecology and evolution of species interactions at individual, population, and community levels; coevolution; pollination biology; fruit and seed dispersal; mammal and insect herbivore and plant defense mechanisms; ant-plant and animal-fungus interactions. Prerequisite: 205. [3] (Not currently offered)

363. Macromolecular Structure Determination by X-Ray Diffraction. Principles of structure determination of biological macromolecules and assemblies by X-ray diffraction. Prerequisite: one semester of biochemistry and two semesters of calculus. [2] (Not currently offered)

364. Macromolecular Structure Determination by High Field NMR. Principles of structure determination of biological macromolecules by high field nuclear magnetic resonance spectroscopy. Prerequisite: one semester of biochemistry and two semesters of calculus. [2] (Not currently offered)

369. Master's Thesis Research. McMahon and Staff.

385. Advanced Reading in Biological Sciences. Specialized topics under the guidance of a member of the department's faculty. Open to qualified graduate students only. Admission to course by arrangement. FALL, SPRING. [1–3] Staff.

390. Special Topics and Advanced Techniques in Biological Sciences. Specialized laboratory experiments, open to a limited number of properly qualified students. Admission to course, hours, and credit by arrangement. FALL, SPRING. [2–4] McMahon and Staff.

399. Ph.D. Dissertation Research. McMahon and Staff.

Biomedical Engineering

CHAIR Thomas R. Harris
DIRECTOR OF GRADUATE STUDIES Robert J. Roselli
PROFESSORS Robert Lee Galloway Jr., Todd D. Giorgio, John Gore, Thomas R. Harris, Frederick R. Haselton, Knowles A. Overholser, Robert J. Roselli, Richard G. Shiavi
ASSOCIATE PROFESSORS Adam Anderson, E. Duco Jansen, Paul H. King, Anita Mahadevan-Jansen, Cynthia B. Paschal, David R. Pickens III
ASSISTANT PROFESSORS Franz Baudenbacher, Mark Does, Michael Miga, Prasad Shastri

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

BIOMEDICAL engineering as a research discipline is concerned with the development of new physical and mathematical concepts applicable to problems of biology, medicine, and the organization of health care. Biomedical engineering also deals with more pragmatic problems, such as biomedical use of information systems and development of advanced biomedical instrumentation. The goal of the program is to provide advanced education and research training in quantitative biology, biomaterials, cellular bioengineering, physiological optics, medical imaging, biomedical instr umentation, and the scientific principles underlying the origination of therapeutic devices and processes. The program is specifically concerned with the interface between biology and the engineering, physical, computing, and mathematical sciences.

Candidates for the master of science must complete 24 hours of graduate-level courses, approved by the faculty, with the following minimum distribution: three courses in biomedical engineering, physiology (MPB 331) and one other life science course, and two courses in advanced science or engineering. All courses should carry a minimum of 3 semester hours of credit. At least two of the BME courses and one of the advanced science or engineering courses must be 300-level courses. One hour of BME seminar can count toward the total of 24 hours necessary for the M.S. degr ee. In addition, the candidate must submit a research thesis and give a final oral presentation.

The master of engineering degree, an advanced professional degree, is offered by the School of Engineering. This is a non-thesis degr ee, which includes 30 hours of course work and a design project.

Candidates for the Ph.D. degr ee must complete 36 semester hours of graduate-level didactic courses appr oved by the pr ogram faculty, excluding seminar, research, and teaching hours, and distributed as follows: 18 hours in biomedical engineering (15 hours should be 300 level), 7–8 hours of advanced life sciences (r equired: physiology (MPB 331), r ecommended: biochemistry, molecular biology, or cellular biology), and 1 1–12 hours of advanced engineering or science (at least 3 hours should be 300 level). The remainder of the 72 hours required for a Ph.D. will primarily consist of dissertation research, but may also include seminar and other appr oved

courses. In addition, students must successfully complete a comprehensive written examination covering basic knowledge in biomedical engineering, pass a qualifying examination consisting of written and oral presentations of a proposal for doctoral research, present a dissertation showing the results of original research in biomedical engineering, and successfully defend the dissertation results in an oral examination.

251–252. Systems Physiology. An introduction to quantitative physiology from the engineering point of view. Descriptive physiology of several organ systems (in particular: heart, lung, kidney, nerve, blood). Mathematical modeling and computer simulation of organ systems and physiologic control mechanisms. Prerequisite: differential equations or permission of instructor. [3–3] Staff.

258. Foundations of Medical Imaging. 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 116b, 118b, MATH 196. No credit given for both BME 258 and PHYS 228. SPRING. [3]

263. Signal Measurement and Analysis. (Also listed as Electrical Engineering and Computer Science 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 correlation analysis, and signal modeling. Implementation of these techniques on a computer is required. Prerequisite: Probability and Statistics. FALL. [3] Shiavi.

271. Biomedical Instrumentation. Methods used 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. Instrument use and data analysis. Two lectures and one laboratory. FALL. [4] Galloway.

272–273. Design of Biomedical Engineering Devices and Systems I and II. 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. A full-semester design project is required. Evaluation is conducted through periodic oral and written presentations, a final written and poster report. Corequisite for BME 272: BME 271; prerequisite for BME 272–273: BME 251, BME 252; prerequisite for BME 273: BME 271. [2–3]

274. Principles and Applications of BioMicroElectroMechanical Systems (BioMEMS). Principles, design, fabrication and application of micro- and nano-devices to instrument and control biological molecules, living cells, and small organisms. Development of microfabricated systems, lab-on-a-chip, and micro- and nano-biosensors. Topical discussions from the research literature. FALL. [3] Baudenbacher.

275. Therapeutic Bioengineering. 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: EE 213, BME 101, and BME 210. Corequisite: BME 271. SPRING. [3] Galloway.

276. Biological Basis of Imaging. 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: 258 or equivalent. SPRING. [3] Does.

281. Biotechnology. Integration of process bioengineering with cellular and molecular biology to describe the manufacture of products derived from mammalian cells. Optimization of oxygen transport and fluid shear stress in bioreactor design for mammalian cells. Biotechnology ethics. Prerequisite: one year of basic biology (BSci 100 and BSci 201 or BSci 110a and BSci 110b or equivalent) and transport phenomena (BME 210 or ChE 230 or equivalent). SPRING. [3] Giorgio.

282. Biotechnology Laboratory. Laboratory experiments in the culture of mammalian cells in bioreactors. Measurement of cell growth and transgene protein expression as a function of bioreactor conditions. Optimization of oxygen transport and fluid shear stress in bioreactor design for mammalian cells. Corequisite: 281. SPRING. [1] Giorgio.

289. Computational Modeling and Analysis in Biomedical Engineering. Survey of current topics within biomedical modeling to include topics such as transport, biomechanics, tumor and virus growth dynamics, model-based medical imaging techniques, etc. Focus will be on the mathematical development and analysis of biomedical simulations using numerical techniques for the solution of ordinary and partial differential equations. Techniques in numerical analysis will be developed to address some of the most current topics in biomedical modeling today. SPRING. [3] Miga.

312. Advanced Biomedical Instrumentation. The scientific bases and design strategies for advanced medical instrument systems. Measurements and diagnosis systems for biomechanical, biochemical, cardiovascular, radiographic, and bioelectric phenomena are discussed. Prerequisite: 271 or consent of instructor. FALL. [3] King.

313. Advanced Biomechanics. 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; nomal 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: 210 or equivalent. SPRING. [3] Roselli.

314. Bioelectric Signal Processing. The analysis of signals generated by excitable tissues: electrocardiograms, electromyograms, electroencephalograms and others. Course integrates physiological knowledge with an emphasis on mechanisms of signal generation, information in waveforms useful for physiologic investigation and medical diagnosis, and processing methodologies for automatically determining this information. Prerequisite: 263 or permission. SPRING. [3] Shiavi.

315. Dynamics of Physiological Systems. Overview of linear representations of cardiovascular systems and introduction to rudimentary aspects of physiologic control. Topics relating to physiological systems identification. Format will be didactic in part, supplemented by seminar presentations, literature review, and computational problems. Prerequisite: knowledge of Laplace and Fourier Transform methods is required; 252 or equivalent is desired. SPRING. [3] (Not currently offered)

316. Medical Imaging. A survey of medical imaging modalities and applications. Emphasis will be placed on image formation and image analysis. Prerequisite: Physics 117b, General Physics; Math 230; EECE 213; or equivalents. FALL. [3] Galloway.

317. Physiological Transport Phenomena. (Also listed as Chemical Engineering 317) The quantitative description of momentum transport (viscous flow) and mass transport (convection and diffusion) in living systems. Prerequisite: courses in fluid dynamics and mass transfer. FALL. [3] Roselli.

318. Principles and Applications of Magnetic Resonance Imaging (MRI). Physics and engineering of magnetic resonance imaging with an introduction to biomedical applications of MRI. Topics include signal generation, spatial localization, pulse sequence design, Fourier transform reconstructions, image processing, instrumentation, artifacts, MR angiography, cardiac MR, and echo planar imaging. Prerequisite: Physics 117a–117b and Math 229 or equivalents; Math 230 or equivalent recommended. FALL. [3] Paschal.

319. Engineering Models of Cellular Phenomena. 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] Haselton.

320. Laser-Tissue Interaction and Therapeutic Use of Lasers. 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] Jansen.

321. Optical Diagnosis: Principles and Applications. 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] Mahadevan-Jansen.

325. Physical Measurements on Biological Systems. (Also listed as Physics 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. One lecture and one recitation. Prerequisite: modern physics course or consent of instructor. SPRING. [3] Wikswo.

329. Advanced Computational Modeling and Analysis in Biomedical Engineering. Current topics in biomedical modeling. Biotransport, biomechanics, cell growth dynamics, and model-based medical imaging. Development of advanced model-based methods for analysis of biomedical systems. SPRING. [3]

350. Artificial Neural Networks. (Also listed as Computer Science 350 and Electrical Engineering 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] Noelle.

365. Biomedical Pattern Recognition. (Also listed as Electrical Engineering 365) General problems of pattern recognition with applications to biomedical signals and images. Topics such as feature extraction, cluster analysis, discriminant analysis, statistical decision functions, and machine learning will be introduced. Prerequisite: 263 or equivalent. FALL. [3] Shiavi.

369. Master's Research. [0]

373. Design of Medical Products, Processes, and Services. 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: 272. SPRING. [3]

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

391–392–393–394. Seminar. Biomedical engineering research seminar. [1–1–1–1]

395. Special Topics. FALL, SPRING. [Variable credit: 1–3]

399. Ph.D. Dissertation Research.

Biomedical Informatics

CHAIR Daniel R. Masys
DIRECTOR OF GRADUATE STUDIES Cynthia S. Gadd
PROFESSORS Mark E. Frisse, Nunzia B. Giuse, Douglas P. Hardin (Primary: Mathematics), Nancy M. Lorenzi, Daniel R. Masys, Randolph A. Miller, William W. Stead, Elizabeth Weiner (Primary: Nursing), Matthew B. Weinger (Primary: Anesthesiology)
ASSOCIATE PROFESSORS Steven H. Brown, Cynthia S. Gadd, Dario A. Giuse, Paul Harris, Kevin B. Johnson, Edward K. Shultz, Jay R. Snoddy
ASSISTANT PROFESSORS Constantin F. Aliferis, Dominik Aronsky, Eric Boczko, William Gregg, Shawn Levy, Josh Peterson (Primary: Medicine), S. Trent Rosenbloom, Anderson Spickard III (Primary: Medicine), Jack Starmer, David L. Tabb, Russell Waitman, Stuart T. Weinberg, Bing Zhang
ADJUNCT ASSISTANT PROFESSOR Ioannis Tsamardinos
INSTRUCTOR Fern Fitzhenry

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

BIOMEDICAL informatics studies the structure, discovery, acquisition, integration, management, and optimal use of biomedical information. The field involves multidisciplinary research in all aspects of health care delivery, biomedical research, computational biology, and public health. Biomedical informatics applies, evaluates, and expands results from a variety of disciplines including information and computer science, library science, cognitive science, business management and organization, statistics and biometrics, mathematics, artificial intelligence, operations research, economics, and of course, basic and clinical health sciences. Biomedical informatics has both "knowledge and methods" and "application domain" components. It expands beyond biomedical computer systems design, application, and evaluation to provide theory, tools, and systems that address today's most urgent challenges in health care delivery, biomedical research, and health professions education.

The curriculum offers concentration areas: Clinical Informatics, the application of informatics to direct patient care, such as advanced decision support and multimedia health records; and Bioinformatics, the application of informatics to support basic research in such areas as genomics, proteomics, and systems biology. Concentrations in development include:

Organizational Informatics, the application of informatics to the role of information technology in organizational change; and Clinical Research and Translational Informatics, applications of informatics to facilitating "bench to bedside" translational research.

Students typically enter with a background in one of the health professions (e.g., M.D., R.N., D.D.S., Ph.D. in a health-related area such as psychology or biostatistics), or with a background in computing, engineering, biology, or mathematics. After graduation they pursue careers as full-time academic researchers, part-time academic researchers/part-time clinicians, scientific managers or advanced scientists in industry, information managers in health care settings, consultants or entrepreneurs.

All students take the five core Biomedical Informatics courses: Foundations of Biomedical Informatics, Foundations of Bioinformatics and Computational Biology, Biomedical Artificial Intelligence, Clinical Information Systems and Databases, and Healthcare Organization and Management. In addition, Ph.D. students take the associated laboratory courses. Students also take (or must have taken the equivalent prior to entrance in the program) three courses in each of three competency areas: computer science, biomedicine, and research methods. Three additional electives are required for the Ph.D. degree. The curriculum is adapted to students' backgrounds and concentration area. Thus 27–40 formal course credit hours and a thesis are required for the M.S. degree, and a minimum of 72 credits is required for the Ph.D. degree. In addition to earning the M.S. degree, Ph.D. students must complete a teaching practicum, pass a qualifying examination, and successfully propose and defend a dissertation.

M.D.-M.S., M.D.-Ph.D., and part-time (50 percent) M.S. options are also available for qualified students.

300. Foundations of Biomedical Informatics. Examines the unique characteristics of clinical and life science data and methods for representing and transforming health data, information, and knowledge to improve health care. Principles of information security and confidentiality, along with functional components of information systems in clinical settings and the use of databases for outcome management. Introduction to clinical cognitive biases, formal Medical Decision Making methods, and methods for Evidence-Based Practice. Historical evaluation of the field of biomedical informatics, using examples of landmark systems developed by pioneers in the field. FALL. [3] Johnson, Masys.

300a. Foundations of Biomedical Informatics Laboratory. Applications and in-depth study of topics introduced in Foundations of Biomedical Informatics. Opportunity for a first independent study project involving a "live" deployed system in use at Vanderbilt University Medical Center. FALL. [1] Masys, Johnson.

310. Foundations of Bioinformatics and Computational Biology. Historical, conceptual, and technical foundations of bioinformatics and computational biology. Algorithms for the analysis of genome, transcript, and protein sequences. Analysis of RNA transcript abundance and proteomics. Access and manipulations of basic research data in molecular biology, including programmatic access by BioPerl and related approaches. Both results and foundational theories associated with genomics, systems biology, and emergence of biological complexity, including the molecular evolution of genes, genomes, and systems. Comparative bioinformatics that enables comparison of data across humans and model organisms. Technologies needed for a

collaborative bioinformatics that can support collaborations in basic biomedical research. This course is tightly integrated with the lab. SPRING. [3] Snoddy.

310a. Foundations of Bioinformatics and Computational Biology Laboratory. In-depth study and technical implementations of the technology and algorithms introduced in Foundations of Bioinformatics and Computational Biology. Includes hands-on use of common bioinformatics analysis tools and methods. SPRING. [1] Snoddy.

320. Healthcare Organization and Management. The purpose of this course is for students to understand the organizational world in which they will spend most of their professional lives. A better understanding will lead to strategies to build partnerships with physicians, researchers, hospitals, and academic organizations. In turn, better understanding will lead to working more closely as a team in planning future directions and implementing technological programs and changes. This course provides an overview of theoretical concepts as well as the practical tools for the student to understand and work effectively with three main topic areas: (1) understanding health care organizations, especially academic health centers, (2) understanding the health care environment, and (3) understanding organizational informatics, including leadership and people issues. FALL. [3] Lorenzi.

320a. Healthcare Organization and Management Laboratory. Applications and in-depth study of topics introduced in Healthcare Organization and Management. Case studies, simulations, and practical experience in managing informatics changes in complex organizations. FALL. [1] Lorenzi.

330. Biomedical Artificial Intelligence. *Part 1: Decision-Support Systems.* Fundamentals of AI programming (with LISP). Search algorithms. Overview of Propositional and First Order Logic (FOL). Reasoning in FOL (Generalized Modus Ponens, Forward and Backward Chaining, Resolution). Fundamental results from Theory of Computation as they apply to the study of formal reasoning systems. Semantic Networks and Description logics in biomedical informatics (UMLS, semantic web, pharmacological knowledge bases, etc.). Certainty Factor Calculus. Early Bayesian and ad-hoc systems for medical diagnosis and decision making. The Internist I/QMR/PC POETS knowledge base, and foundational algorithms. Medical knowledge/data acquisition and maintenance for Decision Support. Bayesian Networks (properties, semantics, expressive power, simulation, stochastic inference, applications). *Part 2: Machine Learning.* Introduction to ML programming techniques with MATLAB. Data cleaning and preparation (confidentiality and ownership, data formats, missing values, data transformations, distributional assumptions, codebooks, version control). Machine Learning Inductive framework. Mathematical foundations (elements of linear algebra, probability, and optimization) for ML. Algorithm families: Decision Tree Induction, Genetic Algorithms, Neural Networks, Clustering, K-Nearest Neighbors, Support Vector Machines, Feature Selection, Causal Discovery methods with Bayesian Networks. Open to graduate students of Biomedical Informatics and related disciplines, such as Computer Science, Biomedical Engineering, or Bioinformatics. Prerequisite: prior coding experience in a standard procedural or object-oriented computer language is strongly preferred. This is an intensive core course for M.S./Ph.D. students in Biomedical Informatics. Other students should consult with the instructor before registering for the class. SPRING. [3] Aliferis.

330a. Biomedical Artificial Intelligence Laboratory. Applications, implementation, and in-depth study of algorithms and topics introduced in Biomedical Artificial Intelligence. SPRING. [2] Aliferis.

340. Clinical Information Systems and Databases. Introduction to distributed systems. Networking computing concepts: OSI stack, protocols, TCP/IP, sockets, DNS. Synchronization, concurrency, deadlock, etc. Clinical databases: concepts. Full-text databases. Distributed database services. Architectural considerations in the design of clinical information systems. Case study: the VUMC clinical database architecture. High-availability techniques

for distributed services. Prerequisite: coding ability in some standard procedural or object-oriented computer language. FALL. [3] Giuse.

350. Advanced Biomedical Informatics. Review and discussion of landmark projects (dissertations, books, publications) in the field of biomedical informatics. Advanced background in biomedical informatics required (i.e., completion of the five core courses of graduate program and prior approval by instructor). FALL, SPRING (Alternate years). [3] Miller.

360. Graduate Seminar on Biomedical Informatics Algorithms. Graduate-level topics in intermediate or advanced algorithms, data structures, and knowledge representations for biomedical informatics that are not covered in the M.S./Ph.D. core courses. Note: covered topics will be highly dependent on faculty and student interests and will change from year to year to reflect research advances and interests. Students must obtain instructor permission to enter the class. SUMMER. [1–3] Aliferis.

369. Master's Thesis Research.

395. Directed Research/Independent Study. Students will work under close supervision of a specific faculty member on an ongoing research problem. Depending on the specific project, students will learn aspects of study design, research methods, data collection and analysis, research manuscript writing, and human factors engineering. SPRING, FALL. [1–3] Staff.

399. Ph.D. Dissertation Research.

Biomedical Sciences

☙ TEN programs participate in this interdisciplinary program: biochemistry, biological sciences, cancer biology, cell and developmental biology, cellular and molecular pathology, microbiology and immunology, molecular physiology and biophysics, neuroscience, pharmacology, and human genetics. During their first year, students take a core curriculum and conduct research in four laboratories before selecting the discipline in which they will earn the Ph.D. degree. Additional course work during subsequent years is appropriate to each discipline and the student's interests.

Ph.D. dissertation research may be conducted in any one of some 200 preceptors' laboratories. Research opportunities are available in the following areas: biotechnology; cancer biology; developmental biology; genetics; growth factors, oncogenes, and antioncogenes; immunology; molecular biology and gene regulation; molecular pathology; molecular toxicology; neurobiology; nutritional biochemistry; reproductive biology; signal transduction; structural biology and molecular biophysics; vascular biology; and viruses and nucleic acids.

300a. Bioregulation I. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. This includes macromolecular structure and function, cell biology, and the regulation of cell growth. FALL. [6] Patton and Staff.

300b. Bioregulation II. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Includes

immunologic defense, endocrine signalling, neuroscience, and molecular aspects of disease. SPRING. [Variable credit: 1–6] Patton and Staff.

302. Techniques and Preparations. Eight-week modules conducting laboratory research on a project designed by a faculty preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review. FALL, SPRING. [Variable credit: 1–5] Patton and Staff.

303. Responsible Conduct in Research. Formal lectures and small group discussion on a range of issues encountered in research activities. Included are responsibilities of the investigator and the university to the federal government; scientific misconduct; ethical use of animals in research; ethics of publication, lab management, and grant writing. [0] Patton and Staff.

360. Lab Research.

399. Ph.D. Dissertation Research.

Biophysics

See Molecular Physiology and Biophysics, Physics and Astronomy

Cancer Biology

CHAIR Lynn M. Matrisian
DIRECTOR OF GRADUATE STUDIES Jin Chen
PROFESSORS Lynn Matrisian, Harold L. Moses, Cathleen C. Pettepher, Vito Quaranta, Albert B. Reynolds, Ann Richmond
RESEARCH PROFESSOR Oliver McIntyre
ASSOCIATE PROFESSORS Jin Chen, Peng Liang
ASSISTANT PROFESSORS Josiane Eid, Alissa Weaver, Fiona Yull
RESEARCH ASSISTANT PROFESSORS Joseph Amann, Barbara Fingleton, Lisa McCawley, Shimian Qu, Robbert Slebos

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

STUDENTS interested in this program participate in the Interdisciplinary Graduate Program in the Biomedical Sciences during their first year (see Biomedical Sciences). The second year of study comprises a required course in Cancer Biology (342) and electives for a total of at least 24 hours of formal course work toward the Ph.D. degree (including 16 hours in the first year). Additional activities include a weekly Cancer Biology "Science Hour," an annual Vanderbilt-Ingram Cancer Center Retreat, an annual Cancer Biology departmental retreat, and teaching exercises. Most Cancer Biology students participate in the Cancer Biology Student Association (CBSA), which organizes a variety of events each year to enhance the quality of student experience in the Cancer Biology program. A thesis-based master's degree is awarded only under special circumstances.

The program offers focused and comprehensive training in the discipline of cancer biology. Modern cancer research is based on a broad range of technical skills, including molecular biology, cell biology, genetics, biochemistry, and bioinformatics, which the student will learn through course work and laboratory training. Further training includes exercises designed to develop independent thinking, skills in oral and written presentation, analysis of data and information, and dissemination of information through teaching. Thus, the program prepares students with the necessary theoretical and practical skills to succeed in an increasingly wide range of available careers, including academic research, undergraduate teaching, science writing, and basic or applied science in the biotechnology and pharmaceutical industry.

Major research efforts include studies on tumor -stroma interactions, angiogenesis, growth factor and cytokine signaling, oncogenes, tumor suppressors, matrix and matrix degredation, cell adhesion, and metastasis. These studies use state-of-the-art technologies, including all aspects of molecular and cell biology, biochemistry, transgenics, differential display, microarray, and others.

Faculty of the department also participate in inter disciplinary training programs in cancer research supported by the National Cancer Institute of the National Institutes of Health.

320. Cancer and Development. A cross-listed CDB/CB graduate-level course that will examine relationships between cellular responses in normal tissue development and cancer. The goal of the course is to familiarize the students with major cellular pathways and responses that are regulated in normal embryonic and post-natal tissue development and how abnormal re-activation of these responses gives rise to malignant disease. SPRING. [3] deCaestecker.

322. Cell and Tissue Biology. This course is taught as part of the medical curriculum (548–5010), but is also available to graduate students. It is designed to give students a familiarity with the properties of cells, in particular their interactions with one another as components of the tissues and organs of the body. Emphasis is placed on the correlates between structure and function at both the light and electron microscopic levels as a basis for understanding the physiological and biochemical activities of cells and tissues. No prerequisite. SPRING. [4]. Pettepher, Jerome.

342. Cancer Biology. Advanced concepts in Cancer Biology will be reviewed using a combination of lectures, and discussion sessions based on current literature. Topics range from the molecular biology of cancer (oncogenes and tumor suppressors) to issues of drug design and clinical trials. Prerequisite: IGP core course or consent of instructor. FALL. [4] Matrisian, Yull.

344. Current Topics in Cancer Biology. A literature-based course covering cancer metastasis. This course focuses on the biology and treatment of malignant disease. Topics vary from year to year. Prerequisite: first-year IGP cancer biology module or permission from instructor. SPRING. [2] Kasper.

325. Histology. (Also listed as Cell and Developmental Biology 325 and Cellular and Molecular Pathology 325) This course focuses on the organization of cells to form tissues and organs both in terms of structure and function. Our studies begin with a discussion of the basic tissue types that form all multicellular organisms. Lecture and microscopic laboratory formats will introduce students to epithelia, connective tissue, muscle, nerve, and lymphoid tissues. Students will examine histological preparations microscopically in laboratory during this phase of

the course. Next, a discussion of the organization of tissues into functioning organs will be pursued. Here, we will focus on basic concepts in organ arrangement rather than memorizing various structures. Students will have significant input on which adult or developing organs are used as models of organ structure and function. Learning laboratory methods in the analysis of tissues and organs will run concurrently with didactic instruction. Students will be asked to choose specific tissues/organs (often directly related to their thesis work) that they will prepare for morphological analysis. Specifically, students will learn methods in fixation, processing, sectioning, and microscopic analysis including morphometrics, immunofluorescence, histochemistry, and electron microscopy. FALL. [3] Bader.

369. Master's Thesis Research.

399. Ph.D. Dissertation Research. [0–12]

Cell and Developmental Biology

CHAIR Susan R. Wente
DIRECTOR OF GRADUATE STUDIES Kathleen L. Gould
PROFESSORS Vivien A. Casagrande, Arthur F. Dalley II, Kathleen L. Gould, Steven Hanks, Stephen R. Hann, David M. Miller III, Jeanette Norden, Gary E. Olson, Susan R. Wente, Christopher V. E. Wright
ASSOCIATE PROFESSOR EMERITUS James McKanna
ASSOCIATE PROFESSORS Chin Chiang, Christopher F. Hardy
ASSISTANT PROFESSORS Byeong J. Cha, Daniela Drummond-Barbosa, Guoqiang Gu, Stacey Huppert, Irina N. Kaverina, Ethan Lee, Laura Lee, Matthew J. Tyska

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

GRADUATE study in Cell and Developmental Biology at Vanderbilt emphasizes an interdisciplinary approach to biological research. The department supports strong research programs in the areas of cell proliferation, neurobiology, developmental biology, and reproductive biology; graduate studies in each of these areas may include interdepartmental courses from Cell and Developmental Biology, Biochemistry, Pharmacology, Psychology, Biological Sciences, and Molecular Physiology and Biophysics. Tutorials, seminars, and laboratory rotations foster intellectual interaction between students and faculty. Students are encouraged to begin their research while completing didactic course requirements. During the first year, the student's effort is divided equally between research and course work. Current research projects focus primarily at the cellular and sub-cellular levels, utilizing biochemical, molecular biological, genetic, cell culture, physiological, and ultrastructural techniques in efforts to correlate structure and function.

310. Cell Biology. A graduate-level course that examines current topics in cell biology, emphasizing relationships between structure and function at the cellular, subcellular, and molecular level. Reviews literature relating to weekly topic(s), which include the cell cycle, signal transduction, transcriptional and post-transcriptional regulation of gene expression, control of cell proliferation, differentiation and development. Develops critical skills, including data interpretation and testing a hypothesis. Prerequisite: IGP curriculum. FALL. [4] Chiang, Gu.

320. Cancer and Development. A cross-listed CDB/CB graduate-level course that will examine relationships between cellular responses in normal tissue development and cancer. The goal of the course is to familiarize the students with major cellular pathways and responses that are regulated in normal embryonic and post-natal tissue development and how abnormal re-activation of these responses gives rise to malignant disease. SPRING. [3] deCaestecker.

321. Gross Anatomy. Devoted to a regional dissection of the human body supplemented by lectures and demonstrations. The emphasis is on the functional and clinical relevance of the anatomical structures. Class meeting dates determined by the calendar of the School of Medicine. Admission requires consent of the instructor. FALL. [7] Dalley.

323. The Nervous System. (Also listed as Neuroscience 323) Emphasis on providing second-year medical students and graduate students with a solid understanding of the organization of the human central nervous system, integrating basic information from neuroanatomy, neurophysiology, and neurochemistry. Covers the most up-to-date research conducted in neurobiology, with emphasis on research with potential clinical significance. Clinical material is provided by patient presentations, discussions of the impact of neurological disease on patients and their loved ones, and by an analysis of pathological cases. Four hours lecture and four hours laboratory per week. Microscope rental fee is required. Audits allowed only under special circumstances. FALL. [3–4] Norden.

324. Epithelial Pathobiology. Introduces students to issues of polarized epithelial cell function in the context of alterations of pathophysiology. One two-hour session per week, one semester course. Two-hour session will consist of a thirty-minute introductory lecture followed by 1.5 hours of paper presentation and discussion. During the course, we also propose to bring in two visiting lecturers to cover specific topics, changing each year. Prerequisite: IGP courses or equivalent preparation. SPRING. [2] Goldenring.

325. Histology. (Also listed as Cancer Biology 325 and Cellular and Molecular Pathology 325) This course focuses on the organization of cells to form tissues and organs both in terms of structure and function. Our studies begin with a discussion of the basic tissue types that form all multicellular organisms. Lecture and microscopic laboratory formats will introduce students to epithelia, connective tissue, muscle, nerve, and lymphoid tissues. Students will examine histological preparations microscopically in laboratory during this phase of the course. Next, a discussion of the organization of tissues into functioning organs will be pursued. Here, we will focus on basic concepts in organ arrangement rather than memorizing various structures. Students will have significant input on which adult or developing organs are used as models of organ structure and function. Learning laboratory methods in the analysis of tissues and organs will run concurrently with didactic instruction. Students will be asked to choose specific tissues/organs (often directly related to their thesis work) that they will prepare for morphological analysis. Specifically, students will learn methods in fixation, processing, sectioning, and microscopic analysis including morphometrics, immunofluorescence, histochemistry, and electron microscopy. FALL. [3] Bader.

330. Seminar in Cell and Developmental Biology. The goal of the course is for graduate students to learn about two cutting-edge areas of research in cell and developmental biology. In 2006 the topic areas were Ubiquitin and Ubiquitin-like modification in CDB and Neuro Development. Each area will be presented by four outside speakers (eight dates total). The week before each seminar the students will read and discuss, facilitated by a faculty member, a paper authored by the next week's speaker and prepare written critiques. The students will attend the seminar followed by a discussion section with the speaker. FALL, SPRING. [1] Hardy and Staff.

331. Current Topics in Developmental Biology. This course is offered in both the fall and spring semesters and meets once per week to hear a graduate student, postdoctoral fellow or faculty member discuss a research paper from outside his or her field of research, followed by an audience Q&A session. Students taking this course are paired with a PI mentor and together choose a topical scientific paper that the trainee presents at the end of the semester. FALL, SPRING. [1] Wright.

333. Reproductive Biology. A multidisciplinary approach to the study of reproductive biology. Topics covered center on cutting-edge research advances in modern reproductive biology, including: specification of germ cells; cell signaling and the germ line; gonadogenesis and sex determination; meiosis; X-inactivation; germline stem cells; spermatogenesis; oogenesis; fertilization; and implantation. The format will consist of a combination of lectures, faculty-led discussions, and faculty-mentored student presentations. SPRING. [2] Staff.

334. Topics in Growth Regulation. Discussion of current literature in mechanisms of cellular regulation. Emphasis on developing a critical approach to experimental design and interpretation of data. Admission by consent of instructor. [2] (Not currently offered)

335. Special Topics in Neuroscience. (Also listed as Neuroscience 335 and Psychology 335) Basic issues in neuroscience. Possible topics include neural development, neural plasticity, regeneration, organization and function of cortex, sensory systems, motor systems, and research methodology in neuroscience. A new topic is considered each semester. Prerequisite: 323 or equivalent course, or permission of instructor. FALL. [2] Casagrande.

336. Advanced Neuroanatomy. Designed for medical students who wish to explore in more detail topics covered in Cell and Developmental Biology 323. Emphases on advanced neuroanatomical techniques (electron microscopy, freeze-fracture, fluorescence microscopy, electrophysiology), on an understanding of original current research conducted in neuroanatomy, and on clinical correlations. Students may elect to emphasize clinical correlations and do rotations in various subfields of neurobiology (neuro-oncology, surgery, etc.). Admission by consent of instructor only. Prerequisite: 323. No audits allowed. FALL, SPRING, SUMMER. [2] Norden.

337. Molecular Aspects of Cancer Research. (Also listed as Biochemistry 337) A focused series of seminars and discussions to explore the molecular basis of cancer. Seminars rely heavily on extramural speakers with recognized expertise in selected research areas. Students meet with the speaker immediately following each seminar. Discussion sections led by a faculty member follow each series of three to four seminars. SPRING. [1] Carpenter (Biochemistry).

338. Special Topics in Cell Biology. This course is intended to give first-year IGP students a personal perspective on the careers of exceptional cell and developmental biology researchers. Each session will focus on Nobel Prize or Lasker Award winners in Physiology or Medicine that have impacted cell and developmental biology fields. A faculty member with training or interest ties to the researcher will present and lead a discussion on the research topic and the history of the researcher's career. In preparation for each session, the students will research the information at or linked to the award Web sites. For each session, the students will be given a key paper(s) of the winner (or the winner's acceptance speech, or biographical articles, etc. at the discretion of the faculty member). During the class-time interactions with the faculty member, the students will incorporate their perspectives on what they found interesting about the winner's history. For the last wrap-up session, each student will pick an award winner, who has not been discussed, and prepare a 15-minute presentation about that person. SPRING. [Maximum credit: 2] Wente.

339. Research Seminar in Cell Biology. Students and postdoctoral fellows present their research projects in an informal atmosphere. Students are critiqued on presentations. FALL, SPRING. [1] E. Lee, L. Lee.

340. Special Problems and Experimental Techniques. Designed to allow the student an opportunity to master advanced techniques in cell biology while pursuing special projects under individual members of the faculty in their areas of expertise. Admission to course, hours, and credit by arrangement. FALL, SPRING, SUMMER. [Variable credit: 1–6] L. Lee.

341. Molecular Developmental Biology. This course focuses on three cutting-edge areas of developmental biology per year. The aim of this course is to provide the student with a comprehensive and up-to-date understanding of fundamental issues in modern developmental biology. Faculty didactic lectures provide essential background to facilitate critical reading and discussions of the recent scientific literature. This course is modular, with each module (approximately one month) corresponding to a single thematic topic. Topics for 2007 to be selected. SPRING. [Variable credit: 1–3] Gannon.

342. Advanced Developmental Biology: Vertebrate Organogenesis. (Also listed as Biological Sciences 342) Cellular and molecular regulation of the morphogenetic processes that shape vertebrate tissues and organs. Emphasis on development of digestive, respiratory, hematopoietic, cardiovascular, urogenital, sensory and nervous systems. Where appropriate, correlation to invertebrate development and reference to evolutionary changes in organ structure and function. [3] (Not currently offered)

345. Cellular and Molecular Neuroscience. (Also listed as Molecular Physiology and Biophysics 345, Neuroscience 345, Pharmacology 345) Students are exposed to fundamental concepts and techniques in molecular and cellular neuroscience and provided with a theoretical context for experimental analysis of brain function. The course is divided into four modules. *Module I: Biophysics and Biochemistry of Synaptic Transmission* reviews biophysical and molecular concepts relating to membrane excitability, action potential generation and propagation, and the molecular basis of chemical signaling at synapses. *Module II: Synaptic Integration and Plasticity* discusses mechanisms and models of synaptic integration and plasticity and concentrates on how molecular changes translate into altered synaptic strength and gene expression programs that underlie short and long-term plasticity. *Module III: Neural Development* examines historical and current concepts in neural pattern formation, neural migration, axon guidance and synapse formation. *Module IV: Neural Diseases and Disease Models* focuses on specific brain disorders such as epilepsy, depression, schizophrenia, and Alzheimer's disease and current models used to investigate their origin and/or treatment. This course combines faculty lecture with discussion of original articles, with an emphasis on student participation. SPRING. [4] Blakely, Carter, and Staff.

347. The Visual System. (Also listed as Electrical Engineering 351, Neuroscience 347, Psychology 336) An introduction to the anatomy, physiology, psychophysics, and pathologies of the sense of sight. Physiological optics, retinal anatomy, physiology and neurochemistry, color vision, brain areas involved in visual processing and clinical problems associated with the visual system. SPRING. [3] Casagrande, Bonds (Electrical Engineering), Lappin (Psychology).

350. Cellular Microbiology of the Pathogen-Host Interaction. (Also listed as Microbiology & Immunology 350) An interdisciplinary course designed to train students at the interface of molecular microbiology and cell biology. Model organisms of their products will be analyzed in the context of molecular cell biology. Students will be challenged to utilize new information from microbial genome sequencing to understand host cell subcellular compartments and signaling pathways. [4] (Not currently offered)

369. Master's Thesis Research.

399. Ph.D. Dissertation Research.

Cellular and Molecular Pathology

CHAIR Samuel A. Santoro
DIRECTOR OF GRADUATE STUDIES To Be Named
PROFESSORS James B. Atkinson III, Paul E. Bock, Raymond F. Burk, Jeffrey Mark Davidson, Sergio Fazio, Agnes B. Fogo, David R. Head, Richard L. Hoover, Barbara O. Meyrick-Clarry, William M. Mitchell, Harold L. Moses, Fritz F. Parl, Samuel A. Santoro, Virginia L. Shepherd, Larry L. Swift, Mary M. Zutter
ASSOCIATE PROFESSORS Sarki A. Abdulkadir, Robert C. Briggs, David Gailani, Walter G. Jerome III, Kevin G. Osteen, Gregory C. Sephel, Yi-Wei Tang, William M. Valentine
ASSISTANT PROFESSORS James D. Chappell, Gilbert Moeckel, Claudio A. Mosse, Alissa M. Weaver, Pampee Young
RESEARCH ASSISTANT PROFESSOR Ingrid A. M. Verhamme

DEGREE OFFERED: *Doctor of Philosophy*

STUDENTS interested in this program participate in the Interdisciplinary Graduate Program in the Biomedical Sciences (see Biomedical Sciences). Cellular and Molecular Pathology occupies a unique place among the biomedical sciences in that it bridges the basic science and clinical disciplines. It seeks to determine the mechanism and etiology of disease, to study the agents and conditions that cause disease, and to elucidate the steps in the transformation of a normal tissue or process into an abnormal one. Pathology is ideally positioned to influence the conceptual and methodologic transfer of advances in the basic biological sciences to the alleviation of disease and the maintenance of health. It uses, therefore, a methodology that encompasses in part the techniques of all other basic and clinical science. Undergraduate majors in biology, chemistry, biochemistry, and molecular biology are appropriate preparation for graduate work in pathology, which requires a foundation in biochemistry, immunology, molecular genetics, and structural biology.

The program in Cellular and Molecular Pathology leading to the Ph.D. degree is designed to prepare students for careers in biomedical sciences, focusing on research. Students in their first year complete a core of course work through the Interdisciplinary Graduate Program in the Biomedical Sciences (see Biomedical Sciences). The second year of study comprises required and elective courses for a total of at least 24 hours of formal course work (including the 16 hours in the first year). Course selection is tailored to the interests and particular needs of the student, and elective hours are usually taken in areas such as cell biology, biochemistry, molecular biology, and molecular physiology and biophysics. Qualifying examinations are administered after the second year of study, and the final two to three years of the program are devoted to research. A thesis-based master's degree is awarded only under special circumstances.

The research interests of the faculty include vascular biology and biochemistry, tumor pathology, the immune response, inflammation and

repair, the biology of the extracellular matrix in response to disease processes, the pathogenesis of infectious agents, and the regulation of gene expression in disease. The department is fully equipped with modern research training facilities and provides close faculty mentoring through a high faculty-to-student ratio.

322. Experimental Methods in Pathology. Special techniques and preparations. Topics include electron microscopy, tissue culture, histochemistry, cytochemistry, and molecular biology. Admission to course, hours, and credit by arrangement. FALL, SPRING, SUMMER. [2–4] Swift and Staff.

325. Histology. (Also listed as Cancer Biology 325 and Cell and Developmental Biology 325) This course focuses on the organization of cells to form tissues and organs both in terms of structure and function. Our studies begin with a discussion of the basic tissue types that form all multicellular organisms. Lecture and microscopic laboratory formats will introduce students to epithelia, connective tissue, muscle, nerve, and lymphoid tissues. Students will examine histological preparations microscopically in laboratory during this phase of the course. Next, a discussion of the organization of tissues into functioning organs will be pursued. Here, we will focus on basic concepts in organ arrangement rather than memorizing various structures. Students will have significant input on which adult or developing organs are used as models of organ structure and function. Learning laboratory methods in the analysis of tissues and organs will run concurrently with didactic instruction. Students will be asked to choose specific tissues/organs (often directly related to their thesis work) that they will prepare for morphological analysis. Specifically, students will learn methods in fixation, processing, sectioning, and microscopic analysis including morphometrics, immunofluorescence, histochemistry, and electron microscopy. FALL. [3] Bader.

329. Lipoprotein Metabolism. Lectures, discussions, and assigned readings in the metabolism of plasma lipoproteins. Topics include the composition and structure of plasma lipoproteins; lipoprotein biosynthesis and assembly; enzyme, exchange proteins, and receptors involved in lipoprotein catabolism; and disorders of lipid metabolism. Presentation of oral reports is required. Prerequisite: an introductory course in biochemistry. Minimum enrollment six students. SPRING. [2] Fazio, Linton, Swift.

331. Seminar in Experimental Pathology. Students and faculty participate in a weekly discussion of current research projects and literature. FALL. [1] Briggs and Staff.

332. Current Topics in Experimental Pathology. Students and faculty participate in a weekly discussion of current research projects and literature. SPRING. [1] Briggs and Staff.

333. Fundamentals of Scientific Communication. Focuses on development and enhancement of skills in written and oral scientific communication, and critical thinking in scientific problem solving. Lectures, student projects, presentations, and class discussions emphasizing manuscript and research grant proposal writing, poster and oral presentations. SPRING. [3] Bock, Hoover, and Staff.

335. Molecular Pathology of Extracellular Matrix. Lectures on the structure, genes, metabolism, and regulation of the collagens, structural glycoproteins, proteoglycans, and elastin. The role of these macromolecules in maintaining normal tissue integrity and function and in development and wound healing is emphasized, as is the molecular basis for the involvement of these proteins in both inherited and acquired diseases (e.g., atherosclerosis, diabetes, and cancer). Prerequisite: biochemistry and/or cell biology. SPRING. [2] Davidson, Sephel, and Staff.

337. Cellular and Molecular Basis of V ascular Disease. Lectures on contemporar y research in cell biology, protein and lipid biochemistry, and molecular biology of the vascular system. Open to graduate and medical students, postdoctoral fellows, and undergraduate students with consent of instructors and the Graduate School. Pr erequisite: a suitable background in biochemistry and cell biology. FALL. [3] Bock, Hoover.

351. Cellular and Molecular Basis of Pathology . An introduction to the morphology and pathogenesis of disease, with emphasis on alterations of nor mal cellular, molecular, and biochemical processes and on r ecent developments in our understanding of disease. Lectur es, review of normal histology, small group discussions, and laboratory work. Prerequisites include a basic knowledge of biochemistry, cell, and molecular biology. SPRING. [4] Sephel and Staff.

399. Ph.D. Dissertation Research.

Chemical and Physical Biology

ELEVEN departments participate in this inter disciplinary program: biochemistry, biological sciences, cancer biology , cell and developmental biology, chemistry, microbiology and immunology, mathematics, molecular physiology and biophysics, pathology , pharmacology, and physics. During their first year , students take a cor e curriculum and conduct research in three laboratories before selecting the discipline in which they will earn the Ph.D. degr ee. Additional course work during subsequent years is appropriate to this discipline and the student's interests.

Ph.D. dissertation r esearch may be conducted in any one of over forty preceptors' laboratories or, by special r equest, in any laboratory in the eleven participating departments. Resear ch opportunities ar e available in the following ar eas: biological mass spectr oscopy, biomagnetics and nonlinear dynamics, computational biology and molecular modeling, pr otein-protein interactions, NMR and EPR, chemical biology , fluorescence spectroscopy and micr oscopy, protein-nucleic acid interactions, str uctural biology, nanocrystals, macr omolecular structure and dynamics, mechanistic enzymology, proteomics, molecular toxicology, and mathematical modeling of biological systems.

303. Responsible Conduct in Research I and II. Formal lectures and small group discussion on a range of issues encountered in research activities. Included are responsibilities of the investigator and the university to the federal gover nment; scientific misconduct; ethical use of animals in r esearch; ethics of publication, lab management, and grant writing. [0] Chalkley and Staff.

310. Graduate Seminar in Chemical Biology. FALL. [1] Marnett.

349. Graduate Seminar in Molecular Biophysics. SPRING. [1] Chazin.

399. Ph.D. Dissertation Research.

Chemical Engineering

CHAIR M. Douglas LeVan
DIRECTOR OF GRADUATE RECRUITING G. Kane Jennings
DIRECTOR OF GRADUATE PROGRAM Bridget R. Rogers
DIRECTOR OF UNDERGRADUATE PROGRAM Kenneth A. Debelak
PROFESSORS EMERITI Robert J. Bayuzick, Tomlinson Fort, Thomas M. Godbold, John A. Roth, Robert D. Tanner
PROFESSORS Peter T. Cummings, Thomas R. Harris, David S. Kosson, Paul E. Laibinis, M. Douglas LeVan, K. Arthur Overholser, Robert J. Roselli, Karl B. Schnelle Jr.
RESEARCH PROFESSOR Ales Prokop
ASSOCIATE PROFESSORS Kenneth A. Debelak, Todd D. Giorgio, G. Kane Jennings, Bridget R. Rogers
ASSOCIATE PROFESSOR OF THE PRACTICE Julie Ervin Sharp
ASSISTANT PROFESSORS R. Robert Balcarcel, Scott A. Guelcher, Clare McCabe

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

CHEMICAL engineers play key roles in the development and production of pharmaceuticals and bioengineered materials, high-strength composites and specialty polymers, semiconductors and microelectronic devices, a wide range of ultrapure fine chemicals, and in a variety of other processes. Indeed, chemical engineering is essential for the operation of contemporary society. The solution of many of the problems facing society today—e.g., energy, the environment, development of high-performance materials—will involve chemical engineers.

Graduate work in chemical engineering provides an opportunity for study and research at the cutting edge —to contribute to shaping a new model of what chemical engineering is and what chemical engineers do. Formal course work essentially doubles the exposure to chemical engineering principles that students receive as undergraduates. Thesis research gives unparalleled experience in problem solving, the key to challenging research assignments in industry and admission to the worldwide community of scholars.

All faculty members are active in research and direction of graduate student projects. Current research includes problems in six broad areas: adsorption and surface chemistry; biochemical engineering and biotechnology; chemical reaction engineering; environment; materials; process modeling and control.

Programs leading to the M.S. and Ph.D. degrees are offered through the Graduate School. Both require a combination of course work and a thesis. The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering. There is no language requirement for any degree.

Candidates for the master of science must complete 24 semester hours of graduate level courses (12 hours in chemical engineering core courses, a 3-hour technology elective from an approved list, and 9 hours in a field

complementary to the research). In addition to course work, each degree candidate conducts research under the supervision of a faculty adviser, prepares a written thesis, and presents it orally to the faculty. An M.S. program for non-chemical engineering undergraduates also exists at Vanderbilt. Persons interested in this program should contact the director of the graduate program in Chemical Engineering for more detailed information.

Candidates for the doctor of philosophy complete a minimum of 72 semester hours of work beyond the bachelor's degree. At least 30 of these hours are course work (21 hours in chemical engineering graduate courses including 15 hours in required chemical engineering courses and 6 hours in chemical engineering electives). Ph.D. students are required to take at least 6 semester hours outside the department in a related technical field or fields, excluding any courses cross-listed with the department. These courses should complement the student's research interests. The remaining hours are Ph.D. dissertation research. The course load is designed to allow students to spend the majority of their studies on original research. Up to 24 hours of graduate course work with an equivalent of *A* or *B* grade may be transferred to Vanderbilt and applied to the Ph.D. At the end of the first calendar year in residence, students complete a written comprehensive examination on fundamentals that are presented in the chemical engineering core courses. Admission to candidacy in the Ph.D. program is based upon this departmental examination, as well as the Ph.D. qualifying examination, which consists of written and oral presentation of a proposal for doctoral research. An examination in the minor field may also be given. Following the examinations and at least 24 semester hours of dissertation research, the student prepares and publicly defends a dissertation presenting results of original research in chemical engineering.

225. Kinetics. 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. A brief treatment of catalysis and physical and chemical adsorption is given. Graduate credit for nonmajors. Prerequisite: 223, Chemical and Phase Equilibria and Chemistry 231. FALL. [3]

230. Introductory Transport Phenomena. The principles of mass, momentum, and energy transport and their application to analysis and design of engineering systems. Graduate credit for nonmajors. Prerequisite: consent of instructor. Corequisite: Math 198. FALL. [3]

231. Rate-Based Transport Operations. Principles and techniques of chemical engineering practice and design. Analysis of chemical engineering processes involving mass transfer, heat transfer, and fluid mechanics. Consideration of safety in the context of process equipment design. Graduate credit for nonmajors. Prerequisite: 230 or consent of instructor. SPRING. [3]

232. Separation Processes. Chemical engineering design and practice of chemical separation processes that reach or approach equilibrium. These processes include distillation, adsorption, and extraction. Process simulation of separation processes is required. Consideration of safety and economics in the context of process and equipment design. Graduate credit for nonmajors. Prerequisite: 230 or consent of instructor. SPRING. [3]

233W. Chemical Engineering Process Design. A capstone design course for chemical engineering students. A systematic approach to design and safety practices for chemical process operations. The course involves process design, economic evaluation of alternatives, and a cost and safety analysis of a typical chemical or petroleum process. The use of process simulations is required. A comprehensive design report is required. Graduate credit for nonmajors. Prerequisite: 232 and 216 or consent of instructor. SPRING. [4]

242. Chemical Process Control. 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. Graduate credit for nonmajors. Prerequisite: Math 198. SPRING. [3]

280. Atmospheric Pollution. (Also listed as Civil Engineering 280) Fundamentals of atmospheric pollution and control. The sources and nature of gaseous and particulate air pollutants, the relation of meteorological conditions to their dispersal, and their effects on health and materials are discussed along with administration, standards, and control of air pollution. FALL. [3]

282. Biochemical Engineering. A course in enzyme catalysis, microbial growth, bioreactor design and analysis and product recovery. Emphasis will be placed on enzyme kinetics and fermentation, process modeling, applications of models to commercial fermentations, biomass plants, and enzyme engineering. For graduate students and advanced undergraduates. Prerequisite: consent of instructor. [3] (Offered on demand)

283. Biopharmaceutical Engineering. The production of biopharmaceuticals will be studied within the context of diseases and ailments that may be remedied through the engineering of novel bio-pharmaceuticals. Topics will include molecular bases of disease, drug discovery, drug delivery, cell line generation, nutritional requirements of cell cultures, metabolic engineering of cell lines, and large scale-production plant design of mammalian cell based processes. Prerequisite: junior/senior standing in engineering or biological science or graduate standing. SPRING. [3]

284. Semiconductor Materials Processing. Introduction to the materials processing unit operations of silicon device manufacturing. Topics include 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. FALL. [3]

290. Special Topics in Chemical Engineering. For beginning graduate and advanced undergraduate students. New areas and technology of interest to faculty and students in chemical engineering. Prerequisite: consent of instructor. FALL. [3]

310a. Applied Mathematics in Chemical Engineering I. Chemical engineering applications of advanced methods of mathematics, such as Laplace transforms, calculus of finite differences, and numerical methods, with emphasis on expressing physical situations in mathematical language together with methods used in analysis of experimental data. FALL. [3]

310b. Applied Mathematics in Chemical Engineering II. A continuation of 310a. [3] (Offered on demand)

311a–311b. Advanced Chemical Engineering Thermodynamics. 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; and other special advanced topics relevant to chemical engineering. 311a, FALL; 311b offered on demand. [3–3]

312a. Transport Phenomena I. The theory of nonequilibrium processes. Development of the analogy between momentum, energy, and mass transport, with applications to many common engineering problems. SPRING. [3]

312b. Transport Phenomena II. A continuation of 312a. [3] (Offered on demand)

313. Applied Chemical Kinetics. Experimental methods in kinetics. Kinetics of industrial reactions and reactor design. Adsorption and catalytic systems are considered. FALL. [3]

314. Advanced Separation Processes. Current separation operations such as distillation, absorption, extraction, reactive distillation, membrane processes, adsorption, and adsorptive bubble methods. [3] (Offered on demand)

315a–315b. Systems Analysis for Process Design and Control. The design and control of chemical process plants, including economic optimization under steady state and transient conditions. [3–3] (Offered on demand)

317. Physiological Transport Phenomena. (Also listed as Biomedical Engineering 317) The quantitative description of momentum transport (viscous flow) and mass transport (convection and diffusion) in living systems. Prerequisite: courses in fluid dynamics and mass transfer. [3] (Offered on demand)

320. Surfaces and Adsorption. Surface energy, capillarity, contact angles and wetting, surface films, insoluble monolayers, solid surfaces, membranes, surface area determination, adsorption, adhesion, interface thermodynamics, friction and lubrication, interfaces in composites, relationships of surface to bulk properties of materials. [3] (Offered on demand)

325. Polymer Science and Engineering. Macromolecular systems, with emphasis on the interrelationship of chemical, physical, and engineering properties and the further relation of these properties to synthesis and application. A basic understanding of organic chemistry and of physical chemistry is assumed. [3] (Offered on demand)

328. Chemical Engineering Simulation. Modeling and simulation of chemical engineering systems using numerical methods applied to the solutions of multiscale linear and non-linear systems of equations, and ordinary and partial differential equations. FALL. [3]

334. Advanced Reaction Kinetics. The optimum design of chemical reactors and modern topics in engineering kinetics. [3] (Offered on demand)

352. Advanced Physical/Chemical Wastewater Treatment. The theory of mass transfer and chemical reactor technology in advanced wastewater treatment design; physical/chemical processes in municipal and industrial wastewater treatment; evaluation of process alternatives for cost effectiveness. Prerequisite: CE 211, Water and Waste Water Treatment or consent of instructor. SPRING. [3]

369. Master's Thesis Research. [0]

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

397. Special Topics. FALL. [3]

398. Seminar. [0]

399. Ph.D. Dissertation Research.

Chemistry

CHAIR Ned A. Porter
DIRECTOR OF UNDERGRADUATE STUDIES Adam K. List
DIRECTOR OF GRADUATE STUDIES Charles M. Lukehart
PROFESSORS EMERITI Robert V. Dilts, Larry C. Hall, Thomas M. Harris, Melvin D. Joesten, Mark M. Jones, Lawrence J. Schaad, David L. Tuleen, David J. Wilson
PROFESSORS Richard N. Armstrong, Darryl J. Bornhop, Richard M. Caprioli, David L. Hachey, David M. Hercules, B. Andes Hess Jr., Jeffrey N. Johnston, Charles M. Lukehart, Terry P. Lybrand, Lawrence J. Marnett, Prasad L. Polavarapu, Ned A. Porter, Carmelo J. Rizzo, Michael P. Stone, Gary A. Sulikowski, Joel Tellinghuisen
RESEARCH PROFESSOR Thomas M. Harris
ADJOINT PROFESSORS James N. Lowe, Lidia Smentek
ASSOCIATE PROFESSORS H. Alex Brown, Timothy P. Hanusa, Piotr Kaszynski, Sandra J. Rosenthal, David W. Wright
RESEARCH ASSOCIATE PROFESSOR Constance M. Harris
ASSISTANT PROFESSORS Brian O. Bachmann, David E. Cliffel, Eva M. Harth, John A. McLean, Jens Meiler
RESEARCH ASSISTANT PROFESSORS Hye-Young Kim, Ivan Kozekov, Keri A. Tallman, Ian D. Tomlinson, Huiyong Yin
ADJOINT ASSISTANT PROFESSOR Andrienne C. Friedli
SENIOR LECTURERS Adam K. List, Shawn T. Phillips, Michelle M. Sulikowski, Grace R. Zoorob
LECTURER Tara D. Todd

DEGREES OFFERED: *Master of Arts in Teaching, Master of Science, Doctor of Philosophy*

RESEARCH programs are offered in the traditional areas of analytical, inorganic, organic, and physical chemistry along with interdisciplinary research programs in biological, environmental, and materials chemistry and chemical physics. A wide range of research projects are under active investigation and are supported by excellent research facilities, modern instrumentation, and external funding.

A research thesis is required for a master's degree. Specific requirements for the Ph.D. degree are defined in a Ph.D. program document that is available upon request from the Department of Chemistry. Both the master's and Ph.D. degrees require a minimum of 24 hours of formal course work.

202. Introduction to Bioinorganic Chemistry. Functions of inorganic elements in living cells. The manner in which coordination can modify the properties of metallic ions in living systems. Non-metallic elements including selenium, iodine, chlorine, and phosphorus. Prerequisite: 220a–220b. SPRING. [3] Wright.

203. Inorganic Chemistry. 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: organic and physical chemistry. FALL. [3] Lukehart.

204. Inorganic Preparations. Synthesis and characterization of inorganic compounds or materials; one laboratory per week. Pre- or corequisite: 203. SPRING. [1] Lukehart.

207. 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: 203, 220a–220b. [3] Lukehart. (Not currently offered)

210. Introduction to Analytical Chemistry. Fundamental quantitative analytical chemistry with emphasis on principles of analysis, separations, equilibria, stoichiometry and spectrophotometry. No credit for graduate students in chemistry. Must be accompanied by 212a. SPRING. [3] Bornhop.

211. Instrumental Analytical Chemistry. Chemical and physical principles of modern analytical chemistry instrumentation. Credit allowed for chemistry graduate students having deficiency. Prerequisite: 210, 220a–220b, and 230. Must be accompanied by 212b for undergraduates. FALL. [3] Cliffel.

212a–212b. Analytical Chemistry Laboratory. Laboratory to accompany Chemistry 210 (212a) and 211 (212b). No credit for graduate students in chemistry. Corequisite: 210–211. One four-hour laboratory per week. [1–1] Zoorob.

219a–219b. Organic Chemistry Laboratory. Laboratory to accompany 220a–220b. Corequisite: 220a–220b. One four-hour laboratory per week. [1–1] List.

220a–220b. Organic Chemistry. Fundamental types of organic compounds, their nomenclature, classification, preparations, reactions and general application. Prerequisite: 102a–102b, 103a–103b, 104a–104b. No credit for graduate students in chemistry. Ordinarily accompanied by 219a–219b. [3–3] Hess, M. Sulikowski.

220c. Organic Chemistry Structure and Mechanism. Introduction to advanced topics in organic chemistry. Stereochemistry and conformational analysis, mechanisms of organic reactions, linear free-energy relationships, reactive intermediates. Three lectures and one recitation hour per week. FALL. [4] G. Sulikowski, Johnston.

221. Laboratory Techniques in Organic Chemistry. Advanced work in organic preparations, new synthetic techniques, and modern organic analytical methods, including infrared and nuclear magnetic resonance. Prerequisite: 220b. One lecture and two laboratory periods per week. [3] (Not currently offered)

222. Physical Organic Chemistry. Structure and bonding in organic molecules. Reactive intermediates and organic reaction mechanisms. Prerequisite: 220b, 231. SPRING. [3] Kaszynski.

223. Advanced Organic Reactions. A comprehensive study of the synthesis and behavior of organic compounds based on electronic theory. Prerequisite: 220a–220b and 221, 230, 231, 236, and 237, or special consent of instructor. Three lectures per week. SPRING. [3] G. Sulikowski.

224. Bioorganic Chemistry. Essential metabolites including vitamins, steroids, peptides, and nucleotides. Consideration of phosphate esters and the synthesis of oligodeoxynucleotides. Prerequisite: 220a–220b. Three lectures per week. FALL, SPRING. [3] Rizzo, Lowe.

225. Spectroscopic Identification of Organic Compounds. Theoretical and practical aspects of spectroscopic methods, with an emphasis on NMR spectroscopy, for structural characterization of organic compounds. Prerequisite: 220b. [3] (Not currently offered)

226. Medicinal Chemistry. Drug design and development; drug interactions with receptors, enzymes, and DNA; selected therapeutic areas. Some organic synthesis. Prerequisite: 220a–220b and 219a–219b. FALL. [3] Lybrand.

230. Physical Chemistry I. Chemical kinetics and principles of quantum chemistry applied to molecular structure, bonding, and spectroscopy. Prerequisite: Math 150a–150b or Math 155a–155b and Physics 116a–116b or Physics 117a–117b. No credit for graduate students in chemistry. FALL. [3] Rosenthal.

231. Physical Chemistry II. Chemical thermodynamics and equilibrium, their statistical foundation, and applications to chemical phenomena. Prerequisite: Math 150a–150b or Math 155a–155b and Physics 116a–116b or Physics 117a–117b. No credit for graduate students in chemistry. SPRING. [3] Meiler.

232. Quantum Chemistry. Limits of classical mechanics at the atomic and molecular level; the postulates of quantum mechanics applied to problems in one, two, and three dimensions; perturbation and other methods. Prerequisite: 231 or equivalent. FALL. [3] Stone.

233. Molecular Modeling Methods. Introduction to theory and practice of computer simulation studies of molecules with emphasis on applications to biological molecules and complexes. Discussion of background theory, implementation details, capabilities and practical limitations of these methods. Prerequisite: 231. Three lectures and one three-hour laboratory per week. SPRING. [4] Lybrand.

234. Spectroscopy. Experimental and theoretical aspects of spectroscopy. Energy levels, selection rules, and spectral transitions as related to atomic and molecular structure. Design of contemporary magnetic resonance and optical spectroscopy measurements. Prerequisite: 231. SPRING. [3] Stone.

235. Surface and Polymer Chemistry. An introduction to the physics and chemistry of surface phenomena and of colloidal and macromolecular systems. Applications of thermodynamic, kinetic, and spectroscopic principles to the study of phase boundary problems in chemistry. Prerequisite: 230 or consent of instructor. [3] (Offered Fall 2007)

236. Physical Chemistry Laboratory. 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. Prerequisite: calculus through Math 175 recommended. FALL. [1] Tellinghuisen.

237. Experimental Spectroscopy. Experiments in ultraviolet, visible, infrared, and Raman spectroscopy of atoms and molecules, with application to lasers, photochemistry, and kinetics. Data analysis and presentation. No credit for graduate students in chemistry. One three-hour laboratory and one lecture per week. Prerequisite: 230 and 236; Math 175. SPRING. [2] Tellinghuisen.

238. Computational Structural Biochemistry. Theoretical and practical aspects of modeling protein structure and interactions computationally. Sequence-sequence alignments, secondary structure prediction, fold recognition, de novo structure prediction. Protein design, protein-protein docking, protein-ligand docking. Prerequisite: 231. [4] (Not currently offered)

250. Chemical Literature. Assigned readings and problems in the nature and use of the chemical literature. Prerequisite: one year of organic chemistry. SPRING. [1] K. Porter.

301a–301b. Chemistry Seminar. [1–1] Bachmann, Rizzo.

304. Special Topics in Inorganic Chemistry. SPRING. [3] Hanusa. (Offered on demand)

306. Physical Methods in Inorganic Chemistry. Application of spectroscopic methods to inorganic chemistry. Discussion of symmetry and group theory as required for the use of spectroscopic methods is also included. [3] (Not currently offered)

311. Advanced Analytical Chemistry I. Analytical spectroscopy, mass spectrometry, design and analysis of experiments. FALL. [3] McLean.

313. Advanced Analytical Chemistry II. Signal processing, separation science, and electrochemical methods. SPRING. [3] Cliffel.

314a–314b. Special Topics in Analytical Chemistry. 314a: FALL. [3] Bornhop.

316. Problem Solving in Analytical Chemistry. Application of analytical reasoning and methodology development to the design and completion of an experimental laboratory project. SPRING. [3] Hercules.

324. Special Topics in Organic Chemistry. SPRING. [3] Johnston.

326. Readings in Organic Chemistry. Current topics in organic literature. May be repeated for a total credit of 3 hours. Prerequisite: 222 or 223. [1–1] Organic chemistry faculty. (Not currently offered)

330. Advanced Quantum Chemistry. Advanced topics in the application of quantum mechanics to chemical bonding and spectroscopy. Prerequisite: 232. SPRING. [3] Staff. (Offered on demand)

331. 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: 232. [3] Staff. (Not currently offered)

332. Special Topics in Chemical Physics. FALL, SPRING. [3] Staff.

335. Thermodynamics and Kinetics of Inorganic and Organic Materials. Equilibrium in chemical and physical processes of ideal and real systems. Reaction rates for elementary mechanisms. Credit not given for both 335 and 230 or 231. [3] (Not currently offered)

336. Biochemical Toxicology and Carcinogenesis. (Also listed as Biochemistry 336) Chemical and biological aspects of toxicology and carcinogenesis, including basic principles and mechanisms, metabolism and enzymology, molecular biology, chemistry of reactive intermediates, and a survey of several classes of environmentally important compounds. Prerequisite: a course in general biochemistry or consent of instructor. Three lectures per week. FALL. [3] Guengerich (Biochemistry) and Staff.

340. Applications of Group Theory. Molecular symmetry, point groups, and character tables. Application to molecular orbitals, vibrational spectra, organic and inorganic systems. SPRING. [3] Polavarapu.

350. Materials Chemistry. A survey of modern materials chemistry with an emphasis on the chemistry related to the preparation, processing, identification, analysis, and applications of materials. FALL. [3] Harth.

360. Practicum in Chemistry Instruction. Preparation for and the teaching of chemistry to undergraduate students. No credit for chemistry graduate students. FALL, SPRING. [0] Staff, Phillips.

369. Master's Thesis Research.

380. Introduction to Research. Introduction to chemical research under the guidance of individual faculty members. Students participate in three rotations among faculty research groups and provide graded work. For chemistry graduate students only. FALL, SPRING, SUMMER. [1–2] Bachmann, Rizzo.

385. Advanced Reading in Chemistry. Specialized topics under the guidance of a departmental faculty member. Open to qualified graduate students only. FALL, SPRING. [3] Porter.

399. Ph.D. Dissertation Research.

Chinese

SENIOR LECTURER Xianmin Liu
LECTURERS Yong Chen, Qing Wei

☙ COURSES in Chinese are available for minor credit in master's degree programs only. Students should consult their advisers about the acceptability of the courses as related work.

201–202. Elementary Chinese. Introduction to modern Chinese pronunciation, grammar, conversation, reading, and writing. [5–5] Liu, Wei, Chen.

214–216. Intermediate Chinese. Language training in oral and written Chinese. Prerequisite: 201–202. [5–5] Liu, Wei, Chen.

231. Calligraphy. Basic skills of writing standard script *kaishu.* Basic aesthetic of Chinese calligraphy. No Chinese language background necessary. [1] Liu.

241–242. Advanced Chinese. Readings in Chinese culture to enhance proficiency in oral and written Chinese. Prerequisite: 214–216. [3–3] Chen.

251-252. Intensive Readings in Chinese. Readings and discussion of selected Chinese newspapers, journals, magazines, and books related to social, economic, legal, and political issues in contemporary China. Prerequisite: 241–242. [3–3] Liu.

289a–289b. Independent Study. A reading course, the content of which varies according to the need of the individual student. Primarily designed to cover pertinent material not otherwise available to the student in the regular curriculum. [Variable credit: 1–3] Liu.

Civil Engineering

CHAIR David S. Kosson
DIRECTOR OF GRADUATE STUDIES Prodyot K. Basu
PROFESSORS EMERITI Paul Harrawood, Peter G. Hoadley, Richard E. Speece, Edward L. Thackston
PROFESSORS Mark David Abkowitz, Prodyot K. Basu, David S. Kosson, Sankaran Mahadevan, Frank L. Parker
RESEARCH PROFESSOR Malcolm E. Baird
PROFESSORS OF THE PRACTICE James H. Clarke, Sanjiv Gokhale
ASSOCIATE PROFESSORS Alan R. Bowers, Eugene J. LeBoeuf, Robert E. Stammer Jr.
ASSOCIATE PROFESSOR OF THE PRACTICE John R. Veillette
ASSISTANT PROFESSORS Caglar Oskay, Harold S. Park, Florence Sanchez, Lori Troxel, Luoyu (Roy) Xu
RESEARCH ASSISTANT PROFESSORS Edsel Daniel, James R. Dobbins, Andrew C. Garrabrants, Leslie Shor
ADJUNCT PROFESSORS Curtis Byers, Gregory Cashion, Vic McConnell

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

DEGREE programs at the M.S. and Ph.D. level are offered in structural engineering, structural mechanics, and transportation engineering, and at the M.S. level in construction management. M.S. and Ph.D. programs in environmental engineering are offered by the graduate program in that subject.

The Ph.D. requires a minimum of 36 hours of formal course work and a dissertation. The M.S. degree has two options: (1) 24 hours of graduate-level course work and a research thesis, or (2) 30 hours of graduate-level course work.

The master of engineering degree, an advanced professional degree for engineers, is offered by the School of Engineering.

251. Foundation Analysis and Design. Shallow and deep foundation elements and systems for civil engineering structures. Soil exploration and site investigation. Prerequisite: 240 or equivalent. SPRING. [3]

252a–252b. Civil and Environmental Engineering Seminar. A two-part seminar series designed to introduce students to current technical and professional issues through literature discussions, seminars by faculty and practicing engineers, and participation in panel discussions. Prerequisite: senior or graduate standing or consent of instructor. FALL, SPRING. [1–1] Staff.

255. Transportation System Design. The geometric analysis of transportation ways, with particular emphasis on horizontal and vertical alignment. Design of highways, interchanges, intersections, and facilities for air, rail, and public transportation. Prerequisite: 225, Transportation Systems Engineering. SPRING. [3] Stammer.

256. Urban Transportation Planning. Analytical methods and the decision-making process. Transportation studies, travel characteristic analyses, and land-use implications applied to surface transportation systems. Emphasis on trip generation, trip distribution, modal split, and traffic assignment. Computerized planning programs are used. Prerequisite: 225, Transportation Systems Engineering. SPRING. [3] Staff.

257. Traffic Engineering. Analysis of the characteristics of traffic, including the driver, vehicles, volumes, speeds, capacities, roadway conditions, and accidents. Traffic regulation, control, signing, signalization, and safety programs are also discussed. Prerequisite: 225, Transportation Systems Engineering. FALL. [3] Stammer.

259. Geographic Information Systems. Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and Internet delivery. GIS software utilization and individual projects. SPRING. [3] Staff.

262. Intelligent Transportation Systems. Elements of intelligent transportation system (ITS) architecture. Survey of component systems. Analysis of potential impacts. Field operational tests, analysis methods, deployment initiatives and results. Prerequisite: 257 or graduate standing. SPRING. [3] Staff.

286. Construction Project Management. Introduction to the theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Broad 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. Prerequisite: CE 235 or consent of instructor. FALL. [3] Gokhale.

287. Construction Estimation. Fundamentals of construction estimating. Estimation of material, labor, and equipment quantities, including costing and pricing of projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: 286. FALL. [3] Gokhale.

288. Construction Planning. 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 preconstruction through operation and maintenance. Use of real-world examples and project scheduling software. Prerequisite: 286 and 287. SPRING. [3] Gokhale.

290. Reliability and Risk Case Studies. Review of case studies involving successes and failures in managing reliability and risk assessment of engineering systems from a wide range of perspectives, including design, production, operations, organizational culture, human factors, and exogenous events. Analysis of event consequences in terms of public health and safety, the environment and business continuity, and the implications on regulation, legal liability, and business practices. Evaluation of 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 or consent of instructor. FALL. [3] Abkowitz.

292. Construction Law and Contracts. 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: 286. SPRING. [3] Staff.

293. Advanced Structural Steel Design. 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 like multistory buildings including computer applications. Prerequisite: 235. FALL. [3] Troxel.

294. Advanced Reinforced-Concrete Design. 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. Introduction to prestressed concrete. Prerequisite: 235. SPRING. [3] Troxel.

295. Mechanics of Composite Materials. 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: 182 and MSE 150. SPRING. [3] Staff.

299. Special Topics. Special topics of interest to staff and students based on departmental research or current developments in civil engineering. FALL, SPRING. [3] Staff.

301. Advanced Mechanics of Solids I. Stress and strain analysis: equilibrium, compatibility, and constitutive equations including linear elastic and thermo-elastic relations; transformations; octahedral and deviatoric stresses. Applications to the torsion of bars, stress concentrations, and semi-infinite medium problems. Euler-Bernoulli and Timoshenko beam theories. Energy and related methods including applications. Kirchoff's bending of rectangular and circular plates. Prerequisite: 182 or equivalent, Math 198 or equivalent, Math 194 or equivalent, or consent of instructor. FALL. [3] Xu.

302. Advanced Mechanics of Solids II. Modes of failure: creep and relaxation, plastic flow, fracture and fatigue. Stability of members, frames, and plates. Membrane and bending analyses of shells, including the beam on elastic foundation analogy for cylindrical shells. Inelastic behavior and plasticity including frame, planar, axi-symmetric, and slip line problems. Prerequisite: 301 or consent of instructor. SPRING. [3] Xu.

307. Finite Element Analysis. 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. One-D problems of the continua and finite element solution-Co and C1 elements, eigenvalue and transient problems. Error checks and control. Mapping, shape functions, numerical quadrature, and solution of equations. Finite element formulation of two-dimensional problems (single and multi-field)-mapping and shape functions, triangular and quad elements with straight or curved boundaries. Application problems in 1-D, 2-D and 3-D. Three-D elements, singular problems, and elements of buckling and nonlinear problems. Error estimation and quality control. Computer implementation. Commercial packages. Prerequisite: Math 194 and Math 226 or equivalent, or consent of instructor. FALL. [3] Park.

308. Advanced Computational Mechanics. Basics of 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 problems. Multidisciplinary problems. Error estimation and adaptive model improvement. Multiscale modeling and atomistic/continuum coupling. Prerequisite: 307 or equivalent. SPRING. [3] Staff.

309. Structural Dynamics and Control. Analysis of single- and multi-degree-of-freedom systems. Modal superposition method. Time and frequency domain analyses. Numerical methods and introduction to nonlinear dynamic analysis. Applications 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] Basu.

310. Probabilistic Models in Engineering Design. (Also listed as MT 312) Applications of probabilistic models 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. Emphasis on applications in civil, mechanical, and chemical engineering. Prerequisite: Math 230 or consent of instructor. FALL. [3] Mahadevan.

311. Engineering Design Optimization. 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 287, Math 288 or CS 257, CE 310. [3] (Offered on demand)

313. Advanced Reliability Methods. Computational methods for probabilistic analysis and design of modern engineering systems. Emphasis on system reliability, nonlinear reliability methods, Weibull analysis, Bayesian methods, response surface modeling and design of experiments, advanced simulation and variance reduction concepts, sensitivity analysis and reliability-based design optimization. Practical applications using existing software. Prerequisite: 310. SPRING. [3] Mahadevan.

317. Stability of Structures. Buckling analysis of perfect and imperfect columns, mathematical treatment of various stability problems and stability criteria, dynamic and static instability, energy methods. Buckling of frames, trusses, beam-columns, rings, and tubes. [3] Basu. (Offered on demand)

318. Prestressed Concrete. Behavior and design of statically determinate prestressed concrete structures under bending moment, shear, torsion, and axial load effects. Design of statically indeterminate prestressed structures like continuous beams, frames, slabs, and shells. Creep and shrinkage effects and deflections of prestressed concrete structures. Applications to the design and construction of bridges and buildings. Prerequisite: 235 or equivalent. [3] Basu. (Offered on demand)

325a–325b–325c. Individual Study of Civil Engineering Problems. Literature review and analysis of special problems under faculty supervision. [Variable credit: 1–4 each semester]

351. Public Transportation Systems. Study of public transportation, with emphasis on planning, management, and operations; paratransit, ridesharing, and rural public transportation systems. Prerequisite: 256. [3] (Offered on demand)

353. Airport Planning and Design. 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: 225, Transportation Systems Engineering, or consent of instructor. [3] Staff. (Offered on demand)

355. Advanced Transportation Design. An in-depth view of the design process. Complex design problems and solutions. Computer-based analytical and design tools. Comprehensive design projects. Prerequisite: 255. [3] (Offered on demand)

356. Advanced Transportation Planning. A continuation of the concepts from CE 256. Analytical techniques used in forecasting travel. Computer-based models, transportation and energy contingency planning methods. Prerequisite: 256. [3] (Offered on demand)

357. Theory of Traffic Flow. 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: 257. [3] Staff. (Offered on demand)

359. Emerging Information Systems Applications. (Also listed as MT 359) An introduction to emerging information systems technologies and their role in improving productivity and efficiency 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, or consent of instructor. FALL. [3] Staff.

369. Master's Thesis Research. [0]

371a–371b. Reliability and Risk Engineering Seminar. Seminars by expert speakers will 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. [1–1]

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

399. Ph.D. Dissertation Research.

Classical Studies

CHAIR Barbara Tsakirgis
DIRECTOR OF GRADUATE STUDIES Kathy L. Gaca
PROFESSOR EMERITUS Robert Drews
PROFESSORS Thomas A. J. McGinn, Jack M. Sasson, Susan Ford Wiltshire
ASSOCIATE PROFESSORS Kathy L. Gaca, F. Carter Philips, Barbara Tsakirgis
ASSISTANT PROFESSORS Amanda Krauss, David Petrain
SENIOR LECTURERS Kieran Hendrick, Daniel P. Solomon

DEGREES OFFERED:

CLASSICS. *Master of Arts, Doctor of Philosophy*

THE department maintains a small and select graduate program. The M.A. program enables students either to become Latin teachers in secondary schools or to prepare themselves for admission to a Ph.D. program. Upon entering the M.A. program a student should be able to read Greek and Latin at an advanced undergraduate level, and should also have begun the study of either French or German. The program requires 36 hours of course work, some of which may be taken in closely related fields outside the department such as philosophy, religious studies, comparative literature, history, or art history. The program also requires the writing of an M.A. paper, and the passing of proficiency examinations in Greek, Latin, history, art and archaeology, and a modern foreign language.

In appropriate circumstances the department accepts applicants finishing an M.A. degree into its Ph.D. program. Such applicants must be highly qualified and highly motivated, capable of progressing to professional competence in a program in which seminars are necessarily complemented by extensive independent study. It is expected that all students in the M.A. and Ph.D. programs will enroll in all departmental seminars; normally four seminars are offered annually.

As in all of its graduate programs, the department encourages breadth rather than specialization for Ph.D. candidates. These students should acquire familiarity with classical antiquity as a whole: history, literature, philosophy and religion, art and architecture. In addition, students are invited to acquire an elementary acquaintance with one or more related fields, such as the ancient Near East, early Christianity, medieval history, Roman law, Greek and Roman social history, or the classical tradition in America. Courses on these subjects, whether offered in this department or in other programs of the Graduate School, may be used to satisfy degree requirements.

Greek

201. Beginning Greek I. (Formerly 101) The elements of classical Greek. Reading of simplified texts from authors of the fifth and fourth centuries B.C. FALL [4] Philips.

202. Beginning Greek II. (Formerly 102) Continuation of 201. Completion of the elements of classical Greek through readings from classical authors. Introduction to Homeric and Hellenistic Greek. Prerequisite: 201 or departmental placement. SPRING. [4] Hendrick.

203. Intermediate Greek I: Classical and Koiné Greek. Review of Greek grammar, and reading from classical and biblical texts. Prerequisite: 202. FALL. [3] Gaca.

204. Intermediate Greek II: Homer's *Iliad.* Selected reading and interpretation; history and literary characteristics of the Homeric epic; practice in reading of meter. Prerequisite: 203. SPRING. [3] Philips.

212. The Greek Historians. 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: 204. [3] Hendrick.

215. The Greek Tragedians. 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: 204. SPRING. [3] Philips.

216. Readings in Plato and Aristotle. 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: 204. [3] (Offered 2007/2008)

218. Greek Lyric Poetry. The Greek melic, elegiac, and iambic traditions, with an introduction to the Greek dialects and special emphasis on Archilochus, Tyrtaeus, Alcaeus, and Sappho. Prerequisite: 204. [3] (Offered 2007/2008)

240. The Gospels in Greek. Matthew and selections from the other Gospels. Prerequisite: 203 or departmental placement. [3] (Not currently offered)

277. Readings in Greek Philosophy. Selected readings from the dialogues of Plato and from the ethical writings of Aristotle. Corollary readings and discussion of the pre-Socratic and post-Aristotelian schools. Paper and reports required. Prerequisite: 3 hours above 204. [3] (Not currently offered)

289. Independent Study. Designed for majors wanting to familiarize themselves with works and authors not covered in the regular curriculum. Prerequisite: 6 hours above 204. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed a total of 6]

313. Seminar in Classical Greek Prose. May be repeated for credit with change of subject matter. [3] (Offered 2007/2008)

314. Seminar in Classical Greek Poetry. May be repeated for credit with change of subject matter. SPRING. [3] Gaca.

320. Seminar in Early Greek Poetry. [3] (Offered 2007/2008)

Latin

101G. Latin Reading Course for Graduate Students. One semester survey of grammar and vocabulary coupled with extensive reading and exercises. Available to graduate students for "no credit" only. Three hours per week. [0] (Not currently offered)

201. Catullus. Reading and interpretation of Catullus' poems; aesthetic, political, and rhetorical contexts; fundamentals of Latin meter. Prerequisite: 104 or departmental placement. [3] (Offered 2007/2008)

202. Ovid. Reading and interpretation of selections from the *Metamorphoses* or other works of Ovid. Prerequisite: 104 or departmental placement. FALL. [3] Krauss.

203. The Lyric Poetry of Horace. Reading and interpretation of Horace's *Epodes* and *Odes*; relation to the Greco-Roman lyric tradition and to Augustan politics. Prerequisite: 104 or departmental placement. SPRING. [3] Solomon.

205. Latin Letters. The literary letters of Seneca and Pliny, with a brief introduction to the personal correspondence of Cicero and the letters discovered at Vindolanda. Prerequisite: 104 or departmental placement. [3] (Offered 2007/2008)

206. Cicero and the Humanistic Tradition. Study of Cicero's career and thought, and of his contribution to the development of the concept of *humanitas*. Readings from his letters, speeches, and philosophical works. Prerequisite: 104 or departmental placement. SPRING. [3] Gaca.

212. Roman Comedy. Reading of selected comedies of Plautus and Terence; study of the form of Roman comedy and its relation to Greek New Comedy. Prerequisite: 104 or departmental placement. [3] (Offered 2007/2008)

215. The Roman Historians. 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: 104 or departmental placement. [3] (Offered 2007/2008)

220. Vergil: *The Aeneid.* An intensive study of the entire poem, in the context of the epic tradition. Prerequisite: 104 or departmental placement. FALL. [3] Wiltshire.

260. Early Christian Writers. Selections from the writings of Latin Christians, from the account of Perpetua's martyrdom to the *Confessions* of Augustine. Prerequisite: 3 hours above 104. [3] (Not currently offered)

264. Roman Satire. The satires of Horace and Juvenal; the origins of Roman satire; history and conventions of the genre; background reading in other Roman satirists. Prerequisite: 3 hours above 104, Intermediate Latin II. [3] (Offered 2007/2008)

268. Lucretius: *De Rerum Natura*. 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: 3 hours above 104, Intermediate Latin II. SPRING. [3] Petrain.

289. Independent Study. Designed for majors wanting to familiarize themselves with works or authors not covered in the regular curriculum. Prerequisite: 6 hours above 104, Intermediate Latin II. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed a total of 6]

313. Seminar in Classical Latin Prose. May be repeated for credit with change of subject matter. FALL. [3] Petrain.

314. Seminar in Classical Latin Poetry. May be repeated for credit with change of subject matter. SPRING. [3] Wiltshire.

Classics

Courses below the 300 level require no knowledge of either Greek or Latin.

203. Aegean Art and Archaeology of the Bronze Age. The art and archaeology of the major cultures around the Aegean Sea between 3000 and 1000 B. C.: Minoan, Helladic or Mycenaean of the Greek mainland, Cycladic and those of Anatolia. No credit for students who have completed 223. [3] Tsakirgis. (Not currently offered)

204. Archaic and Classical Greek Art and Architecture, 1000 to 400 B.C. Sculpture, vase painting, architecture, and the minor arts from about 1000 B.C. to the late fifth century B.C. Formal and stylistic developments in relation to changing cultural background. No credit for students who have completed 227. [3] Tsakirgis. (Offered 2007/2008)

205. Late Classical Greek and Hellenistic Art and Architecture. Sculpture, vase painting, architecture, and the minor arts from after the Parthenon to the Roman Empire. A focus on those media (wall painting and mosaic) which develop significantly in this period. [3] Tsakirgis. (Not currently offered)

206. Roman Art and Architecture. Sculpture, architecture, and painting from the tenth century B.C. to the early fourth century A.D. Daily life of the Romans as seen in the towns of Pompeii and Herculaneum. No credit for students who have completed 228. SPRING. [3] Tsakirgis.

207. History of the Ancient Near East. (Also listed as History 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] (Offered 2007/2008)

208. History of Greece, to Alexander the Great (Formerly 208a; also listed as History 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. FALL. [3] Hendrick.

209. Greece and the Near East from Alexander to Theodosius (Formerly 208b; also listed as History 209) From Alexander's conquest of the Persian Empire to the ascendancy of Christianity in the late fourth century. Emphasis on social, cultural and religious transformations, within the framework of political history. SPRING. [3] Hendrick.

211. The Greek City. The example of ancient Athens. The stoa, the theater, the house, and fortifications. Institutions such as the courts, the public assembly, and the family. Literary, historical, archaeological, and philosophical sources. [3] Tsakirgis. (Offered 2007/2008)

212. History of the Roman Republic. (Also listed as History 210) 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. No credit for students who have had the former 209 (History of Rome). [3] (Offered 2007/2008)

213. History of the Roman Empire. (Also listed as History 211) 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. No credit for students who have had the former 209 (History of Rome). [3] (Offered 2007/2008)

216. Greek Sculpture. Style, materials, and techniques ca. 900–31 B.C. The sculptor's craft and reasons for the creation of both free-standing and architectural sculpture. SPRING. [3] Tsakirgis.

217. Art and Architecture of Ancient Egypt. 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] Tsakirgis. (Offered 2007/2008)

220. Women, Sexuality, and the Family in Ancient Greece and Rome. The status and role of women, law and the regulation of the private sphere, sexuality and gender role, demography and family structure, marriage, children, religion, domestic architecture and the household economy, ancient critiques of the family, and the impact of Christianity. FALL. [3] Krauss.

222. Classical Tradition in America. Influences of classical Greece and Rome on the literature, politics, architecture, and values of the United States from the colonial period to the present. SPRING. [3] Wiltshire.

224. Ancient Origins of Religious Conflict in the Middle East. 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. FALL. [3] Drews.

231–232. Akkadian. A two-semester 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). FALL, SPRING. [3–3] Sasson.

236. Culture of the Ancient Near East. A survey of highly sophisticated Near East cultures of the last three millennia before the common era (B.C.E.). Discussion of political histories, and the social, religious, and intellectual heritage of Mesopotamia, Egypt, and Anatolia through excavated artifacts and written documents. [3] Sasson. (Not currently offered)

238. The Amarna Age. 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 Thutmoses III, Suppiluliumas, Ramses II, and the spiritually influential Akehnaten. [3] Sasson. (Not currently offered)

305. Seminar in Classical Art and Architecture. May be repeated for credit with change of subject matter. [3] Tsakirgis. (Not currently offered)

309. Seminar: Studies in Ancient History. May be repeated for credit with change of subject matter. [3] (Not currently offered)

355. Seminar in Classics. [3] (Not currently offered)

369. Master's Thesis Research. [0]

398. Independent Study. An individual reading and study program on an author or area of classical antiquity not treated in the regular curriculum. No formal instruction is given, but the student's work is supervised and evaluated by one or more members of the staff. Up to 12 hours of 398 may be earned, but no more than 3 hours in any one semester. Open only to students who have completed one year of graduate study in classics. FALL, SPRING. [Variable credit: 1–3]

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Community Research and Action

CHAIR Joseph J. Cunningham
DIRECTOR OF GRADUATE STUDIES Isaac Prilleltensky
PROFESSOR EMERITUS John R. Newbrough
PROFESSORS Leonard Bickman, Paul Dokecki, Carolyn Hughes, William L. Partridge, Isaac Prilleltensky, Kenneth A. Wallston
PROFESSOR OF THE PRACTICE Vera Stevens Chatman
ASSOCIATE PROFESSORS Joseph J. Cunningham, Craig Anne Heflinger, Robert B. Innes, Douglas D. Perkins, Paul W. Speer
ASSISTANT PROFESSOR Maury Nation

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

☙ THE graduate program in community research and action is an interdisciplinary program combining community psychology, with its emphasis on rigorous applied research, and community development, with its strong tradition of empirically grounded practice. It is designed to train action-researchers in applied community studies in one of two areas of specialization: community development or evaluation methods. It serves doctoral students who desire advanced preparation in community research methods and work at higher levels in community and governmental organizations or who are preparing themselves for academic positions. The Ph.D. degree includes (a) a core set of courses covering community psychology, community development, ethics, public and community health, and organizational theory and change; (b) research methodology covering quantitative and qualitative methods, action research, field research, and program evaluation; (c) advanced content areas; and d) minors that are designed individually, drawing from within the University, from other departments and schools (e.g., sociology, economics, divinity), and from other departments and specializations within Peabody College (e.g., leadership and organizations, quantitative psychology). Planning is done with the major professor and approved by the student's committee. Students are expected to take a master's degree as part of their doctoral studies. Students entering with a nonempirical master's degree are expected to complete an empirical study.

3000. Becoming an Agent of Change. This course is designed with first-semester master's students in the Departments of Human & Organizational Development and Leadership & Organization in mind. The primary goal is to provide the foundation for graduate study in both Organizational Leadership and Human, Organization, & Community Development. Three secondary goals are (1) to introduce students to graduate-level skills for identifying and critically analyzing scholarly research; (2) to allow students to process, at a more intellectual level, past internships, service-learning course projects, or independent community service experiences; and (3) to begin preparing for the required M.A. practicum and other future field training, jobs, and community service. There will be an overview of historical and current theory, research, and practice in both the field of organization development and the field of community development. Any type of organization (public, private-nonprofit, private-for-profit, grassroots-volunteer) or community (urban, rural, non-place-based) may be considered. Organizations and community

interventions that encourage participation and promote lifespan human development, health, and cultural diversity, especially those emphasizing learning and problem solving, will provide the most relevant and useful case studies. [3]

3100. Community Inquiry. Overview of issues and methods in community research. Epistemology, theory, research design, critical analysis, levels of inquiry and the range of data collection and analysis methods available for community research.

3200. Ethics of Community Research and Action. This course is intended to develop the ability to analyze situations encountered by action-researchers in community psychology, community development, prevention and community health/mental health, organizational change, community studies, and related community-based professional activities from the perspectives of (1) practice ethics, (2) research ethics, (3) policy ethics, and (4) the ethical/value issues entailed in conceptualizing the "ideal" community or society. SPRING. [3] Dokecki.

3470. Community Psychology. (Also listed as Psychology and Human Development 347P) Introduction to theory, research, and action in community psychology, the study and application of psychological solutions to social and mental health problems at the community, organizational, and societal levels. The course overviews values in the field; the history of mental health care and individualistic psychology; ecological theory; stress, coping, and social support; conceptions of community environments; prevention; self-help; empowerment; organizational change; under-served populations; the role of research in social intervention and policy; and community development. FALL. [3] Prilleltensky.

3600. Community Development and Urban Policy. This course provides the beginning graduate student with an introduction to theory, practice, and research in Community Development (CD) and in urban social policy. It has a laboratory portion in which the student works on a CD project in the local community and uses that to propose to the relevant authorities a new social policy to implement the findings of the CD project. SPRING. [3] Staff.

3610. Development Project Design and Evaluation. This course examines how development projects and programs intended to improve social, economic, health, energy, environmental, and other conditions in human communities are designed by development professionals and how they determine whether or not such interventions achieve their purposes and warrant similar investment in the future. Analytical work undertaken at several stages in the design and evaluation process, including social, financial, managerial, legal, environmental, and other analyses, as well as impact analysis, are carried out. The purpose is to understand the ways applied research underpins and influences development investment decisions. [3]

3621. Theory and Application in Action Research. This is a core course in the Community Research and Action (CRA) doctoral program. It is designed as a course providing students with both intellectual and practical exposure to action research and applied research methods—particularly in relation to working for social change. The course will focus on the issue of knowledge generation and the role of knowledge production in social power. Practical experience will be gained by conducting research on community projects and applying the concepts gained in course work. Prerequisite: one graduate statistics course. [3]

3640. Global Dimensions of Community Development. The course is designed to (a) provide in-depth understanding of the nature, structure, functioning, and development of community organizations in societies different from our own as they relate to (b) multilateral or global organizations that span different societies and nation states. A major goal is to prepare students for work in cross-cultural settings, in organizations characterized by cultural diversity, or in institutional contexts that serve a culturally diverse clientele. To do this, the course explores the economic globalization process and the cultural and social

responses to globalization in various parts of the world. The main focus will be upon analysis of differing ways that people in communities are organizing themselves to realize their human potential in the context of globalization and the nascent emergence of global communities. FALL. [3] Partridge.

3660. Faith and Politics in Community . The intersection between religion and politics, especially its form within local communities of the South, is the subject of this multidisciplinary seminar. The course bridges the social sciences and humanities to investigate how local cultural and religious forces propel citizens toward political and religious decisions and actions. Field research data drawn from ongoing investigations in Tennessee communities provide an empirical as well as theoretical foundation to the analysis. A number of topics will be pursued with primary focus on the problem of war. The seminar is team taught by faculty from the Law School, College of Arts and Science, Divinity School, and Peabody College. Prerequisite: permission of the instructor. [3]

3690. Master's Thesis Research. FALL, SPRING. [0] Staff.

3870. Thesis Development Seminar. The purpose of this course is to help students plan empirical M.S. theses. Students must register for both fall and spring semesters in that order. Fall will be devoted to the identification of a tentative topic or area of study. Spring will be devoted to developing a draft thesis proposal, including presentation of the problem, a critical literature review, research questions, a draft methods, and approach to data analysis sections. SPRING. [3] Perkins.

3872. Practicum. This course provides an opportunity to integrate theory, knowledge, and skills by applying them to the solution of problems in practicum sites. Prerequisite: HOD 3000. SPRING. [3]

3930. Readings and Research in Community Research and Action. Individual programs. May be repeated. Consent of instructor required. FALL, SPRING. [Variable credit: 1–3] Staff.

3960. Special Topics in Community Research and Action. May be repeated with a change in topic. FALL, SPRING. [Variable credit: 1–4] Staff.

3990. Ph.D. Dissertation Research.

Comparative Literature

DIRECTOR Earl Fitz

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

❧ THE program in comparative literature is offered under supervision of the Committee on Humanities and Comparative Literature: Earl Fitz (professor of Spanish and Portuguese and professor of comparative literature), William Franke (associate professor of comparative literature and Italian and associate professor of religious studies), Edward H. Friedman (professor of Spanish and Portuguese), John A. McCarthy (professor of German and professor of comparative literature), Robert Barsky (professor of

French and professor of comparative literature), Patricia A. Ward (professor of French and professor of comparative literature); and the dean of the College of Arts and Science, *ex officio*.

The comparative literature program emphasizes training in various methods of literary criticism and in literary history along with the study of national literatures. There is a particular emphasis on the relationship of various forms of literary theory to philosophy and religion. Programs of study are tailored to the needs of the individual.

The master's program includes at least 30 hours of formal course work, with 9 hours in comparative literature and 21 hours in literature courses in two foreign languages or in one foreign language and English. Requirements also include a reading knowledge of two foreign languages and the presentation of a thesis. A non-thesis option is open to students who have passed the qualifying examination for the Ph.D.

The doctoral program includes at least 54 hours of formal course work, with 18 hours in comparative literature and 36 hours of literature courses from the departments of Classical Studies, English, French and Italian, Germanic and Slavic Languages, and Spanish and Portuguese. Candidates must demonstrate proficiency in two foreign languages, through course work or by examination. Individual programs of concentration may require reading knowledge of a third foreign language.

The Committee on Humanities and Comparative Literature approves the student's program and supervises examinations.

202. Themes in World Literature. Analysis and discussion of major themes in a selected number of the great works of literature, philosophy, and the arts which have been important to civilizations both Western and Eastern from antiquity to 1600. [3] Staff. (Not currently offered)

203. Themes in World Literature. Analysis and discussion of major themes in a selected number of the great works of literature, philosophy and the arts that have been important to civilizations both Western and Eastern from 1600 to the present. [3] Staff. (Not currently offered)

237. Medieval Women in their Own Words. European writers from the late classical period through the Middle Ages. Autobiographies, hymns, fictions in poetry and prose with attention paid to ethnic and linguistic difference, cultural background, religious and philosophical ideas. Focus on political influence, personal relations, health and other life concerns, conditions in society, and self-perception as writers. [3] Barrett. (Not currently offered)

240. Literatures of Africa. Literatures of Africa, including works originally composed in Arabic and in French, English, or other European languages as well as in various African languages. Cultural variations are emphasized, including differences in linguistic backgrounds and religious beliefs (Islamic, Christian, and indigenous). Texts taught in translation. Authors typically included: Mafouz, Achebe, Ngugi, Soyinka, Djebar, Sembene. [3] Nzabatsinda (French). (Not currently offered)

271. Women's Writing in the Renaissance. Writing by women in England, Europe, and the Americas from 1500 to 1680. The emergence of women's literature in the age of courtly centralization and foundation of colonies. Women's entry into the public domain is seen in diverse areas of the world affected by conflict between old and new customs and beliefs, and by vision of new geographies outlining unusual spaces. Authors typically included: Maria de Zayas, Ann Bradstreet, Lady Mary Wroth, Sor Juana de la Cruz. [3] Staff. (Not currently offered)

278. Colonial and Post-Colonial Literature. Literature from countries colonized by Europe from eighteenth to twentieth century. Examines implications of colonial encounter, and formation of idea "post-colonial" culture. Subjects include language, freedom and agency, gender roles, representation of space, relation between power and narrative. Such authors as: Foster, Coetzee, Okri, Tagore, Chatterjee, Kincaid, Rushdie, Soyinka. SPRING. [3] Barsky.

285. Inter-American Literature: The Pre-Columbian Period through the Eighteenth Century. Orality vs. the written tradition; the legacy of Native American literature; the literature of conquest, resistance, and colonization; colonial letters in North, Central, and South America; the origins of inter-American cultural relations; the eighteenth century in the Americas. Authors may include: Galeano, Bernal Diaz, Sor Juana Inés de la Cruz, Brian Moore, Condé, and Naipaul. [3] Fitz, Staff. (Not currently offered)

286. Inter-American Literature: The Nineteenth Century. The coming of age of New World literature; the impact of Romanticism on cultural formation and independence; Native Americans in this process; New World nation-states and national literatures; slavery and race relations; the theme of miscegenation; issues of influence and reception; the rise of the New World novel; Naturalism in the Americas. Readings may include the following authors: Alencar, Henry James, Whitman, Machado de Assis, and Stowe. [3] (Not currently offered)

287. Inter-American Literature: The Twentieth Century to the Present. Rodó and the United States: Modernism in the Americas; Depression era literature; the impact of Faulkner; the 1960s and the rise of the "new novel"; "realismo mágico" and its impact in Brazil, the United States, and Canada; the politics and aesthetics of translation; the emergence of inter-American literature as an academic discipline. Readings may include Machado de Assis, Borges, Barth, Márquez, Fuentes, and Brossard. [3] (Not currently offered)

290. Seminar in Methods in Comparative Literature and Theories of Reading and Interpretation. Reading methods, critical approaches including reception, aesthetic, formalism(s), and symbolic, psychological, and structure approaches. Interdisciplinary study and the methodologies of the disciplines; problems of setting side by side works of different cultures; uses and abuses of translation. Limited to seniors and graduate students. Prerequisite: 140–141 and one upper-division course, which may be taken concurrently. [3] (Not currently offered)

294a–294b. Special Topics in Comparative Literature. Topics of special interest, as announced in the *Schedule of Courses*. FALL. [3–3] Somekh.

311. The Figure of Greece in European Romanticism. The impact of Greece on the Romantics, especially their rethinking of history. [3] (Not currently offered)

312. Varieties of Twentieth Century Poetics. Text-based, rather than contextual, approaches to literary works: New Criticism, Chicago neo-Aristotelianism, symbolic criticism of Northrop Frye, Russian formalism, Prague structuralism, Soviet semiotics, romance philology, French structuralism and poststructuralism. [3] (Not currently offered)

313. Literary Analysis and Theory. Methods of literary analysis for the teaching of literature. The systematic application of contemporary theories—structuralist and post-structuralist—in the analysis of poetry and narrative. [3] (Not currently offered)

314. Anatomy of Criticism. Close analysis of the seminal theoretical texts of Northrop Frye, principally *The Great Code: The Bible and Literature, Words of Power: Being a Second Study of "The Bible and Literature"* and the *Anatomy of Criticism* itself. [3] (Not currently offered)

315. Science and Literature: Creativity and Metaphor. Creative mirrorings of innovative reconfigurations in science and literatur e. Authors include Goethe, Dostoyevsky , Borges, Kafka, Wiesel, Koyre, Prigogine. [3] McCarthy. (Not currently offered)

318. The Boundaries of Genre. Essay, aphorism, letter, maxim, preface, review. The ethics of reading and writing with examples from philosophy, history, and cultural criticism. Montaigne, Bacon, Lessing, Goethe, Diderot, Sainte-Beuve, Lamb, Emerson, Freud, Salvador de Madariaga. [3] McCarthy (Germanic and Slavic Languages). (Not currently offered)

325. Renaissance Wit and Humor. Theory and practice of laughter in Renaissance Italy, France, England, and Germany. [3] (Not currently offered)

326. Introduction to Literary Modernism. Some acquaintance with French is virtually prerequisite for the course. [3] (Not currently offered)

327. Theories of Poetic Language. Literary theories in relation to poetry. Theorists such as Rousseau, Schlegel, Heidegger, Derrida, and Kristeva will be studied in relation to poets such as Wordsworth, Poe, Baudelaire, Mallarmé, and Eliot. [3] Franke (French and Italian). (Not currently offered)

330. Seminar in the Enlightenment and Its Literary Connections. FALL. [3] McCarthy.

331. Nouvelle, Novella, Short Story: From Kleist to Maupassant. Focus on the nineteenth century, and in particular on the works of Kleist, Hoffmann, Poe, Mérimée, and Maupassant, with a view to identifying structures common to their narratives. [3] (Not currently offered)

332. Studies in Twentieth-Century Drama. The representation of power and history in drama. Functions of theater in relation to censorship and dogmatism. [3] (Not currently offered)

333. Don Juan: Myth and Ideology. Dramatic structures of the two foundational texts of the Don Juan myth: Tirso's *El Burlador de Seville* and Molière's *Don Juan*. [3] (Not currently offered)

334. The Bourgeois Novel. The role of the bourgeoisie and its social and aesthetic reflection in the dominant literary form of the late nineteenth and early twentieth centuries in England, Europe, and the Americas. Authors typically included: Gustave Flaubert, George Eliot, Henry James, Machado de Assis. [3] Fitz (Spanish and Portuguese). (Not currently offered)

336. Concepts of Realism: The Impact of Marxist Literary Theory. Twentieth-century theories of literary realism, with special emphasis on the development of Marxist theory and practice and its critics. [3] (Not currently offered)

340. Beyond Good and Evil. Emergence of and complexity in literature against the backdrop of Nietzsche's *Beyond Good and Evil* (1886), E. O. Wilson's *Consilience* (1998), P. Cillier's *Complexity and Postmodernism* (1998); "beyond good and evil" as a catch phrase of modern decenteredness in such works as *Notes from Underground*, *Mysterious Stranger*, *The Tin Drum*. [3] McCarthy (Germanic and Slavic Languages). (Not currently offered)

341. Introduction to Literary Theory and Criticism: Classic Texts and Traditions. A broad selection of classic works of literary theory and criticism from antiquity through the nineteenth century will be read in an effort to furnish basic conceptual paradigms and grounding in cultural history for students training to work as literary critics and theorists. Perennial issues revolving around figurative language and narrative representation, the social function of literature, and the tensions between tradition and innovation will be studied in the founding texts of critical theory from Plato and Aristotle, Horace and Quintilian, Augustine and Macrobius, Dante and Boccaccio, Du Bellay and Corneille, Sidney, Dryden and Pope, Kant and Hegel, Schiller and Goethe, Madame de Staël, Coleridge, Wordsworth, and Shelley, Emerson, Poe, Baudelaire, Arnold, Pater, Nietzsche, and Wilde. [3] (Not currently offered)

342. Introduction to Literary Theory and Criticism: From the Nineteenth Century to the Present. Recent and canonical texts of criticism and theory will be compared so as to illustrate the range of purposes and cross-purposes to which contemporary critical discourse is put in relation to literary works and traditions. This will serve as a basic literacy course in

theory, as well as making students conversant with a variety of the most pr ovocative types of critical discourse emerging on the scene today. Currents to be covered include: Formalism and Structuralism, Prostructuralism, New Historicism and Postcolonial Criticism, Marxism and Psychoanalysis, Feminism, Race and Ethnicity Studies, Gay and Lesbian Studies and Queer Theory, Hermeneutics and Phenomenology, Reader-Response, Cultural Studies. [3] Franke, Staff. (Not currently offered)

345. Hermeneutics. Study of the idea of interpretation, including the Bible in the Middle Ages and Homer in Antiquity . Modern philosophical and critical theories; Heidegger , Gadamer, Ricoeur, Fish, Dilthey. [3] Franke. (Not currently offered)

350. Emergences and Application of Literary Theories. Various literary theories throughout history, in various theorists from ancient to modern, and in fictional and poetic works that create or redefine what we call theor y. Course emphasizes diversity in the experience of encountering theory. May be repeated. [3] Staff. (Not currently offered)

351. Comparative Methodology. Comparative Literature as an academic discipline: definition, scholarly and theor etical distinctions, methodologies, applications, r elationship to national literature units and humanities pr ograms. Required of all graduate students in Comparative Literature. [3] Fitz. (Not currently offered)

355. Seminar in Comparative Literatur e. Topics to be announced in the *Schedule of Courses*. [3]

360. Philosophy and Literature. Problems and methodological issues inherent to the study of these two disciplines. [3]

369. Master's Thesis Research. [0]

380. Literary Theory. FALL. [3] Barsky.

385a–385b. Special Problems in Comparative Literature.

390a–390b. Independent Study. [Variable credit: 1–3 each semester]

399. Ph.D. Dissertation Research.

Computer Science

CHAIR Daniel M. Fleetwood
DIRECTOR OF GRADUATE STUDIES Jeremy P. Spinrad
PROFESSORS EMERITI Charlotte F. Fischer, Patrick C. Fischer, William H. Rowan Jr., Horace E. Williams
PROFESSORS Gautam Biswas, Benoit Dawant, Lawrence W. Dowdy, J. Michael Fitzpatrick, Douglas C. Schmidt, Janos Sztipanovits
ASSOCIATE PROFESSORS Douglas H. Fisher, Dario A. Giuse, Gabor Karsai, Stephen R. Schach, Jeremy P. Spinrad
ASSISTANT PROFESSORS Julie A. Adams, Robert Bodenheimer, Yi Cui, Aniruddha Gokhale, T. John Koo, Xenofon Koutsoukos, David Noelle, Yuan Xue
LECTURERS Julie Johnson, Jeanne C. Milostan

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

☙ THE graduate program in computer science is structured around six primary research areas: (1) distributed and networked systems, (2) embedded and hybrid systems, (3) image processing and graphics, (4) intelligent systems, (5) software and systems engineering, and (6) theory. A variety of advanced graduate courses are offered in each of these areas.

Doctoral candidates are required to complete a minimum of 36 hours of formal course work and six hours of independent study. The distribution of courses must include the theory gateway course, and gateway courses in at least three of the other five primary research areas, two additional advanced graduate courses in the student's primary research area, and two more 300-level courses. There is no language requirement.

The master's degree in computer science may be earned through (a) the regular program that includes a thesis or (b) a non-thesis program requiring 30 hours of course work. Under either plan at least 12 hours must be in approved 300-level courses.

The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering.

231. Computer Organization. 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, I/O handling, and assembler concepts. Graduate credit not given for computer science majors. Prerequisite: 201, corequisite: EECE 116. FALL, SPRING. [3] Minsky, Schach.

250. Algorithms. Advanced data structures, systematic study and analysis of important algorithms for searching; sorting; string processing; mathematical, geometric, and graph algorithms; classes of P and NP, NP-complete and intractable problems. Prerequisite: 201 and 212. FALL. [3] Raghavan, Spinrad.

251. Intermediate Software Design. 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: 201. FALL, SPRING. [3]

252. Theory of Automata, Formal Languages, and Computation. Finite-state machines and regular expressions. Context-free grammars and languages. Pushdown automata. Turing machines. Undecidability. The Chomsky hierarchy. Computational complexity. Prerequisite: 212, Discrete Structures. SPRING. [3] Fisher, Raghavan, Spinrad.

253. Image Processing. (Also listed as Electrical Engineering 253) The theory of signals and systems is extended to two dimensions. Coverage includes filtering, 2-DFFTs, edge detection, and image enhancement. Three lectures and one laboratory period. FALL. [4] Dawant, Fitzpatrick.

255. Introduction to Numerical Mathematics. (Also listed as Mathematics 226) Numerical solution of linear and non-linear equations, interpolation and polynomial approximation, 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. Prerequisite: computer programming and linear algebra. FALL, SPRING. [3]

257. Linear Optimization. (Also listed as Mathematics 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: linear algebra and computer programming. SPRING. [3]

258. Introduction to Computer Graphics. Featuring 2D rendering and image-based techniques, 2D and 3D transformations, modeling, 3D rendering, graphics pipeline, ray-tracing, and texture-mapping. Prerequisite: linear algebra, 201, junior standing. FALL. [3] Bodenheimer.

259. Introduction to Computer Animation. Introduction to the principles and techniques of computer animation. Students work in small groups on the design, modeling, animation, and rendering of a small animation project. Topics include storyboarding, camera control, skeletons, inverse kinematics, splines, keyframing, motion capture, dynamic simulation, particle systems, facial animation, and motion perception. Prerequisite: 201, Linear Algebra. SPRING. [3]

260. Artificial Intelligence. Introduction to the principles and programming techniques of artificial intelligence. Strategies for searching; representation of knowledge; automatic deduction, learning, and adaptive systems. Survey of applications. Prerequisite: 250, Algorithms, and 270, Programming Languages, or consent of instructor. FALL. [3] Adams, Biswas, Fisher, Noelle.

265. Introduction to Database Management Systems. Logical and physical organization of databases. Data models and query languages, with emphasis on the relational model and its semantics. Concepts of data independence, security, integrity, concurrency. Prerequisite: 201, Computer Organization. FALL. [3]

269. Project in Artificial Intelligence. 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: 260 or consent of instructor. SPRING. [3] Adams, Biswas, Fisher, Noelle.

270. Programming Languages. General criteria for design, implementation, and evaluation of programming languages. Historical perspective. Syntactic and semantic specification, compilation and interpretation processes. Study of data types and data control, procedures and parameters, sequence control, nesting, scope and storage management, run-time representations. Non-standard languages, problem-solving assignments in a laboratory environment. Prerequisite: 231, Computer Organization. SPRING. [4] Biswas, Fitzpatrick, Milostan.

274. Modeling and Simulation. 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 201, Math 194 or 198, Math 216 or 218. SPRING. [3] Biswas, Koo, Koutsoukos.

276. Compiler Construction. 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: 231, Computer Organization. FALL. [3] Fisher, Milostan.

278. Principles of Software Engineering. 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: 270. FALL. [3]

279. Software Engineering Project. 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: 278. SPRING. [3]

281. Principles of Operating Systems I. Overview of goals of operating systems. Introduction to the resource allocation and control functions of operating systems. Parallel processing and primitives for their synchronization. Use of parallel processes in designing operating system subsystems. Methods for implementation of parallel processes on conventional computers. Introduction of notions of virtual memory, paging, protection of shared and nonshared information. Structures of files of data in secondary storage. Security issues. Case Studies. Prerequisite: 231, Computer Organization. FALL, SPRING. [3] Dowdy, Gokhale, Raghavan, Schmidt.

282. Principles of Operating Systems II. 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. Resources allocation in general, including deadlock detection and prevention strategies. Introduction to operating system performance measurement, for both efficiency and logical correctness. Two hours lecture and one hour laboratory. Prerequisite: 281. SPRING. [3] Dowdy, Gokhale, Raghavan, Schmidt.

283. Computer Networks. Computer communications, network architectures, protocol hierarchies, and the open systems interconnection model. Modeling, analysis, and specification of protocols. Wide area networks and local area networks including rings, buses, and contention networks. Prerequisite: 281. SPRING. [3] Dowdy, Gokhale, Raghavan, Schmidt.

284. Computer-Systems Analysis. Techniques for computer-system performance evaluation with emphasis on applications. Topics include: hardware/software/hybrid measurement and instrumentation techniques, benchmarking, simulation techniques, elementary queuing models, data analysis, operational analysis, performance criteria case studies. Project involving a real computer system. Prerequisite: 281. FALL. [3] Dowdy.

291–292. Special Topics. [Variable credit: 1–3 each semester] (Offered on demand)

310. Design and Analysis of Algorithms. Set-manipulation techniques, divide-and-conquer methods, the greedy method, dynamic programming, algorithms and graphs, backtracking, branch-and-bound, lower bound theory, NP-hard and NP-complete problems, approximation algorithms. Prerequisite: 250, Algorithms. SPRING. [3] Raghavan, Spinrad.

311. Graph Algorithms. Algorithms for dealing with special classes of graphs. Emphasis on subclasses of perfect graphs and graphs that can be stored in a small space. Interval, chordal, permutation, comparability, and circular-arc graphs; graph decomposition. Prerequisite: 310 or Math 273. [3] Spinrad.

312. Computational Learning Theory. An overview of computational learning theory and problems of current interest. Topics include: the PAC model of learning, exact learning with queries, Occam's razor, the Vapnik-Chervonenkis dimension, techniques for proving positive and negative results for learnability, and a study of existing learning algorithms. Prerequisite: consent of instructor. FALL. [3] Raghavan.

315. Automated Verification. 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. FALL. [3]

320. Algorithms for Parallel Computing. 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: 310 or consent of instructor. [3] (Not currently offered)

340. Computational Cognitive Neuroscience. Design and analysis of computational simulations of human behavior and brain function. Information processing accounts of the neural basis of cognition. General connectionist modeling which addresses the biophysics of active membranes, computations performed by individual neurons, activation dynamics produced by recurrent connectivity and lateral inhibition, mechanisms driving synaptic plasticity, and computational role of neurotransmitter systems. Neural network models of perception, attention, learning, memory, language, categorization, and cognitive control. SPRING. [3] Noelle.

343. High-Performance Computing for Engineers. (Also listed as Mechanical Engineering 343) Introduction to high-performance computing. Engineering applications. Focus on high-speed cluster computing. Class project applying high-performance computing to various research topics. SPRING. [3]

350. Artificial Neural Networks. (Also listed as Biomedical Engineering 350 and Electrical Engineering 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] Noelle.

351. Advanced Animation. 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 259 or consent of instructor. FALL. [3] Bodenheimer.

352. Human-Computer Interaction. An overview of human-computer interaction and problems of current interest. Human factors, GOMS, user interface design and evaluation, interaction modalities, distributed cognition, ubiquitous computing. A project involving design and evaluation will be performed. Prerequisite: consent of instructor. FALL. [3] Adams, Bodenheimer.

357. Advanced Image Processing. (Also listed as Electrical Engineering 357) Basic techniques of image processing. Topics include image formation, digitization, linear shift-invariant processing, feature detection, and motion. Prerequisite: 174, Introduction to C or equivalent; Math 175. FALL. [3] Dawant, Fitzpatrick, Peters.

358. Computer Vision. (Also listed as Electrical Engineering 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: 357. SPRING. [3] Staff.

359. Medical Image Registration. 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] Dawant, Fitzpatrick.

360. Advanced Artificial Intelligence. 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: 260 or equivalent. FALL. [3] Adams, Biswas, Fisher, Noelle.

362. Machine Learning. An introduction to machine learning principles of artificial intelligence, stressing learning's role in constraining search by augmenting and/or reorganizing memory. Topics include connectionist systems; concept learning from examples; operator, episode, and plan learning; problem-solving architectures that support learning; conceptual clustering; computer models of scientific discovery; explanation-based learning; and analogical reasoning. Psychological as well as computational interests in learning are encouraged. Prerequisite: 260 or 360 or equivalent. SPRING. [3] Fisher, Noelle.

364. Intelligent Learning Environments. (Also listed as Electrical Engineering 355) Theories and concepts from computer science, artificial intelligence, cognitive science, and education that are important to 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: 260, 360, or equivalent. SPRING. [3] Biswas.

367. Model-Based and Qualitative Reasoning Methodologies. Modeling paradigms covered include structure-behavior models, component connection and compositional modeling, and functional-causal models of physical systems. The spectrum of reasoning and simulation methodologies, from qualitative to quantitative analysis, is discussed. Applications include design of engineering systems, and diagnosis of complex engineering and physiological systems. Prerequisite: 360 or equivalent, or consent of instructor. SPRING. [3] Biswas.

369. Master's Thesis Research. [0]

375. Discrete Event Systems: Supervisory Control and Diagnosis. 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] Koutsoukos.

376. Foundations of Hybrid and Embedded Systems. 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] Biswas, Koo, Koutsoukos.

379. Topics in Embedded Software and Systems. 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] Karsai, Sztipanovits.

381. Advanced Operating-Systems Principles. Techniques for formally analyzing various issues in operating systems. Topics may include: process synchronization, interprocess communication, deadlock, naming, memory management, object capability models, architectural support, protection, fault tolerance. Prerequisite: 281. FALL. [3] Dowdy, Gokhale, Raghavan, Schmidt.

382. Topics in Operating Systems. Prerequisite: 281. [3] (Not currently offered)

384. Performance Evaluation of Computer Systems. Techniques for computer-systems modeling and analysis. Topics covered include: 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: 281 or 381. SPRING. [3] Dowdy.

385. Advanced Software Engineering. 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: 278. SPRING. [3]

386. System-Level Fault Diagnosis. 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: 381 or consent of instructor. [3] Raghavan.

387. Topics in Software Engineering. Topics may include: Software development and maintenance environments. Software metrics. Correctness proofs. ADA as a case study in software engineering. Artificial intelligence aspects of software engineering. Prerequisite: 277 or consent of instructor. SPRING. [3] Gokhale, Karsai, Schach, Schmidt.

388. Model-Integrated Computing. Model-Integrated Computing (MIC) addresses the problems of designing, creating, and evolving information systems by providing rich, domain-specific modeling environments including model analysis and model-based program synthesis tools. Students are required to give a class presentation and prepare a project. FALL [3] Gokhale, Karsai, Sztipanovits.

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

390. Individual Studies. Offered each term. [Variable credit: 1–3]

391–392. Seminar. [Variable credit: 1–3 each semester]

395–396. Special Topics. [3–3]

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Earth and Environmental Sciences

CHAIR David J. Furbish
DIRECTOR OF GRADUATE STUDIES John C. Ayers
PROFESSORS EMERITI Leonard P. Alberstadt, Arthur L. Reesman, William G. Siesser, Richard G. Stearns
PROFESSORS David J. Furbish, Calvin F. Miller, Molly Fritz Miller
ASSOCIATE PROFESSOR John C. Ayers
ASSISTANT PROFESSORS Steven Goodbred, Kaye S. Savage
SENIOR LECTURERS Brendan Bream, Jonathan M. Gilligan
LECTURER N.Kinzly Moore

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*
(option in Environmental Science offered jointly with Environmental Engineering)

A STUDENT earns the master's degree in earth and environmental sciences by completing 24 hours of formal course work and submitting an approved research thesis. Fields of study include sedimentology, geochemistry, Quaternary geology, tectonics, oceanography, igneous and metamorphic petrology, environmental geology, and paleoecology. Graduate students in earth and environmental sciences must obtain permission from the department to receive credit for any course required for the undergraduate major: 220, 225, 226, 230, 240. Graduate students in other disciplines may receive credit for these courses. Six hours of graduate credit is required in another discipline or in an area of earth and environmental sciences other than that in which the student is pursuing thesis research.

220. Life Through Time. Ecology, classification, evolutionary history 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: 101 or junior standing as a biological sciences major. No credit for graduate students in EES. FALL. [4] M. Miller.

225. Earth Materials. 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: 101 or 104. FALL. [4] C.Miller.

226. Petrology. 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: 225. No credit for graduate students in EES. SPRING. [4] Ayers.

230. Sedimentology. 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: 225 or 226. No credit for graduate students in EES. SPRING. [4] Goodbred.

240. Structural Geology and Rock Mechanics. Principles of rock deformation; mechanics, fractures, folds, foliation, primary structures. Field trips. Three lectures and one laboratory period per week. Pre- or corequisite: 226. No credit for graduate students in EES. SPRING. [4] Staff.

257. Hydrogeology. An introduction to hydrogeology with emphasis on distribution, movement, and chemistry of groundwater. Principles of groundwater flow, water chemistry, and geology related to exploration, evaluation, development, and protection of groundwater resources. Prerequisite: 225 and one semester each of chemistry, physics, and calculus. FALL. [3] Savage.

258. Environmental Geochemistry. Concepts, principles and models of chemical processes operating at or near the earth's surface. Thermodynamics, kinetics, organic and isotope geochemistry, environmental mineralogy. Application of concepts to environmental problems. Prerequisite: 225 and Chemistry 102a–102b. FALL. [3] Ayers.

260. Geochemistry. 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: 225 and Chemistry 102a–102b, or consent of instructor. FALL. [3] Ayers.

261. Geomorphology. 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. Prerequisite: 101 and junior standing in natural science, anthropology, or engineering. SPRING. [3] Furbish.

262. Geochemistry Laboratory. Laboratory to accompany 258 or 260. Corequisite: 258 or 260. One three-hour laboratory per week. FALL. [1] Staff.

264. Methods in Environmental Geology. Field, laboratory, and analytical methods in geological and environmental investigations. Chemical and physical principles of analytical instrumentation; analysis and reliability of instrumental measurements. Laboratory and field projects; sample collection; field measurements; chemical/spectroscopic analysis. Prerequisite: junior standing, 225 and previous or concurrent in 257 or 260. SPRING. [3] Savage.

279. Problems in Sedimentology and Paleobiology . Relation between past life and its environment as recorded in sedimentary rocks. Emphasis on reconstructing the depositional environment and the ancient communities recorded in Paleozoic sedimentary sequences in Tennessee, and investigating recent research on the interplay between ecosystems and physical environment during critical periods of earth history. Prerequisite: 220 and 226. FALL. [3] M. Miller.

289a–289b. Directed Study. 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. FALL, SPRING, SUMMER. [Variable credit: 1–2 each semester] Staff.

291a–291b. Independent Study. 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. FALL, SPRING. [Variable credit: 2–3 each semester] Staff.

292a–292b. Senior Honors Resear ch. Independent research under faculty supervision culminating in an oral presentation and written thesis submitted to the faculty. Open only to honors candidates. Does not count towar d minimum r equirements for the major . FALL, SPRING. [Variable credit: 2–3 each semester] Staff.

315. Igneous Petrochemistry and Petrogenesis. Application of phase equilibria and trace element and isotope chemistr y to interpr etation of the origin and histor y of igneous r ocks and to large-scale geological problems to which magma genesis is relevant. Problem solving based upon geochemical data emphasized. Pr erequisite: general chemistry, and analytic geometry and calculus, and GEOL 226, or Chemistry 230. SPRING. [3] C. Miller.

320. Aqueous Geochemistry. The chemistry of subsur face waters, including near -surface groundwaters, oreforming solutions, and metamorphic and igneous fluids. Quantitative analysis of mineral-fluid equilibria using thermodynamics and phase diagrams. Role of aqueous fluids in heat and mass transpor t, chemical r eactions in r ocks, and geochemical cycles. Prerequisite: general chemistry, and GEOL 260 or physical chemistry. FALL. [3] Ayers.

325. Environmental Applications of Geochemical Modeling. Computer-based modeling of geochemical processes. Model types include aqueous speciation and solubility , surface adsorption, reaction paths, inverse mass balance, kinetic and coupled r eactive transport. Application to environmental problems including surface water chemistry, groundwater transport, subsurface waste storage, acid mine drainage, and deep well injection. Prerequisite: 258 or 260. SPRING. [3] (Alternate years) Ayers.

369. Master's Thesis Research.

390. Special Topics and Advanced Techniques in Geology. [Variable credit: 2–4]

East Asian Studies

DIRECTOR Gerald Figal

Affiliated Faculty

RESEARCH PROFESSOR James Auer (Center for U.S.–Japan Studies, VIPPS)
ASSOCIATE PROFESSORS Gerald Figal (History), Yoshikuni Igarashi (History), James J. Lang (Sociology), Ruth Rogaski (History)
ASSISTANT PROFESSOR Tracy Miller (History of Art)
SENIOR LECTURERS Xianmin Liu (Chinese), Peter Lorge (History), Keiko Nakajima (Japanese)
LECTURERS Qing Wei (Chinese), Mine Yoshizawa (Japanese)

A NUMBER of courses are available in East Asian languages, social sciences, and humanities, from which a field of minor concentration may be constructed, subject to approval of the student's adviser.

A partial listing of r elevant courses follows. See departmental listings for courses offered in the current academic year.

The members of the Committee on East Asian Studies ar e James Auer (*Center for U.S.-Japan Studies, VIPPS*), Yoshikuni Igarashi *(History),* James J. Lang (*Sociology*), Xianmin Liu (*Chinese*), Peter Lorge (*History*), Tracy Miller (*History of Art*), and Keiko Nakajima (*Japanese*).

CHINESE: 201–202, Elementary Chinese; 214–216, Intermediate Chinese; 231, Chinese Calligraphy; 241–242, Advanced Chinese; 251–252, Intensive Readings in Chinese.

HISTORY: 248, China in Revolution; 249, History of Modern Japan; 250, Cultural and Social History of Japan's Recent Past; 251, Popular Culture in Early Modern Japan.

HISTORY OF ART: 200, Asian Art; 252, Chinese Art; 253, Japanese Art; 254, Japanese Painting and Prints.

JAPANESE: 201–202, Beginning Modern Japanese; 211–212, Intermediate Modern Japanese; 241–242, Third Year Japanese.

POLITICAL SCIENCE: 214, The Japanese Political System; 216, The Chinese Political System (Not currently offered).

RELIGIOUS STUDIES: 231, Women in Buddhist Traditions; 244, Buddhist Traditions; 249, Zen Buddhism (Not currently offered).

Economics

CHAIR Eric Bond
VICE CHAIR Peter L. Rousseau
DIRECTOR OF GRADUATE STUDIES Gregory Huffman
DIRECTOR OF THE GRADUATE PROGRAM IN ECONOMIC DEVELOPMENT
Andrea Maneschi
PROFESSORS EMERITI Rendig Fels, T. Al Finegan, C. Elton Hinshaw, Cliff J. Huang, Clifford S. Russell, Gian Sabota, Anthony M. Tang, William G. Thweatt, Fred Westfield
PROFESSORS Kathryn H. Anderson, Jeremy Atack, Eric Bond, John Conley, William W. Damon, Andrew F. Daughety, Robert A. Driskill, Benjamin Eden, Yanqin Fan, James E. Foster, Gregory Huffman, Tong Li, Andrea Maneschi, Robert A. Margo, Jennifer F. Reinganum, John J. Siegfried, Quan Wen, John A. Weymark, Myrna Wooders
ASSOCIATE PROFESSORS William J. Collins, Mario Crucini, Malcolm Getz, Kevin X. D. Huang, Peter L. Rousseau, George H. Sweeney
ASSISTANT PROFESSORS Christian Ahlin, Mototsugu Shintani, Diana N. Weymark, Benjamin Zissimos

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

❧ GRADUATE study in economics at Vanderbilt prepares students for research and teaching careers in universities and for planning and leadership positions in government, international agencies, and business. The curriculum emphasizes applications of economic theory. Participation in research projects, in joint seminars, and in informal research workshops assures close student-faculty interaction. Students have been attracted to the program from all parts of the United States and from more than sixty countries. Graduate programs are offered in economics but not in business administration. Students interested in graduate work in business administration should apply to the Owen Graduate School of Management.

A master's degree (without thesis) may be awarded after completion of 42 hours of Ph.D. course work with an average of at least *B* or better.

For the Ph.D. degree, which requires 72 hours, the student normally takes at least 51 hours of formal course work, including required courses in economic history or history of economic thought, statistics, and econometrics, along with courses in microeconomic theory and macroeconomic theory. Economics courses in this catalog numbered below 250 and the business administration courses listed below are available for minor credit in other graduate programs. There is a mathematics requirement, normally satisfied by taking Economics 300, Selected Topics in Mathematics for Economists. There is no foreign language requirement.

The faculty requires that all doctoral students, before undertaking the qualifying examination, pass written examinations in economic theory (micro and macro) and in one major elective field chosen from the following: advanced economic theory, econometrics, economic growth and development, economic history, finance, industrial organization, international economics, labor, money, and public finance. A second field chosen from that list may be completed by either passing a written examination or by passing two courses in this field numbered above 300 with a grade of *B* or better in each course. A second field in which the department offers only one course above 300 or a field requested by petition must be passed by written examination. Each year the department offers a variety of graduate-level courses beyond the core.

All students entering the Ph.D. program are expected to take a competence test in mathematics measuring knowledge of elementary mathematics. It is highly desirable that each entering student have completed one year of calculus and courses in intermediate microeconomic and macroeconomic theory, statistics, and linear algebra.

Detailed information is available on request from the department.

Graduate Program in Economic Development

Students may be interested in the Graduate Program in Economic Development, a more professionally oriented degree program. Students take courses in economic theory and statistics and in such areas as economic development, international trade, and monetary and fiscal policies, and can earn a master of arts degree. This program is described under Special Programs.

Economics

222. Latin American Economic Development. Recent economic growth and structural change of Latin American economies. The general issues of development economics will be explored, such as the mobilization of savings and capital formation, import-substituting industrialization, inflation, agricultural reform, regional and national economic integration, population growth and migration, and balance-of-payments problems. No credit for graduate students in economics. SPRING. [3] Andrade.

231. Intermediate Microeconomic Theory. 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. No credit for graduate students in economics. Prerequisite: one semester of calculus. FALL, SPRING. [3] Conley, Schwartz; Conley, Foster.

232. Intermediate Macroeconomic Theory. National income accounting and analysis. Classical, Keynesian, and contemporary models determining national income, employment, liquidity, price level, and economic growth. No credit for graduate students in economics. Prerequisite: one semester of calculus. FALL, SPRING. [3] Crucini, Weymark; Ahlin, Huffman.

251. Wages, Employment, and Labor Markets. Theories of wages and employment, dual labor markets, internal labor markets, and labor's share of national income. Empirical studies of labor mobility, the effects of unions on relative wages and resource allocation, occupational and industrial wage differentials, and selected labor markets. Prerequisite: 150, Statistics, and 231, or consent of instructor. [3] (Not currently offered)

252. Antitrust Economics. The purposes and effects of antitrust laws in the United States. Economic theory applied to the problems of preserving and enhancing competition. Evaluation of incentives created by judicial precedents in terms of efficiency and performance. Prerequisite: 231. [3] (Offered 2007/2008)

253. Introduction to Econometrics. Quantitative methods of economic analysis. Measurement, specification, estimation, and interpretation of economic models, introduction to econometric computation using microcomputers. No credit for graduate students in economics. Prerequisite: 231 and either 150 or Math 218 and 218L. FALL. [3] Fan.

254. Public Finance. 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: 231 or equivalent. SPRING. [3] Foster.

259. Financial Instruments and Markets. 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: 231, 232. FALL. [3] Kim.

FnEc261. Investment Analysis. Investment principles and practices. Emphasis on security analysis to develop techniques and standards of investment appraisal. Principles of portfolio analysis. The forecasting problem in meeting portfolio needs of individuals and institutions. Special studies to develop capacity for investigating and reporting. Prerequisite: 150 and 240. FALL, SPRING. [3] C. Clark.

262. History of Economic Thought. Evolution of economic ideas from the ancient Greeks to the contemporary world with attention to the seminal thoughts of Adam Smith, David Ricardo, J. S. Mill, Alfred Marshall, and J. M. Keynes. Prerequisite: 231 and 232. SPRING. [3] Maneschi.

263. International Trade. 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. Prerequisite: 231. FALL, SPRING. [3] Driskill; Hutchinson, Ketkar.

264. Open Economy Macroeconomics. Economics of international monetary, financial, and macroeconomic relationships. Effects of monetary and fiscal policies in open economics, balance of payments, exchange rate determination, and international monetary institutions. Prerequisite: 232. FALL, SPRING. [3] D. Weymark.

265. Macroeconomic Models for Policy Analysis. 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: 232. [3] (Offered 2007/2008)

266. Problems in United States Economic History. Analysis of major issues and debates in American economic history. Prerequisite: 231. SPRING. [3] Hutchinson.

267. Economics of Poverty and Discrimination. Develops methodologies used to measure the effectiveness of governmental programs aimed at reducing poverty and discrimination, and uses these methodologies to examine the equity and efficiency of current programs. Topics include social security, food stamps, and equal employment opportunity legislation. Prerequisite: 231 or consent of instructor. [3] (Not currently offered)

268. Economics of Health. An examination of some of the economic aspects of the production, distribution, and organization of health care services, such as measuring output, structure of markets, demand for services, supply of services, pricing of services, cost of care, financing mechanisms, and their impact on the relevant markets. Prerequisite: 231. FALL, SPRING. [3] So.

269a–269b. Selected Topics in Economics. Topics of special interest, as announced in the *Schedule of Courses*. FALL, SPRING. [3] C. Huang, Eden.

270. Economics of Sports. Application of economic principles to professional and collegiate team sports. Theory of sports leagues, demand for sports, the market for athletes, racial discrimination, broadcasting rights, antitrust issues. No credit for both 270 and 280. Prerequisite: 150 and 231. [3] (Not currently offered)

271. Economic History of Europe. The stages of development of capitalism and modern industry in Europe since the decline of feudalism. The interrelation of government policy, financial institutions, scientific discovery, and the spirit of individualism. Prerequisite: 231. [3] (Not currently offered)

273. Game Theory with Economic Applications. 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: 231. FALL. [3] Wooders.

274. Industrial Organization. The structure of contemporary industry and the forces that have shaped it, including manufacturing, trade, and transportation. The role of the large corporation in modern industrial organization. The relation of industrial structure to economic behavior and performance. Prerequisite: 231. FALL. [3] Reinganum.

FnEc 275. Financial Management. (Formerly Business Administration 275) Analysis of cases representing capital budgeting, forecasting cash flow, risk assessment, capital structure, mergers and acquisitions. Seminar. Prerequisite: 240. FALL, SPRING. [3] Damon.

278. The Technical Basis for Environmental Policy. (Also listed as Civil Engineering 278 and Management of Technology 278). The engineering and economic foundations of environmental policy formation, mathematical computer modeling of the environment, and economic valuation of environmental quality. Treatment and site clean-up processes, fundamental equations of environmental engineering, the notion of market failure, and economics of monitoring and enforcement. [3] (Not currently offered)

279. Urban Economics. Urban growth, the development of suburbs, the location of firms, housing markets, transportation, property taxes, and local government services. Prerequisite: 231. SPRING. [3] Getz.

280. Seminar in Sports Economics. Economic theory of sports leagues: competitive balance, player labor markets and owner capital markets. Theories of league expansion, rival leagues, franchise relocation, and sports venues. Research paper. No credit given for both 280 and 270. Preference given to senior majors. Prerequisite: 231. FALL, SPRING. [3] Vrooman.

282. Education and Economic Development. The influence of education on economic growth and development in developing countries. Theory and measurement of economic growth and human capital. Distributional and efficiency effects of human capital policies. Influence of international organizations on human capital development. Education and social cohesion. Prerequisite: 231 and 150 or consent of instructor. SPRING. [3] Anderson.

283. Economics of the Environment. Economic theory and analytic tools involved in selected environmental problems: air and water quality and hazardous waste management. Prerequisite: 231. [3] (Not currently offered)

285. Law and Economics. Analysis of the influence of legal rules and institutions on the behavior of individuals and on economic efficiency and equity. Applications from civil procedure, contract, tort, and criminal law. Prerequisite: 231. SPRING. [3] Daughety.

286. Economics of Human Resources. Human capital theory: economic effect of population trends, fertility, and migration. Additional topics chosen from education, household economics, health, nutrition, demand for children and child care, sex and race discrimination, crime, investment in research and development, the economic value of life and time. Prerequisite: 231 or 233 and 201, Statistics, or consent of instructor. [3] (Not currently offered)

287. European Economic Integration. Policy issues concerning economic integration in Europe, including trade, migration, income distribution, environmental quality, macroeconomic policy, and monetary union. Analysis of European Community institutions. Prerequisite: 231; corequisite: 232. [3] (Not currently offered)

288. Development Economics. 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: 150 and 231. FALL. [3] Ahlin.

300. Selected Topics in Mathematics for Economists. Selected mathematical topics used in the analysis of static and dynamic models. Prerequisite: one year of calculus (Math 171a–171b, Analytic Geometry and Calculus, or equivalent). FALL. [3] Wen.

301. Microeconomic Theory (M.A. Level). The price system in consumer demand and as a mechanism for organizing production, allocating resources, and distributing the national income. FALL. [3] Wen.

302. Macroeconomic Theory (M.A. Level). National income accounting. Theories of income, employment and price determination. Growth and planning models. Monetary theory. SPRING. [3] Driskill.

304a. Microeconomic Theory I. Analysis of resource allocation and relative prices. Behavior of individual economic units and markets. Topics include models of technology, cost and profit and the firm; consumer preferences, constraints and choice; expected utility theory and risk aversion; partial equilibrium under competition and monopoly; partial equilibrium welfare and surplus. FALL. [3] Daughety.

304b. Microeconomic Theory II. Noncooperative game theory, information economics, public goods and an introduction to general equilibrium models. Topics include Nash equilibrium, sequential rationality, incomplete information; oligopoly; bargaining; adverse selection, signaling and screening; principal-agent models; externalities and public goods; introductory general equilibrium and welfare analysis. SPRING. [3] Wooders.

304c. Microeconomic Theory III. General equilibrium, social choice and welfare. General equilibrium, existence, stability and uniqueness results; fundamental theorems of welfare; core and equilibria; general equilibrium with time and uncertainty; social choice theory and mechanism design; axiomatic bargaining and welfare. No credit for students who have completed former 331. FALL. [3] Conley.

305a. Macroeconomic Theory I. Keynesian and neoclassical models of the economy. Introduction to dynamic models. FALL. [3] Huffman.

305b. Macroeconomic Theory II. Neoclassical and new theories of economic growth. Overlapping generations models. SPRING. [3] Eden.

305c. Macroeconomic Theory III. Theories of consumption, investment, demand and supply of money, the labor market. Monetary and fiscal policy. New Keynesian economics. The role of expectations. No credit for students who have completed former 376. SPRING. [3] Crucini.

306. Statistical Analysis (M.A. Level). Interpretation of statistical materials, the principles of statistical inference, the use of available statistics for problems of economic analysis, and the importance of statistics in economic policy and administration. FALL. [3] C. Huang.

307. Statistical Analysis. Statistical methods applicable to quantitative research in economics and business. Distribution theory, statistical inference, and selected multivariate statistical methods. Prerequisite: 201, Statistics, or equivalent. FALL. [3] Shintani.

308. Econometrics (M.A. Level). Empirical measurements with applications to basic economic relations. Specification, estimation of microeconomics and macroeconomics models for the purpose of testing hypotheses, forecasting, and evaluating policy. Prerequisite: 306. SPRING. [3] C. Huang.

309. Econometrics. Analysis of specification errors in single equation estimation of economic relations and introduction to the estimation and application of simultaneous equation models. Prerequisite: 307 or consent of instructor. SPRING. [3] Fan.

312a–312b. Health Economics. Conceptual and empirical analysis of demand for health, medical services, and insurance; decisions by physicians and hospitals about price, quantity, and quality of services; technological change; and structure and performance of the pharmaceutical industry. [3–3] (Not currently offered)

316. International Trade Theory. Classical, neoclassical, and contemporary theories of international trade; empirical evidence for them. Commercial policy, tariffs, the terms of trade and income distribution, international factor movements: economic unions. Trade and growth. Trade and welfare. SPRING. [3] Bond.

317. International Monetary Economics. The balance of payments and the foreign exchange market. Elasticities, absorption, and monetary approaches to the adjustment mechanism. Interest rates and capital flows. Optimal currency areas, internal and external balance. International reserves and liquidity. FALL. [3] Crucini.

320a–320b. Seminar in the Organization and Control of Industry. The structure of American industry; the origins and development of industrial concentration; the behavior and performance of oligopolistic and imperfectly competitive markets; the economics of public utilities. Public policy toward industrial structure and conduct, including antitrust policy, limitation of competition, and direct regulation. FALL, SPRING. [3–3] Daughety, Reinganum.

329a–329b. Labor Economics. Static and dynamic models of labor demand and labor supply and models of human capital development. Applications of the theory to selected topics including: migration, fertility, health, wage determination, education, unionism and industrial relations, employment policies, implicit contracting and layoffs, and discrimination. Examination of methodological problems related to the analysis of labor markets. [3–3] (Not currently offered)

332a. Theory of Money and Finance I. Advanced topics in monetary and financial economics spanning theory and applications. Topics include recently developed dynamic theories of money and asset pricing; inflationary dynamics; money, welfare, and growth; money and business cycles; financial development and growth; credit market imperfections and financial crises. [3] (Offered 2007/2008)

332b. Theory of Money and Finance II. Analyzes microeconomic foundations and general equilibrium models of money and financial markets. Explores such topics as the theory of payments structure, capital asset pricing, rational expectations, efficient markets, contingent-claims markets, and others. Prerequisite: 259. [3] (Offered 2007/2008)

333. Topics in Microeconomics. Advanced theory and applications. May be repeated for credit if there is no duplication of topic. SPRING. [Variable credit: 1–3] Wen.

349a–349b. Reading Course. Designed to permit graduate students to do more intensive study in the area of their special interest than regular course offerings provide. Admission by consent of department chair and supervising professor. [Variable credit: 1–3 each semester]

353. Project Evaluation. Social-benefit cost analysis of investment projects: investment criteria, estimation of benefits and costs, and evaluation of shadow prices and of the social discount rate. The role of national planning. Case studies utilize the experience of developing economies. SPRING. [3] Ketkar.

354a. Public Finance Theory. The social welfare foundations of public finance theory, theories of optimal taxes and public goods treating equity, efficiency, and incentive effects in partial- and general-equilibrium frameworks. Prerequisite: 254 or consent of instructor. [3] (Not currently offered)

354b. Public Finance Seminar. Special topics in applications of public finance theory, including some or all of the following: theories of fiscal federalism, fiscal politics, fiscal policy, externality and pollution, public pricing, social insurance, public income distribution, public debt, cost-benefit analysis, international aspects of public finance, generalized theory of public policy, and issues in tax-expenditure reform. Prerequisite: 354a or consent of instructor. [3] (Not currently offered)

355a–355b. Seminar in Research on Economic Development. How to select and define an economic problem, assemble relevant factual and statistical information, and analyze and interpret it. Students will write a research paper. May not be included in the 24 hours required for the M.A. degree. Completion of both semesters with an average grade of *B* counts in lieu of M.A. thesis. Open only to students in the Economic Development program. 355a, FALL, SPRING; 355b, FALL, SPRING. [3–3] Anderson, Andrade; Huang, Andrade.

357. International Trade and Economic Development. Selected topics concerning the exchange and transfer of goods and resources between less- and more-developed countries. Possible topics include: the international monetary system, the SDR-aid link, dependence and imperialism, the role of trade in economic growth, foreign exchange strategies, and the structure of protection. Primarily designed for students in the Economic Development program. [3] (Not currently offered)

358a–358b. Policy Issues in Developing Economies. Economic analysis of problems in developing countries. 358a: Macroeconomic issues. Topics include monetary policy, financial repression and capital markets, fiscal policy, structural adjustment, inflation, and management of foreign debt. 358b: Microeconomic issues. Topics include public intervention in factor and commodity markets, migration, labor markets and employment, pricing and efficiency in the public sector, urban development and housing, and choices of technology. 358a, FALL. [3–3] Ketkar.

360. Agriculture and Economic Development. Food supply as a national problem; size and characteristics of population; agricultural technology; industrial-urban development and public policies as means of reducing market imperfections and raising output and incomes in rural areas. Case studies of the southern United States and selected underdeveloped countries. [3] (Not currently offered)

364. Economic Fluctuations and Stabilization Policy. The forces governing inflation, total output, and components of GNP, particularly investment decisions: macroeconomic models; short-term business forecasting; monetary, fiscal, and related stabilization policies. [3] (Not currently offered)

366a. Topics in Economic History: Microeconomic. This course will examine various microeconomic aspects of long-term development. Topics may include: the demographic transition, changes in labor force behavior, development of institutions, industrialization, migration, health, measurement of living standards and inequality. Students are expected to become familiar with various large-scale microeconomic databases containing historical information, such as the Integrated Public Use Micro-data Samples of the United States Census. [3] (Not currently offered)

366b: Topics in Economic History: Macroeconomic. This course will examine various macroeconomic aspects of long-term development. Topics may include: economic growth, the development of financial markets and the role of financial markets in economic development, the history and evolution of monetary and fiscal policy, capital market integration, and business cycles, including the Great Depression. Students are expected to become familiar with various macro-history databases (for example, the NBER database). [3] (Not currently offered)

369. Master's Thesis Research. [0–12]

370. Econometric Theory. Identification and estimation of simultaneous equation models. Small sample properties of estimators and Bayesian inference. Model building and testing of economic theory. Prerequisite: 309 or equivalent preparation. FALL. [3] Shintani.

371. An Introduction to Economic History. Economic history in terms of measurement and theory. Factors associated with modern economic growth and institutional change in a variety of countries and time periods. Relation between economic history and history of thought. SPRING. [3] Rousseau.

373. Time Series Econometrics. Estimation of stationary ARMA models, analysis of non-stationary time series models (unit roots and cointegration), introduction to structural time series models and spectral analysis. Models of time-varying conditional variances and models of regime-switching with applications to topics in macroeconomics and finance. Prerequisite: 309. SPRING. [3] Shintani.

374. Nonparametric and Semi-parametric Econometrics. Nonparametric and semi-parametric methods for the estimation and inference in econometric models. Methods include kernel, neural network, orthogonal series, and wavelets. Models include nonparametric models, the partially linear model, index models, and additive models. Prerequisite: 370 or equivalent. SPRING. [3] Fan.

375. Topics in Econometrics. Advanced theory and applications. May be repeated for credit once if there is no duplication. [Variable credit: 1–3] (Not currently offered)

377. Topics in Macroeconomics. Advanced theory and applications. May be repeated for credit once if there is no duplication of topic. FALL. [Variable credit: 1–3] K. Huang.

379. Seminar in Urban Economics. Readings of current research in urban economics. Individual student research projects on topics in locational economics and urban public finance.

Prerequisite: 279. Graduate students may audit 229, Urban Economics, simultaneously . [3] (Not currently offered)

383. Advanced Economics of Natural Resources and the Environment. Detailed analysis of the theoretical and empirical aspects of resource and environmental economics; modeling and empirical analysis of environmental externalities; theory of public investment as applied to natural environments; modeling and empirical analysis of renewable and nonrenewable natural resources. [3] Russell. (Not currently offered)

388a–b. Development and Growth. Contemporary theories and empirical studies of growth and development. Patterns and sources of growth, research and technology transfer, human capital and labor market performance, organization and institutions, inequality and redistributive policy, and welfare costs of inflation. Prerequisite: Econ 304a–b, 305a–b. [3] (Not currently offered)

390. Ph.D. Dissertation Proposal Development. Prerequisite: permission of director of graduate studies. FALL, SPRING. [0–3]

398. Workshop on Economics. Research seminar to aid advanced students in the selection of thesis topics and presentation of research papers. Topics covered depend on interests of students and faculty. FALL, SPRING. [0–3] Li, Rousseau.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Electrical Engineering

CHAIR Daniel M. Fleetwood
DIRECTOR OF GRADUATE STUDIES Benoit M. Dawant
PROFESSORS EMERITI Arthur J. Brodersen, James A. Cadzow, L. Ensign Johnson, Francis M. Wells, Edward J. White
PROFESSORS A. B. Bonds, George E. Cook, Jimmy L. Davidson, Benoit M. Dawant, Daniel M. Fleetwood, Kenneth F. Galloway, Dennis G. Hall, Weng Poo Kang, Kazuhiko Kawamura, Lloyd W. Massengill, Ronald D. Schrimpf, Richard G. Shiavi, Janos Sztipanovits, Robert A. Weller
ASSOCIATE PROFESSORS Bharat L. Bhuva, Gábor Karsai, Richard Alan Peters II, D. Mitchell Wilkes
RESEARCH ASSOCIATE PROFESSOR Michael L. Alles
ASSISTANT PROFESSORS T. John Koo, William H. Robinson

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

PROGRAMS in electrical engineering are offered in the areas of analog and digital circuits, computer engineering, intelligent systems, solid state devices, signal processing and analysis, robotics, microelectronics, and related areas in biomedical engineering.

The master of science degree program requires 24 credit hours, including 18 hours in the major area (within EECE) and 6 hours in a minor area. At

least 12 hours in the major area must be taken at or above the 300 level. The courses taken must also include one of the gateway courses in each of two of the following areas: electronics, computer, and signals and systems. Gateway courses are graduate-level courses with senior-level prerequisite, the list of which is maintained by the DGS. The remainder of the course work in the major must be taken at or above the 250 level. The minor will be six hours of graduate-level course work, typically outside of EECE. A maximum of 3 hours of independent study may be applied to the 18 hours required in the major area. The student's adviser must approve all courses. A research thesis is required. A non-thesis option is also offered, which requires an additional 6 hours of independent study constituting one single unit of research work.

A total of 72 hours is required for the Ph.D. degree. At least 36 of these hours must be course work, with at least 24 of the 36 hours in EECE. In addition to the 36 hours, an additional 12 hours must be either course work or independent study in EECE, as specified by the candidate's committee. Up to 24 credit hours taken as part of the master's degree program may be applied to the 72-hour total with the approval of the committee. At least 12 hours of coordinated study must be in a minor subject, typically outside the EECE program. The 6 minor hours taken as part of the master's degree may be applied toward the 12-hour requirement, and the 6 additional minor hours must be taken at or above the 250 level. Up to 12 total hours of course work numbered at or below 299 may be applied toward the 72-hour total, including hours taken at this level as part of the master's degree program and hours taken to fulfill the minor requirement (note that no course work in the major area may be numbered below 250). CS courses in the student's area of research can also be taken for EECE graduate program credit with written approval of the student's adviser. The remaining 24 hours may be in dissertation research hours, special readings, or transfer credit (if applicable). The candidate must complete at least 24 hours of formal course work while in residence at Vanderbilt. The candidate's adviser must approve all courses.

Specific and current degree requirements (including course selection, committee selection, preliminary examination, thesis/dissertation, and dissertation defense policies) are detailed in the Graduate Policy Document. A copy of this document should be obtained from the program office.

The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering.

218. Microcontrollers. 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 input/output with 8-bit microcontrollers, control algorithms, and networking with microcontrollers. Three lectures and one laboratory. No graduate credit for electrical engineering students. Prerequisite: EECE 116, CS 101. SPRING. [4] Karsai.

233. Electromagnetics. Introduction to electromagnetic field theory. Maxwell's equations are developed from the historical approach. Electromagnetic waves are discussed with regard to various media and boundary conditions. No graduate credit for electrical engineering students. Prerequisite: Physics 117b, Math 229. FALL. [3] Fleetwood.

235. Electronic Circuits I. Introduction to semiconductor devices and electr onic 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 cir cuits. No graduate credit for electrical engineering students. Thr ee lectures and one laborator y period. Pr erequisite: 213, 216. FALL. [4] Kang.

252. Signal Processing and Communications. AM and FM modulation. Also, advanced topics in signal processing are treated. Prerequisite: 214. [3] Wilkes.

253. Image Processing. (Also listed as Computer Science 253) The theor y of signals and systems is extended to two dimensions. Coverage includes filtering, 2-DFFTs, edge detection, and image enhancement. Three lectures and one laboratory period. FALL. [4]

254. Computer Vision. Vision is presented as a computational problem. Coverage includes theories of vision, inverse optics, image representation, and solutions to ill-posed problems. Prerequisite: 253. [3] Peters.

256. Digital Signal Pr ocessing. Applications of Digital Signal Pr ocessing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laborator y period. Prerequisite: 214. [4] Wilkes.

257. Control Systems I. Introduction to the theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Cr edit given for only one of ECE 257 and ME 257. Prerequisite: 213. FALL. [3] Koo.

258. Control Systems II. Fundamental concepts of system theor y. Model representation. Linear vector spaces and their use in system analysis. Intr oduction to nonlinear systems and optimum control theory. Prerequisite: 257. SPRING. [3] Kawamura.

263. Signal Measurement and Analysis. (Also listed as Biomedical Engineering 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. Prerequisite: 214. FALL. [3] Shiavi.

264. Electromechanical Energy Conversion I. Theory and design of inductors, transformers, linear actuators, and simple motors. Pr erequisite: 213, Math 299. Cor equisite: 233. FALL. [4] Wells. (Offered in even numbered years)

265. Electromechanical Energy Conversion II. Theory and design of r otating machines. Dynamics and control of rotating machines. Prerequisite: 264, 257. SPRING. [4] W ells. (Offered in odd numbered years)

266. Power Electronics. Introduction to solid-state power electronics. Rectifiers, semiconductor switches, AC voltage controllers, controlled rectifiers, choppers, and inverters are studied. Three lectures and one laboratory. Prerequisite: 213, 235; Math 229. SPRING. [4] Wells.

267. Power System Analysis I. Analysis of large transmission and distribution networks. Analysis of power lines, load flow , short circuit studies, economic operation, and stability are introduced. Prerequisite: 213. FALL. [3] Wells. (Offered in odd numbered years)

268. Power System Analysis II. Continued study of load flow , short circuit analysis, economic operation, and stability of power systems. Intr oduction to protection fundamentals. Prerequisite: 267. SPRING. [3] Wells. (Offered in even numbered years)

269. Electrical Energy Pr oduction. The production of electrical ener gy by conversion methods, little used today, which will become important as traditional sources of energy are

depleted. Emphasis is on conservation, storage, efficiency, and direct energy conversion. Prerequisite: 213, Math 229. No credit for both 269 and ME 265. [3] (Not currently offered)

271. Introduction to Robotics. (Also listed as Mechanical Engineering 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. Math 230 (or equivalent) and ME 141 (or equivalent) recommended. FALL. [3] Cook.

272. Advanced Software Architectures. Tools and techniques for designing complex software systems. Programming language idioms, design patterns, and high-level architecture of systems. Overview of reactive systems, client-server architectures, distributed object systems, object database systems, and design methods for the above. Lectures and seminars. An intensive team-oriented project experience is included. Prerequisite: CS 201, knowledge of C++ language. SPRING. [3] Karsai, Ledeczi.

273. Parallel Systems. Design of hardware and software components of configurable parallel systems with emphasis on real-time, embedded applications. Survey of current design trends and approaches, hardware and software tools for parallel systems, and analysis of state-of-the-art parallel processors. Hands-on project experience using configurable parallel configurations. Prerequisite: 279. FALL. [3] Staff.

276. Embedded Systems. Advanced course on the design and application of embedded microcontroller-based systems. Architectures and capabilities of advanced microcontrollers. Embedded system modeling, design and implementation using real-time and event-driven techniques. A structured project is required. Intended for seniors. Prerequisite: 218. Corequisite: 276L. FALL [3]. Karsai.

276L. Embedded Systems Laboratory. Laboratory for EECE 276. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: 276. FALL [1].

277. FPGA Design. Design and applications of field-programmable gate arrays, CAD tools for design, placement, and routing. Practical experience is gained by implementing various designs on prototype FPGA board. A project is required. Prerequisite: 116 or consent of instructor. SPRING. [3] Bhuva.

280. Electronics II. 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: 235. SPRING. [3] Massengill.

283. Principles and Models of Semiconductor Devices. 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: 235 or consent of instructor. SPRING. [3] Kang.

284. Integrated Circuit Technology and Fabrication. Introduction to monolithic integrated circuit technology. Understanding of basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Elements of fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. Prerequisite: 235 or consent of instructor. SPRING. [3] Davidson.

285. VLSI Design. 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 pr oject. Prerequisite: 216, 235, or consent of instructor. FALL. [3] Bhuva.

287. Engineering Reliability. Topics in engineering r eliability with emphasis on electrical systems. Reliability concepts and models. Risk analysis. System examples. Pr erequisite: senior standing. FALL. [3] Johnson.

291–292. Special Topics. [Variable credit: 1–3 each semester] (Offered on demand)

301. Introduction to Solid State Materials. The properties of charged particles under the influence of an electric field, quantum mechanics, par ticle statistics, fundamental par ticle transport, and band theory of solids will be studied. FALL. [3] Weller.

302. Electric and Magnetic Pr operties of Solids. A review of electr omagnetic 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: 301 or equivalent. SPRING. [3] Weller.

304. Radiation Effects and Reliability of Micr oelectronics. An overview of 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 ef fects. Effects of defects and impurities on MOS long-ter m reliability. SPRING. [3] Fleetwood.

305. Topics in Applied Magnetics. Selected topics in magnetism, magnetic pr operties of crystalline and noncrystalline materials; ferrite materials for electronics and microwave applications, resonance phenomena. Prerequisite: 302 or consent of instructor . [3] (Offered on demand)

306. Solid-State Effects and Devices I. The semiconductor equations ar e examined and utilized to explain basic principles of operation of various state-of-the-ar t semiconductor devices including bipolar and MOSFET devices. SPRING. [3] Schrimpf.

307. Solid State Ef fects and Devices II. The structure of solids, phonons, band theor y, scattering phenomena, and theory of insulators. [3] Schrimpf.

311. Systems Theory. Analysis and design of multivariable contr ol systems using state space methods. Stability, controllability, and obser vability treated. Controllers designed using pole placement, optimal linear regulator, and the method of decoupling. State reconstruction via observers. SPRING. [3] Peters. (Offered in even numbered years)

331. Robot Manipulators. (Also listed as Mechanical Engineering 331) Dynamics and control of robot manipulators. Includes material on Jacobian matrix r elating velocities and static forces, linear and angular acceleration r elationships, manipulator dynamics, manipulator mechanism design, linear and nonlinear control, and force control of manipulators. Prerequisite: 271 (or equivalent). SPRING. [3] Cook.

341. Advanced Analog Electronics. Analysis and design of analog electronic circuits with emphasis on integrated cir cuits. Operational amplifiers, wideband amplifiers, multipliers, and phaselocked loops. FALL. [3] Massengill.

342. Advanced Digital Electr onics. Analysis and design of digital electr onic circuits with emphasis on integrated cir cuits. Logic families, semiconductor memories, and the analog-digital interface. SPRING. [3] Staff.

343. Digital Systems Ar chitecture. Architectural descriptions of various CPU designs, storage systems, IO systems, parallel and V onNeumann processors and inter connection networks will be studied. [3] (Offered on demand)

350. Artificial Neural Networks. (Also listed as Biomedical Engineering 350 and Computer Science 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] Noelle.

351. The Visual System. (Also listed as Cell and Developmental Biology 347, Neuroscience 347, Psychology 336) An interdisciplinary approach to how humans see and interpret their visual environment. Topics include the structure of the eye and brain (including optics), the physiology of individual cells and groups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week in addition to lecture, and turn in a more extensive paper than undergraduates. SPRING. [3] Casagrande (Cell and Developmental Biology), Bonds.

354. Advanced Real Time Systems. Covers hybrid architectures for combining symbolic and nonsymbolic programming for real-time systems; parallel architectures and programming methods for symbolic programming of dataflow systems, connection machines, actor systems; literature reviews and projects. SPRING. [3] Karsai.

355. Intelligent Learning Environments. (Also listed as Computer Science 364) Theories and concepts from computer science, artificial intelligence, cognitive science, and education that are important to 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 260, CS 360, or equivalent. SPRING. [3] Biswas.

356. Intelligent Systems and Robotics. Concepts of intelligent systems, AI robotics, and machine intelligence using research books and papers. Emphasis on how AI, brain research, soft computing, and 3D simulations are advancing robotics. Class projects. SPRING. [3] Kawamura.

357. Advanced Image Processing. (Also listed as Computer Science 357) Basic techniques of image processing. Topics include image formation, digitization, linear shift-invariant processing, feature detection, and motion. Prerequisite: Math 222; some C programming. FALL. [3] Dawant.

358. Computer Vision. (Also listed as Computer Science 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: 357 or Computer Science 357. SPRING. [3] (Offered in odd numbered years)

361. Random Processes. An introduction to the concepts of random variables, functions of random variables and random processes. Study of the spectral properties of random processes and of the response of linear systems to random inputs. Introduction to linear mean square estimation. The emphasis is on engineering applications. FALL. [3] Wilkes.

362. Detection and Estimation Theory. Fundamental aspects of signal detection and estimation. Formulation of maximum likelihood, maximum a posteriori, and other criteria. Multidimensional probability theory, signal and noise problems, and Kalman filter structure are studied. SPRING. [3] Cadzow.

365. Biomedical Pattern Recognition. (Also listed as Biomedical Engineering 365) General problems of pattern recognition with applications to biomedical signals and images. Topics

such as feature extraction, cluster analysis, discriminant analysis, statistical decision functions, and machine learning will be introduced. Prerequisite: 263 or equivalent. FALL. [3] Shiavi.

369. Master's Thesis Research.

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

391–392. Seminar. [1–1]

393–394. Advanced Seminar for Ph.D. Candidates. [1–1]

395–396. Special Topics. Based on research and current developments in electrical engineering of special interest to staff and students. [3–3]

397–398. Independent Study. 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]

399. Ph.D. Dissertation Research.

English

ACTING CHAIR Leah S. Marcus
DIRECTOR OF GRADUATE STUDIES Lynn E. Enterline
DIRECTOR OF CREATIVE WRITING PROGRAM Mark Jarman
PROFESSORS EMERITI Paul Elledge, R. Chris Hassel Jr., Walter L. Sullivan, Harold Lerow Weatherby Jr.
PROFESSORS Houston Baker, Vereen M. Bell, Jay Clayton, Colin (Joan) Dayan, Carolyn Dever, Lynn E. Enterline, Sam B. Girgus, Roy K. Gottfried, John Halperin, Mark Jarman, Michael Kreyling, Vera Kutzinski, Jonathan Lamb, Leah S. Marcus, Dana Nelson, John F. Plummer III, Hortense Spillers, Cecelia Tichi
ASSOCIATE PROFESSORS Tina Chen, Kate Daniels, Tony Earley, Teresa A. Goddu, Dennis D. Kezar Jr., Ifeoma Nwankwo, Bridget Orr, Mark Schoenfield, Kathryn Schwarz, Mark A. Wollaeger
ASSISTANT PROFESSORS Sean X. Goudie, Jaya Kasibhatla, Lorraine Lopez, Nancy Reisman, Shawn Salvant, Paul Young
WRITER IN RESIDENCE Alice Randall
VISITING WRITER IN RESIDENCE Peter Guralnick

DEGREES OFFERED: *Master of Arts, Master of Arts in Teaching, Master of Fine Arts, Doctor of Philosophy*

❧ THE graduate program in English offers course work and research supervision in all areas of British and American literature, Anglophone literature from other countries, film, cultural studies, and literary theory. The goal of the Ph.D. program is to produce scholars, critics, and teachers of literature and culture for colleges and universities.

Applicants must submit scores on the General Test of the Graduate Record Examination.

Requirements for the master's degree include 24 hours of course work and a thesis at the end of the M.A. year.

Requirements for the M.F.A. include 42 to 48 hours of course work, a thesis of creative work (a novel, a book of short stories, a collection of poems, or a collection of personal essays), plus an oral defense of the thesis.

Requirements for the Ph.D. include at least 52 hours of course work; Ph.D.–level proficiency in a foreign language; comprehensive examinations; and a dissertation.

Other regulations governing graduate work are available from the director of graduate studies. For more information on the M.F.A., see the Academic Programs chapter of this catalog.

Graduate seminars in English (301 through 325, 330, 350, and 355) may be taken four times for a maximum of 16 credit hours so long as topics are not duplicated.

301. Seminar in Middle English Literature. [4] (Not currently offered)

302. Seminar in Chaucer. SPRING. [4] Plummer.

303. Graduate Fiction Workshop. [May be repeated for credit if there is no duplication of topic] FALL, SPRING. [4] Lopez, Reisman.

304. Graduate Poetry Workshop. [May be repeated for credit if there is no duplication of topic] FALL, SPRING. [4] Daniels, Jarman.

305. Graduate Nonfiction Workshop. [May be repeated for credit if there is no duplication of topic] SPRING. [4] Earley, Guralnick.

306. Seminar in Sixteenth-Century Literature. [4] (Not currently offered)

307. Literature and the Craft of Writing. [May be repeated for credit if there is no duplication of topic] [4] (Not currently offered)

310. Seminar in Shakespeare. [4] (Not currently offered)

312. Seminar in Seventeenth-Century Literature. FALL. [4] Marcus.

314. Seminar, 1660–1800. SPRING. [4] Orr.

316. Seminar in Romantic Prose and Poetry. SPRING. [4] Schoenfield.

318. Seminar in Victorian Prose and Poetry. SPRING. [4] Bigelow.

320. Studies in American Literature. FALL, SPRING. [4] Goddu, Kutzinski, Luis, Nelson.

321. Studies in Southern Literature. [4] (Not currently offered)

325. Seminar in Modern British and American Literature. FALL. [4] Gottfried.

326. Introduction to Literary Modernism. (Also listed as Comparative Literature 326) [4] (Not currently offered)

330. Seminar in the Enlightenment and Its Literary Connections. [4] (Not currently offered)

337a. Introduction to Literary Theory. FALL. [4] Enterline.

337b. Introduction to Literary Theory. FALL. [4] Lamb.

350. Special Problems in English and American Literature. May be repeated. [Variable credit: 1–4]

355. Special Topics in English and American Literature. FALL, SPRING. [4] Dayan, Wollaeger, Young.

369. Master's Thesis Research.

370. Master of Fine Arts Thesis Research. SPRING. [8] Staff.

371. Teaching Composition and Literature. A five-year professional development program intended to prepare students to teach English at the college level. Required of and limited to graduate students on appointment in the English department. [3] (Not currently offered)

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Environmental Engineering

CHAIR David S. Kosson
DIRECTOR OF GRADUATE STUDIES James H. Clarke
PROFESSORS EMERITI W. Wesley Eckenfelder, John A. Roth, Richard E. Speece, Edward L. Thackston
PROFESSORS Mark D. Abkowitz, P. K. Basu, David J. Furbish, David M. Hercules, David S. Kosson, Sankaran Mahadevan, Frank L. Parker, Karl B. Schnelle Jr.
PROFESSORS OF THE PRACTICE James H. Clarke, Sanjiv Gokhale
ASSOCIATE PROFESSORS John C. Ayers, Alan R. Bowers, Eugene J. LeBoeuf
ASSISTANT PROFESSORS Caglar Oskay, Harold S. Park, Florence Sanchez, Kaye Savage, Luoyu R. Xu
RESEARCH ASSISTANT PROFESSORS Edsel B. Daniel, James P. Dobbins, Andrew C. Garrabrants, Leslie M. Shor

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

☙ THE master's degree in environmental engineering may be earned through (a) the regular program that includes 24 hours of class work plus a thesis or (b) a non-thesis program requiring 30 hours of class work. There are 18 hours of required course work plus an additional 3 hours required for the non-thesis program. Remaining course work consists of elective courses.

The Ph.D. program requires all of the courses required for the non-thesis master's degree plus an additional 3-hour math requirement and 6 hours of electives related to the dissertation topic as approved by the dissertation committee. A minimum of 39 hours of formal course work and a dissertation are required. In addition, all Ph.D. candidates must pass a comprehensive exam after completing the 18-hour core curriculum. No foreign language is required.

The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering.

Civil Engineering

252a–252b. Civil and Environmental Engineering Seminar. A two-part seminar series designed to introduce students to current technical and professional issues through literature discussions, seminars by faculty and practicing engineers, and participation in panel discussions. FALL, SPRING. [1–1]

259. Geographic Information Systems. Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and Internet delivery. GIS software utilization and individual projects. SPRING. [3]

286. Construction Project Management. Introduction to the theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Broad 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. Prerequisite: CE 235 or consent of instructor. FALL. [3]

287. Construction Estimation. Fundamentals of construction estimating. Estimation of material, labor, and equipment quantities, including costing and pricing of projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: CE 286. FALL. [3] Gokhale.

288. Construction Planning. 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 preconstruction through operation and maintenance. Use of real-world examples and project scheduling software. Prerequisite: CE 286 and CE 287. SPRING. [3] Gokhale.

290. Reliability and Risk Case Studies. Review of case studies involving successes and failures in managing reliability and risk assessment of engineering systems from a wide range of perspectives, including design, production, operations, organizational culture, human factors, and exogenous events. Analysis of event consequences in terms of public health and safety, the environment and business continuity, and the implications on regulation, legal liability, and business practices. Evaluation of 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 or consent of instructor. FALL. [3] Abkowitz.

307. Finite Element Analysis. 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. One-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. Finite element formulation of two-dimensional problems (single and multi-field)—mapping and shape functions, triangular and quad elements with straight or curved boundaries. Application problems in 1-D, 2-D, and 3-D. Three-D elements, singular problems, and elements of buckling and nonlinear problems. Error estimation and quality control. Computer implementation. Commercial packages. FALL. [3]

310. Probabilistic Methods in Engineering Design. (Also listed as MT 312) 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 r egression and correlation analyses, Monte Carlo simulation, reliability analysis and reliability-based design. FALL. [3]

311. Engineering Design Optimization. Methods for optimal design of engineering systems. Optimization under uncer tainty, reliability-based design optimization, r obust design, multidisciplinary problems, multi-objective optimization. Discr ete and continuous design variables, advanced numerical algorithms, and for mulations and strategies for computational efficiency. Practical applications and term projects in the student's area of interest. Prerequisite: Math 287, Math 288 or CS 257, CE 310. [3] (Offered on demand)

313. Advanced Reliability Methods. Computational methods for probabilistic analysis and design of modern engineering systems. Emphasis on system r eliability, nonlinear reliability methods, Weibull analysis, Bayesian methods, r esponse surface modeling and design of experiments, advanced simulation and variance r eduction concepts, sensitivity analysis and reliability-based design optimization. Practical applications using existing softwar e. SPRING. [3]

359. Emerging Information Systems Applications. (Also listed as MT 359) An intr oduction to emerging information systems technologies and their role in improving productivity and efficiency 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. FALL. [3]

371a–371b. Reliability and Risk Engineering Seminar . Seminars by expert speakers will 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 aer ospace systems; network systems (power distribution, water and sewage systems, transportation, etc.); manufacturing and construction; and electronic and software systems. FALL, SPRING. [1–1]

Environmental Engineering

260. Solid and Hazar dous Waste Management. Solid municipal and hazar dous waste management including generation, characterization, collection, tr eatment, and disposal. Legal requirements, risk assessment and management, costs and policy considerations; pollution prevention, recycling, and substitution. [3] (Offered on demand)

262. Hydrology. 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 203, CE 277. FALL. [3]

264. Environmental Assessments. Design and conduct of environmental assessments to evaluate risks posed by infrastructur e systems or envir onmental contamination. Impact analyses for sources, infrastructure modifications, due diligence environmental audits, and contaminated site remedial investigations. FALL. [3]

269. Radiological Aspects of Envir onmental Engineering. Characterization and detection of environmental radiation; biological effects of radiation; hazards, control, and disposal of radioactive wastes; use of radioactive tracers in environmental studies. SPRING of alternate years. [3]

270. Environmental Thermodynamics, Kinetics, and Mass Transfer. Examination of fundamental environmental processes and phenomena which provide the analytical tools necessary to solve a broad range of environmental problems. These tools include equilibrium phenomena, process rate and mass transport phenomena. FALL. [3]

271. Environmental Chemistry. 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. FALL. [3]

272. Biological Unit Processes. 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]

273. Environmental Characterization and Analysis. Introduction to the 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 is gained in combination with demonstrations featuring state-of-the-art analytical instrumentation. SPRING. [3]

274. Surface Water Quality Modeling. Physical, chemical, biological, and physiological processes in streams, lakes, estuaries, and surface water/groundwater interfaces. Analytical and numerical modeling techniques. One- and two-dimension computer simulation of surface water quality. Prerequisite: 270 or equivalent. SPRING. [3]

276. Ground Water Hydrology. 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. Students cannot receive credit for both ENVE 276 and Earth and Environmental Sciences 257. SPRING. [3]

277. Physical/Chemical Unit Processes. Principles of mass transfer, chemistry, and chemical reactor technology applied to the design and operation of water and wastewater treatment processes. Unit processes such as coagulation/flocculation, sedimentation, filtration, carbon adsorption, ion exchange, air stripping, precipitation, chemical oxidation, and chemical reduction will be evaluated as alternatives for the treatment of drinking water and industrial wastewaters. SPRING. [3]

280. Atmospheric Pollution. Fundamentals of atmospheric pollution and control. The sources and nature of gaseous and particulate air pollutants, the relation of meteorological conditions to their dispersal, and their effects on health and materials are discussed along with administration, standards, and control of air pollution. SPRING. [3]

296. Safety, Security, and Environmental Risk Management. Development of safety and security programs 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 or consent of instructor. SPRING. [3]

312. Pollutant Transport in the Environment. An introduction to the mathematical foundations of fluid mechanics and transport of pollutants in the environment. Fundamental conservation of mass, momentum, and energy equations will be developed. Appr opriate initial and boundary conditions and solution techniques will be discussed for a number of applications. [3]

325a–325b–325c. Individual Study. Literature review and analysis, or laboratory investigation, of special pr oblems under faculty super vision. FALL, SPRING, SUMMER. [V ariable credit: 1–4 each semester]

369. Master's Thesis Research.

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

399. Ph.D. Dissertation Research.

Environmental Management

THE Environmental Management Program offers guidance and support for the interdisciplinary study of environmental business, policy, law, engineering, and technology issues. The V anderbilt Center for Envir onmental Management Studies brings faculty members and students together fr om various disciplines for collaborative study and r esearch on topics such as environmental risk assessment; management and communication; organizational design and strategy; sustainability; policy analysis; envir onmentally conscious manufacturing and technology management; and global environmental issues.

Participating faculty include Mark D. Abkowitz (*Civil and Environmental Engineering*), James H. Clarke (*Civil and Envir onmental Engineering*), Mark A. Cohen (*Management*), David S. Kosson (*Civil and Envir onmental Engineering*), Frank L. Parker (*Civil and Envir onmental Engineering*), and Michael P. Vandenbergh (*Law*).

There are several options for students interested in pursuing the master's or Ph.D. degree in environmental management and r elated areas. For further details, contact Pr ofessor Cohen at *mark.cohen@owen.vanderbilt.edu* or Professor Clarke at *james.h.clarke@vanderbilt.edu* and visit the VCEMS W eb site at *www.vanderbilt.edu/VCEMS*.

French and Italian

CHAIR Virginia M. Scott
DIRECTOR OF GRADUATE STUDIES Robert Barsky
PROFESSORS EMERITI Barbara C. Bowen, Dan M. Church, Larry S. Crist, James Patty, Ruth G. Zibart
PROFESSORS Robert Barsky, Marc Froment-Meurice, Tracy Sharpley-Whiting, Patricia A. Ward
ASSOCIATE PROFESSORS William Franke, Anthère Nzabatsinda, Lynn Ramey, Virginia M. Scott, Holly A. Tucker
ASSISTANT PROFESSOR Nathalie Debrauwere-Miller
SENIOR LECTURERS Patricia Armstrong, Tracy Barrett, Susan Kevra, Martine Prieto, Mary Beth Raycraft, Nathalie Dieu-Porter

DEGREES OFFERED: FRENCH. *Master of Arts, Doctor of Philosophy*

❧ REQUIREMENTS for the master's degree include 36 hours of course work, all of which may be taken in the Department of French and Italian. French 300 and 310 are required as part of the 36 hours. Courses may be taken outside the department or a minor may be completed with the approval of the director of graduate studies. There is no thesis. A comprehensive examination, based on a departmental reading list, must be taken no later than the second week of the student's fourth semester of study.

Requirements for the Ph.D. include at least 51 hours of course work, including 14 courses in French at the 300-level, of which six must be literature seminars distributed among six different time periods. Students are expected to begin to register for research credit no later than their fifth semester of study. Up to 21 hours may be taken as research credit. Of the required 51 hours of course work, 9 hours will be taken in a minor field. An integrated minor of twelve hours outside the department is required for students writing dissertations in the field of second language acquisition. Students are required to take French 300 and 310 during their first year of study. During the second or third year of study, they must take one course in each of the following categories:

Language/Linguistics: French 302 (required for any student specializing in medieval or Renaissance literature), French 318 (required for any student specializing in second language acquisition), or French 320.

Literary Theory and Criticism: French 380 or an equivalent course outside the department, by permission of the director of graduate studies.

In addition to French and English, doctoral candidates must demonstrate a reading knowledge of a foreign language appropriate to the area of specialization. However, it is strongly recommended that students have a reading knowledge of both Latin and German. Other regulations governing graduate work are available from the director of graduate studies.

The Jean and Alexander Heard Library's rich collection of French materials makes research possible in all periods of French literature. The library's

special collections department also houses the W. T. Bandy Center for Baudelaire and Modern French Studies, the Pascal Pia collection (nineteenth- and twentieth-century literary criticism), the Gilbert Sigaux collection (twentieth-century French theatre), and the Wachs collection (eighteenth-century fiction and almanacs).

French

101G. French for Reading. Survey of grammar and vocabulary, with extensive reading. Available to graduate students for "no credit" only. SPRING. [0] Kevra.

203. Phonetics. Methodical comparison of French and English sounds. Correct formation of French sounds; oral exercises and aural training. FALL, SPRING. [3] Prieto.

207–208. French Civilization. Cultural achievements of France within a historical and geographic context. 207: from the origins to the revolution. 208: nineteenth and twentieth centuries, Napoleon to DeGaulle. 207: FALL; 208: SPRING. [3–3] Ward, Raycraft.

214. Advanced Conversational French. Emphasis on idiomatic usage and strategies for oral communication. Prerequisite: 201. FALL, SPRING. [3] Porter.

222. Introduction to Francophone Literature. 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, Indian Ocean, and Vietnam. FALL. [3] Nzabatsinda.

226. Advanced French Grammar. A systematic review with particular attention to morphology and syntax. Prerequisite: 201 or its equivalent. FALL. [3] Prieto.

232. The *Querelles des femmes*. Debates around the status of medieval and Renaissance women, including the *Roman de la rose*. Alain Chartier, Christine de Pisan, the Des Roches, Montaigne, and Marie de Gourney. [3] (Not currently offered)

234. Medieval French Literature. Thematic exploration of chronicles, romance, poetry, and theater of medieval France and the history and culture that surrounded these literary productions. [3] (Offered 2007/2008)

237. The Early Modern Novel. Development of the novel as a genre in the seventeenth and eighteenth centuries; its changing social, intellectual, and political context. [3] (Not currently offered)

238. The Twentieth-Century Novel. The novel as a genre in the context of modernity and post modernity. Readings will focus on narrative techniques. [3] (Offered 2007/2008)

239. The African Novel. The postcolonial francophone novel of Maghreb and Sub-saharan illustrating issues such as tradition and modernity, the identity of Africa, the representation of women, and the ideology of language. Recommended: 222. [3] (Offered 2007/2008)

253. Literature of the Fantastic. The theme of the fantastic in nineteenth- and twentieth-century prose fiction. Critical analysis using psychological and psychoanalytic concepts. Offered in France. [3] (Offered 2007/2008)

255. French Feminist Thought: Literary and Critical. Feminist themes in twentieth-century French literature and criticism. Authors include Beauvoir, Duras, Sarraute, Irigaray, Cixous. FALL. [3] Debrauwere-Miller.

256. Contemporary French Political Thought. Themes and concepts of major twentieth-century philosophers and philosophic movements. SPRING. [3] Froment-Meurice.

260. Enlightenment and Revolution. Major writers of the eighteenth century, including Montesquieu, Voltaire, Rousseau, Diderot; literature of the Revolution. [3] (Offered 2007/2008)

261. Age of Louis XIV. Literature and society in the reign of Louis XIV. Authors include Mme de Lafayette, La Fontaine, Molière, Pascal, Racine, and Mme de Sévigné. [3] Armstrong. (Offered 2007/2008)

265. From Romanticism to Symbolism. Nineteenth-century literature through its major movements; Romanticism, Realism, Naturalism, and Symbolism. [3] (Offered 2007/2008)

267. Twentieth-Century French Literature. Critical readings of representative works organized thematically with emphasis on their contextual and intertextual relationships. [3] (Offered 2007/2008)

289. Independent Study. Content varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available in the regular curriculum. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed 12 over a four-semester period]

294. Special Topics in French Literature. The subject will vary and will be announced in the *Schedule of Courses.* FALL, SPRING. [3]

295. Special Topics in French Language and Civilization. The subject will vary and will be announced in the *Schedule of Courses.* FALL, SPRING. [3]

300. Introduction to Research. Materials and methods of scholarly research, with attention to their relation to theories of literature. [3] (Offered 2007/2008)

302. History of the French Language: Medieval Period. Syntax, morphology, phonology, emphasis on textual explication. Prerequisite: elementary knowledge of Latin. SPRING. [3] (Not currently offered)

310. Foreign Language Learning and Teaching. (Also listed as German 310, Portuguese 310, and Spanish 310) Principles and practices of teaching a second language, with concentration on recent interactive and communicative models of foreign language instruction. Goals of the course are 1) to introduce principles of Second Language Acquisition and learning, 2) to critically read relevant literature in the area(s), and 3) to develop FL instructor's awareness through reflective and critical thinking. Classroom observations, journal writing, development of materials, and a small action-research project are expected. Required of all entering teaching assistants. [3] Scott. (Offered 2007/2008)

318. Applied French Linguistics. Phonetics, morphology, syntax, and semantics, with application to teaching; theories of second language acquisition. Prerequisite: Linguistics 201 or its equivalent. FALL. [3] Scott.

320. Linguistics and the Study of French Literature. Linguistics and related disciplines such as stylistics and pragmatics and their application to the analysis of literary texts. [3] (Not currently offered)

332. Seminar in Medieval French Literature. [3] (Offered 2007/2008)

338. Seminar in Sixteenth-Century French Literature. SPRING. [3] Ramey.

342. Seminar in Seventeenth-Century French Literature. FALL. [3] Tucker.

353. Seminar in Eighteenth-Century French Literature. SPRING. [3] Ward.

362. Seminar in Nineteenth-Century French Literature. [3] (Offered 2007/2008)

369. Master's Thesis Research. [0]

372. Seminar in Twentieth-Century French Literature. SPRING. [3] Debrauwere-Miller.

380. French Literary Theory. (Also listed as Comparative Literature 380) Literary theory as it has been shaped by and shapes the French tradition. [3] (Not currently offered)

388. Seminar in Francophone Literature. Literature of the French-speaking world ("La Francophonie"). [3] (Offered 2007/2008)

394. Special Topics in French Studies. Problems, themes, or issues in literature, language, or culture approached in ways that transcend traditional chronological distinctions. FALL. [3] Froment-Meurice.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Gender Studies

See Women's and Gender Studies

Germanic and Slavic Languages

CHAIR Dieter H. Sevin
DIRECTOR OF GRADUATE STUDIES Meike G. Werner
PROFESSORS Barbara Hahn, John A. McCarthy, Dieter H. Sevin
ASSOCIATE PROFESSORS Konstantin V. Kustanovich, David A. Lowe, Meike G. Werner
MELLON ASSISTANT PROFESSOR Margaret Setje-Eilers
ASSISTANT PROFESSORS Sara Eigen, Angela Lin, Christoph Zeller

DEGREES OFFERED:

GERMAN. *Master of Arts, Master of Arts in Teaching, Doctor of Philosophy*

☙ GRADUATE studies in German at Vanderbilt lead to the M.A., the M.A.T., and the Ph.D. The program leading to the M.A. degree is designed primarily to deepen and broaden the student's knowledge of German literature from its beginnings to the present day, with special emphasis on major areas not usually covered in-depth in an undergraduate course of study. The program is also intended to lay the groundwork for possible continuing study toward the Ph.D.

Candidates for the master's degree must meet three separate requirements: complete 30 hours of formal course work, submit written evidence of research abilities, and pass an oral examination based on course work and the departmental core reading list. Nine of the 30 hours are to be at the 300 level in the department, and a minimum of 3 hours should be in a graduate

seminar (i.e., numbered 386–391). Up to 6 credit hours may be transferred from outside the university. The oral examination is normally taken at the end of the student's third semester. As a rule, independent study will not fulfill the requirement of formal course work. Evidence of research abilities will usually take the form of a research paper of twenty-five to thirty pages that is based on a term paper and is to be submitted no later than the end of the student's fourth semester at Vanderbilt. As an alternative, students may choose to complete 24 hours of formal course work and to write a master's thesis. The latter is a research paper of sixty to eighty pages in length that gives evidence of scholarly competence and independent, critical thought. The research-writing requirement for this latter option is satisfied after the formal course work and the oral examination have been completed.

The department expects candidates to meet all formal course requirements for the master's degree within three semesters. The student must maintain a minimum *B* average, provide evidence of scholarly research abilities, and pass the oral examination to receive her/his degree. The M.A. examination committee consists of three faculty members drawn from the department; usually—but not necessarily—the chair or the director of graduate studies serves as one of the examiners.

In order to be admitted to candidacy for the master of arts degree, a student is required to prove ability in writing and speaking German to the satisfaction of the department.

All candidates awarded a Teaching Assistantship will enroll in Foreign Language Teaching Theory and Practice during their first term of teaching. The student arranges her/his program in consultation with the director of graduate studies and in recognition of departmental objectives.

The M.A.T. option offers up to 12 semester hours in the areas of methods of teaching (courses, research projects, and teaching internships). Work in this area is in addition to the minimum degree requirements for the M.A. in German. Students opting for the full program can expect to add at least one semester's work to their course of study.

Doctor of Philosophy

Admission to the M.A. program does not imply acceptance for candidacy in the Ph.D. program. Performance well above the minimum Graduate School requirement of a *B* is expected for admission to the Ph.D. program. Candidates normally obtain the M.A. before going on for the Ph.D. The purpose of the doctoral degree at Vanderbilt is to develop the talented candidate's capacity to make independent contributions to the field of German literature and cultural studies. Transfer students should consult the Graduate School requirements for the doctorate.

The Ph.D. degree requires at least two academic years of graduate study beyond the master's degree. A total of 72 credits beyond the B.A. degree is mandated by the Graduate School, thus 42 credits beyond the M.A. at Vanderbilt are necessary. A minimum of 36 of these hours are done in formal course work; most should be at the 300 level with a minimum of 12

required seminar hours. Moreover, at this advanced level of study, the candidate will have considerable latitude in developing a focus (9 hours) in a related discipline or in crossdisciplinary studies relevant to Germanics, for example, in comparative literature, critical theory, philosophy, political science, or history. The department encourages students of German to incorporate an interdisciplinary dimension into their doctoral work that might include the philosophy of language, political and social history, women's writing and the production of culture, censorship practices, or the impact of philosophy on aesthetic concepts and forms. Students completing a dissertation have the option under certain conditions of enrolling in 3995, half-time research (maximum of six years).

The director of graduate studies in German assists in devising related areas of concentration so that the student, at this stage, can be narrowing her/his focus for a dissertation topic. Faculty members actively assist students to determine the most promising topics for innovative research by pointing out interesting knowledge gaps, theoretical issues, or interdisciplinary questions.

A reading knowledge of French is usually expected, but another language may be substituted with the approval of the examination committee if it is felt that this language is relevant to the candidate's area of concentration or dissertation research. The second language requirement must be fulfilled before the candidate may take the comprehensive examination.

The teaching program option offers up to 12 credit hours in the area of teaching methodology (courses, research projects, and teaching internships). Work in this area does not count toward minimum degree requirements; 4 hours is normally the minimum in this program. Students opting for the full program should expect to add at least one semester to their course of study.

German

213–214. German Conversation and Composition. Graduate credit for M.A.T. candidates only. Prerequisite: 103. FALL, SPRING. [3–3] Werner, Sevin.

216. Business German. 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, policies, and laws in German-speaking countries; advertising and marketing strategies, letters, vitae, phone calls, and personal interviews. SPRING. [3] Setje-Eilers.

220. Advanced Grammar. 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] Setje-Eilers. (Not currently offered)

221–222. German Culture and Literature. Introduction to major periods and genres of German cultural production from the middle ages to the present; overview of major social and political developments. Literary, philosophical, and other texts. Readings and discussions in German. FALL, SPRING. [3–3] Setje-Eilers, Werner.

223. From Language to Literature. 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: 213. FALL. [3] Eigen.

235. German Romanticism. The contributions of Schlegel, Tieck, Novalis, Eichendorff, and others to literature, philosophy, and theory. Intellectual, social, and political currents. [3] Lin. (Not currently offered)

237. Women and Modernity. 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] Werner. (Not currently offered)

238. Interconnections of Arts and Science: Goethe and the Natural World. (Also listed as Physics 238) Mutual influences between the arts and science, as exemplified in Goethe's *Faust* and *Elective Infinities*. Readings in English, with option of German readings for German Studies majors. Focal points: empirical investigation, philosophical interrogation, and scientific explanation. Prerequisite: completion of Basic Science requirement. [3] Haglund (Physics), McCarthy. (Not currently offered)

241. The Racial Imagination. The complex and contradictory history of the idea of "race" as a scientific category. Study of medical, scientific, philosophical, anthropological, and literary texts. No German required. [3] Eigen. (Not currently offered)

243. The Aesthetics of Violence: Terror, Crime, and Dread in German Literature. 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] Zeller. (Not currently offered)

244. German Fairy Tales: From Brothers Grimm to Walt Disney. The German fairy tale tradition and its role in American culture. No German required. FALL. [3] Eigen.

245. Love and Friendship. Concepts of life and friendship, Greek antiquity to Romanticism, modern and postmodern times. Philosophical and literary texts, letters, and essays. Taught in English. [3] Hahn. (Not currently offered)

246. German Masterpieces in English Translation. Emphasis on the classical period and the present. Authors such as Goethe, Grass, Hesse, Kafka, T. Mann, and Schiller. No knowledge of German required. [3] (Not currently offered)

248. German Lyric Poetry—Form and Function. Lyric forms as a reaction to personal trauma, collective desire, scientific and technological advances, and social change since the Thirty Years' War. Love, loss, liberation. Students compose poems in imitation of classic examples of the folk song, ballad, sonnet. [3] McCarthy. (Not currently offered)

262. German Literature of the Middle Ages. Examines sites of literary production (monasteries, courts, urban centers) and the evolution of literary language. [3] Werner. (Not currently offered)

263. The Age of Goethe—Weimar 1775 to 1805. 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] McCarthy. (Not currently offered)

264. Pleasures and Perils in Nineteenth-Century Theater. The German drama and dramatic theory from Romanticism up to Naturalism with emphasis on selected works by Kleist, Büchner, Grillparer, and Hebbel. [3] Setje-Eilers. (Not currently offered)

265. Revolutionizing Twentieth-Century Theater. German drama and dramatic theory from Naturalism to the present. Emphasis on Brecht and post-Brechtian drama. [3] Zeller. (Not currently offered)

266. Nineteenth-Century Prose. A study of representative works of the main literary trends from Romanticism to Naturalism. [3] Lin. (Not currently offered)

267. The German Novel from Kafka to Grass. A study and interpretation of the main literary trends and major figures in twentieth-century narrative. [3] Sevin. (Not currently offered)

268. Modern German Short Story. From 1945 until the present, including such authors as Ilse Aichinger, Heinrich Boell, Wolfgang Borchert, Ingeborg Bachmann, and Alexander Kluge. [3] (Not currently offered)

269. Writing under Censorship. An introduction to the main literary trends and authors of the former East Germany (1949–1989). Taught in German. FALL. [3] Sevin.

270. German Cinema: Vampires, Victims, and Vamps. 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. SPRING. [3] Sevin.

271. Women at the Margins: German-Jewish Women Writers. 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. SPRING. [3] Werner.

273. Nazi Cinema: The Manipulation of Mass Culture. 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 German required. [3] Eigen. (Not currently offered)

274. Who Am I? German Autobiographies. Canonical and non-canonical texts from the nineteenth and twentieth centuries constructing cultural, religious, and gender identities. SPRING. [3] Hahn.

275. Art and Rebellion: Literary Experiment in the 1960s and 1970s. German literature under the conditions of protest and rebellion. Experiments in poetry, prose, and theater; new directions in art and media theory; historical influences. FALL. [3] Zeller.

278. Dreams in Literature. 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. [3] Hahn. (Not currently offered)

280. Murder and Mayhem: The *Sturm und Drang*. *Sturm und Drang* literary and social movement (1767–1782). Literary genres and themes (e.g., infanticide, suicide, fratricide; primitivism, educational reform, utopian visions). Drawn from French (Diderot, Rousseau, Mercier) and English (Young, MacPherson, Shakespeare) impulses. The young Goethe and Schiller, Herder, Hamann, Lenz, L. Wagner. [3] McCarthy. (Not currently offered)

289a–289b. Independent Readings. Designed for majors and qualified undergraduates. 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. [Variable credit: 1–3 each semester, not to exceed a total of 6 over a four-semester period, in both courses combined]

294a–294b. Selected Topics. Topics of special interest in language, literature, and culture, e.g., The Image of America in German Literature, German Exile Literature, Germany in the Twenties, Kafka, Brecht, Scientific Readings, Literature and Art in the Middle Ages, *Faust*, Austrian and Swiss Literature. Topics to be announced in the *Schedule of Courses*. [3–3, not to exceed a total of 12]

310. Foreign Language Learning and Teaching. (Also listed as French 310, Portuguese 310, and Spanish 310) Principles and practices of teaching a second language, with concentration on recent interactive and communicative models of foreign language instruction. Goals of the course are 1) to introduce principles of Second Language Acquisition and learning, 2) to critically read relevant literature in the area(s), and 3) to develop FL instructor's awareness through reflective and critical thinking. Classroom observations, journal writing, development of materials, and a small action-research project are expected. Required of all entering teaching assistants. FALL. [3] Scott.

312. Foreign Language Curriculum Development and Evaluation. (Also listed as French 312, Portuguese 312, and Spanish 312) Focus on planning, development, implementation, and evaluation phases of language teaching from a systematic curriculum development perspective. Students are expected to become conversant with the research literature in the area and work on curricular projects according to their interests. An important part of the course will be dedicated to program evaluation, including training in recognized instruments and procedures to analyze and interpret data. They are expected to produce a research-based curricular project. [3] (Not currently offered)

314. Bibliography and Methods. An introduction to German studies in the U.S., to the resources and practice of literary history and criticism. FALL. [3] McCarthy.

316. Literary Theory and Criticism. Selected problems of literary theory, history, and interpretation. [3]

329a. Teaching Program Option: Internship in Advanced Language and Literature Courses. Graduate interns participate in the teaching of advanced language or literature courses and receive training in the writing of syllabi, text selection, testing, the development of supplementary materials, the selection of visual aids. FALL, SPRING. [Variable credit: 1–2 each semester, not to exceed a total of 6]

330. Expressionism. The chief intellectual movement in Germany and Austria from 1910 to 1925. Topics include all genres of literature with frequent references to other disciplines including politics, the pictorial arts, and film. In German. [3] McCarthy. (Not currently offered)

335. Enlightenment and Its Literary Connections. (Also listed as Comparative Literature 330 and English 330) Philosophy and literature in the age of reason; emphasis on aesthetic innovation and rise of the modern individual; authors include Locke, Kant, Richardson, and Lessing. [3] McCarthy. (Not currently offered)

340. Beyond Good and Evil. [3] McCarthy. (Not currently offered)

351. Philosophical Backgrounds of German Literature. Survey of German philosophical thinking from Leibnitz to Nietzsche and its importance for German literature from Goethe to Hesse. [3] McCarthy. (Not currently offered)

369. Master's Thesis Research. [0]

385a–385b. Problems in Germanic Languages and Literatures. SPRING. [3–3]

Graduate seminars in German explore individual authors, forms, theories, or works at an advanced level. Recent selections include Twentieth-Century Reception of Medieval Literature, Rise of the Author, Büchner, Kleist, Expressionism, Exile Literature, and Christa Wolf. Topics to be announced in the Schedule of Courses. *May be repeated for credit.*

387. Seminar: Studies in Medieval Literature. [3] (Not currently offered)

388. Seminar: Studies in Literature 1400–1680. [3] (Not currently offered)

389. Seminar: 18th-Century German Literature. FALL. [3] McCarthy.

390. Seminar: 19th-Century German Literature. [3] Eigen, Sevin. (Not currently offered)

391. Seminar: 20th-Century German Literature. The Aesthetics of Violence. FALL. [3] Zeller.

392. Seminar: Problems of Theory in German Studies. Author, Archive, Work. SPRING. [3] Hahn.

393. Seminar: Intellectual Constellations. [3] Hahn. (Not currently offered)

394. Seminar: Society and Ethics. [3] Hahn. (Not currently offered)

395. The Racial Imagination. The complex and contradictory history of the idea of "race" as a scientific category. Study of medical, scientific, philosophical, anthropological, and literary texts. No knowledge of German is required. FALL. [3] Eigen.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Russian

Courses in Russian may be used as minor credit in graduate programs.

171–172. Russian Culture. The evolution of Russian civilization. The interplay between East and West in the shaping of Russian cultural achievements and national identity. No knowledge of Russian required. 171: From Kievan Russia to 1880. 172: From 1880 to the present. [3–3]. (Not currently offered)

221–222. Survey of Russian Literature in English Translation. Main currents, writers, and works of Russian literature. 221: the nineteenth century: Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy. 222: the twentieth century: Bulgakov, Pasternak, Solzhenitsyn, Aksenov, Trifonov, and Petrushevskaya. No knowledge of Russian required. [3–3] Lowe, Kustanovich. (Not currently offered)

223–224. Composition and Conversation. Development of all language skills at the intermediate-advanced level. Reading of contemporary short stories. Prerequisite: 204. FALL, SPRING. [3–3] Lowe, Kustanovich.

231. Jews in Russian Culture: Survival and Identity. A course on the history of Jewish contributions to Russian culture, including literature, the visual arts, theater, and film. Questions of assimilation, the rise of Jewish national consciousness, and interest in Jewish heritage are discussed. No knowledge of Russian required. [3] (Not currently offered)

232. The Evil Empire: Stalin's Russia. Life in Stalin's Russia as portrayed in memoirs, novels, stories, poetry, films, and music. No knowledge of Russian required. SPRING. [3] Lowe.

233. *Crime and Punishment*. Dostoevsky's psychological thriller *Crime and Punishment* and two kinds of related texts: those that influenced Dostoevsky's classic crime novel (works by Pushkin and Balzac) and those influenced, in turn, by Dostoevsky's novel (works by Nabokov and Trifonov). No knowledge of Russian required. [3] (Not currently offered)

234. The Russian Cinema. Socialist Realism of the 1930s to 1950s; masterpieces of the post-Stalin era in the 1960s and '70s; sex and violence of the Perestroika; new post-Soviet cinema. Films by such directors as Eisenstein, Pyryev, Romm, Tarkovsky, Mikhalkov, and Sokurov are studied and discussed within the political context. No knowledge of Russian required. FALL. [3] Kustanovich.

257–258. Advanced Composition and Conversation. Prerequisite: 224 or equivalent. [3–3] (Not currently offered)

289a–289b. Independent Readings. Consists of a project to be carried out under the supervision of a member of the depar tment faculty. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed a total of 6 over a four-semester period, in both courses combined]

Hearing and Speech Sciences

CHAIR Fred H. Bess
DIRECTOR OF GRADUATE STUDIES Edward G. Conture
PROFESSORS EMERITI Russell J. Love, Judith Rassi, R. E. Stone Jr., Robert T. Wertz
PROFESSORS Fred H. Bess, Stephen M. Camarata, Edward G. Conture, D. Wesley Grantham, Linda J. Hood, Gary P. Jacobson, Howard S. Kirshner, Gus Mueller, Ralph N. Ohde, Robert H. Ossoff
RESEARCH ASSISTANT PROFESSORS Benjamin W. Y. Hornsby, Alexandra Key, Doug Sladen
CLINICAL PROFESSOR Gary A. Duncan
ASSOCIATE PROFESSORS Daniel H. Ashmead, Gene W. Bratt, Lee Ann Golper, Todd A. Ricketts, Teris K. Schery, Anne Marie Tharpe, Mark Wallace
ASSISTANT PROFESSORS Patricia F. Allen, Tamala Bradham, Candice Burger, Mary N. Camarata, William Dickinson, Mary Sue Fino-Szumski, David Gnewikow, Corrin G. Graham, Troy Hackett, Sue Hale, Devin McCaslin, Daniel Polley, C. Melanie Schuele, Wanda G. Webb
ASSISTANT CLINICAL PROFESSOR John R. Ashford

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

THE master's degree program provides for concentrated study in speech language pathology and is supplemented by pr ograms in early intervention educational audiology and teacher licensur e for speech-language pathology (for those desiring to work in public schools as speech-language pathologists). The master 's degree program is CAA accredited by the American Speech-Language-Hearing Association. Further information regarding graduate programs in hearing and speech sciences may be found online at *www.vbwc.com*.

The curriculum and practicum maintained for these pr ograms provide each student the opportunity to meet r equirements for certification by the American Speech-Language-Hearing Association and for licensure in virtually all states where licensure is required. To achieve this goal, the student must exceed the minimum requirements for the master's degree set by the Graduate School. Completion of the master 's program ordinarily requires four semesters and one summer session, in most cases including an externship during the fifth semester . Those students without an under graduate major in audiology/speech-language pathology will ordinarily take longer than 5 semesters to complete the master's degree. Master's degree students

complete a total of 50 to 60 hours of course work, depending on the background and/or courses needed for certification. Students who want to earn the master's degree through a thesis option instead of clinical work leading to certification must complete at least 42 to 44 semester hours of formal course work and a research-based thesis. The thesis option must receive faculty approval prior to initiation of this plan of study.

The Ph.D. degree normally requires three years of study with a minimum of 72 graduate credit hours. There are no foreign language requirements; however, the student must complete two research projects and 12 hours of course work in statistics and research methodology prior to the dissertation. Doctoral candidates also present a minor of not less than 12 hours taken outside the department or from another subject area in hearing, speech, and language. The final year of the program is typically devoted to the dissertation.

This department also offers the Doctorate of Audiology (Au.D.) through the Medical School (*www.vanderbilt.edu/catalogs/medical/09_MEDV01.pdf*, page 361).

The teaching, clinical, and research programs of the department are housed primarily in Vanderbilt's Bill Wilkerson Center.

206. Anatomy and Physiology of Speech and Hearing Mechanisms. The basic processes of speech production, acoustics, and perception. Neuroanatomy, anatomy, physiology, acoustics, and acoustic correlates of sound features. Intended for undergraduates and graduate students outside the Department of Hearing and Speech Sciences. SPRING. [3] Ohde.

217. Hearing Disorders and Assessment. An introduction to the major pathologies of the peripheral and central auditory system as well as the medical/surgical treatment of those pathologies, followed by an introduction to the equipment and procedures used to assess auditory function in patients of all ages. SPRING. [3] Hornsby.

300. Neurology of Speech and Language. The structure and function of the nervous system, with emphasis on the neural mechanisms of speech and language. Neurologic conditions producing speech and language disorders are surveyed. FALL. [3] Webb.

301. Acoustics and Perception of Speech and Speech Disorders. An examination of the processes of speech production, acoustics, and perception. Emphasis on relevant literature and research techniques in speech science. FALL. [3] Ohde.

302. Hearing Science. A discussion of basic acoustics as it applies to hearing science. Anatomy and physiology of the peripheral and central hearing mechanism and vestibular system. FALL. [3] Hackett.

304. Child Language Acquisition. The components and processes of normal language development. Relation to social and cognitive aspects of child development. Survey of developmental psycholinguistic research. FALL. [2] Schuele.

305. Clinical Principles and Procedures. Presentation and demonstration of clinical principles and procedures applicable in communication sciences and disorders. FALL. [3] Golper.

306. Child Language Disorders. The language development of children of variant populations. Focus on description of populations, assessment techniques, and intervention strategies. Clinical applications of research in normal language acquisition. FALL. [3] Schuele.

307. Seminar: Topics in Childhood Language Disor ders. Current issues in nor mal language acquisition and clinical applications to variant populations. Content of seminar rotated. FALL. [2] Staff.

309. Language and Literacy in Childr en with Hearing Loss. This course pr esents an overview of normal language acquisition and the challenges imposed by a hearing loss. A variety of methods and materials to develop oral and written language and r eading will be included. Practical methods of assessment, supportive strategy development, and curricular adaptations for children with hearing loss will be explored. SPRING. [3] TBA

310. Measurement of Hearing. The theory and practice of hearing measur ement, with emphasis on r outine clinical and scr eening audiometric techniques, testing envir onment, audiometric standards and calibration, applied impedance measur ements, and interpretation of audiometric tests. FALL. [3] Gnewikow.

311. Stuttering. Significant research in the field of stuttering, with emphasis on etiology and therapy. The management of fluency disturbances. SPRING. [3] Conture.

312. Psychology and Culture of the Deaf. Presentation and discussion of significant historical and current issues relating to the Deaf population. Primar y focus will be on psychological development, educational/methodological models, and Deaf cultur e. Although the principal focus is on the psycho/social and cognitive/intellectual development of deaf individuals through the lifespan, a general survey of other ar eas of exceptionality is made with emphasis on the implications for the deaf child with additional disabilities and/or special needs. SPRING. [2] TBA

313. Management of Communication Disorders in the Schools. This course provides an overview of management principles and practices for childr en with communication disorders during the school-age years. Curriculum-based communication assessment and methodologies for implementation of communication pr ograms in school settings will be addressed. SPRING. [3] Hausman.

314. Articulation Disor ders and Clinical Phonetics. The etiology, evaluation, and management of ar ticulatory defects in childr en and adults. Pr erequisite: consent of instructor. FALL. [3] Ohde.

315. Introduction to Autism Spectrum Disorders. This class will provide an overview of normal social, play, linguistic, and cognitive development compar ed to the featur es and behavioral characteristics of autism spectrum disor ders (ASD) and will intr oduce the student to causative factors and management approaches with ASD. SPRING. [3] Hale, Wallace.

316. Motor Speech Disorders. A study of the nature and treatment of the adult and childhood dysarthrias and dyspraxias of speech. Management of infants and young childr en at neurological risk for developing motor speech disability. Rights of the severely communicatively disabled. Prerequisite: 300 or consent of instructor. SUMMER. [2–3] Webb, Golper.

317. Aphasia/Traumatic Brain Injury. This course is taught in thr ee modules in the following sequence: I) Cognitive-Communicative Disorders Following Acquired Brain Injuries, II) Adult Aphasia, and III) Communication in Association with Right Hemispher e Damage and Dementia. These modules examine the pathophysiology of acquir ed brain injuries and str oke and neuroanatomical correlates of the cognitive and communicative impair ments associated with these conditions. Dif ferential diagnosis, evidence-based tr eatment, and outcomes assessments are stressed in a review of the management of individuals who have had traumatic brain injuries, aphasia, and r elated conditions, and their co-survivors. SPRING. [4] Golper, Webb, Allen, Jacobson.

318. Educational Audiology and Aural Habilitation for Children. A survey of approaches to aural rehabilitation for children. Specific focus will be on intervention for children with hearing loss in educational and other habilitative settings. SPRING. [3] Tharpe.

319. Dysphagia. The study of the normal and disordered swallow in pediatric and adult populations. Anatomy and physiology, videofluoroscopic and other assessment procedures, as well as various treatment alternatives and techniques are included. FALL. [3] Ashford.

320. Introduction to Amplification for Infants and Children. Designed for deaf education and speech-language pathology students. Current issues and trends in conventional amplification for infants and children. Selection, fitting, verification, and validation of traditional amplification options will be addressed including directional vs. omnidirectional microphones, analogue vs. digital instruments, monaural vs. bilateral fittings, and real-ear measures vs. functional-aided gain. Hearing aid retention, maintenance, and troubleshooting techniques are addressed. FALL. [2] TBA

321. Seminar: Intervention for Pediatric Acquired Brain Injury. Assessment and intervention techniques for cognitive/communicative and behavioral deficits associated with pediatric acquired brain injuries. Emphasis on effects on normal development, educational curricula modifications and teacher/family training. Prerequisite: 317 or permission of instructor. SUMMER. [2] Allen.

323. Early Assessment and Intervention Methods in Children with Autism Spectrum Disorders. The course addresses basic theories and principles associated with assessment and management of children with Autism Spectrum Disorders. Auditory characteristics, classroom structure, behavior management, communication strategies, social and peer interaction, and family-focused practices are also addressed. FALL. [2–3] Hale.

325. Pediatric Audiology. Methods and procedures used in the evaluation of the auditory function and management of neonates, infants, and young children. Includes identification and intervention procedures. FALL. [3] Tharpe.

327. Hearing Loss and Speech Understanding. This course examines various factors that may affect the speech understanding of persons with hearing loss. The contribution to the unaided and aided speech understanding of persons with hearing loss of 1) subject factors, such as degree of hearing loss, and deficits in frequency and temporal resolution, and 2) environmental factors, such as, the level and type of background noise, reverberation and talker characteristics, will be examined. Methods for predicting speech understanding will also be discussed. SPRING. [3] Hornsby.

328. Psychoacoustics. Psychoacoustic theory and methods. Auditory perception in normally hearing and hearing impaired subjects. SPRING. [3] Hornsby.

330. Advanced Audiologic Evaluation I. Diagnostic audiometry principles and procedures, including acoustic reflex measures, speech audiometry, auditory brainstem response (ABR), and electrocochleography (ECochG). Also, newborn auditory screening with ABR. Practicum required. SPRING. [3] Jacobson.

331. Teaching Children with Hearing Loss to Listen and Speak. Theories of and methods for developing auditory perception and spoken language skills in deaf and hard-of-hearing children. The purpose of this course is to increase students' skills in assessing and developing speech, auditory functioning, and phonologic awareness in deaf and hard-of-hearing children. SPRING. [3] TBA

332. Pathology of the Auditory System. Auditory pathologies resulting from genetic origin, disease, injury to the ear, and lesions of the nervous system. FALL. [3] Bratt.

334. Seminar in Neurogenic Communication Disorders. Research literature on the relationship between brain and speech-language performance, emphasizing current methodology for studying neurological speech and language disorders. Prerequisite: 300 or 331 or consent of instructor. FALL. [2] Staff.

335. Seminar in Augmentative Communication. The application of augmentative communication devices to patients with physical and/or cognitive disabilities. The various types of devices available, the techniques for selecting and applying these systems to individual patients, and specific information on how to achieve effective conversational use of such systems. FALL. [2] Webb.

336. Communication Disorders Associated with Craniofacial Anomalies and Voicing Disorders. Theories of resonance and voice production, normal development, etiology, assessment, and management of speech communication disorders associated with craniofacial anomalies and vocal production. SUMMER. [4] Kirby, Ashford.

338. Research Methods in Communicative Disorders. Research techniques and procedures. Analysis of research examples from the literature. Study of design of experiment, data collection, statistical analysis, and presentation of research findings. FALL. [1] Camarata.

340. Amplification I. Background and development of the design of hearing aids, earmold acoustics, electroacoustic characteristics, performance standards and measurement techniques, clinical selection and evaluation procedures. FALL. [3] Ricketts.

341. Seminar in Audiology. Significant literature in the field of audiology. Directed study in assigned subject areas. FALL, SUMMER. [2] Staff.

342. Advanced Audiologic Evaluation II. Central auditory assessment. Selected neurophysiology clinical procedures in audiology, including otoacoustic emissions, auditory middle-latency, late and P300 responses and brain mapping, somatosensory and visual evoked responses, electroneuronography, and OR/ICU neuromonitoring. Practicum required. FALL. [3] Jacobson.

343. Hearing Conservation. A discussion of noise levels, OSHA guidelines, noise-induced hearing loss, and hearing protection in work and leisure activities. Industrial audiology including testing, training, and intervention protocols. SUMMER. [3] Gnewikow.

344. Administrative Issues in Communicative Disorders. A discussion of some of the important issues affecting the administration of programs in communication disorders. Emphasis on business management, marketing, financial management, third-party payors, grants and contracts, state and federal agencies, and fundraising. SUMMER. [Variable credit: 2–3] Bess.

345. Amplification II. Advanced topics in amplification including: advanced probe microphone techniques, single and multi-channel compression systems, analog and digital signal processing, and current and emerging prescriptive and fitting verification methods. FALL. [3] Ricketts.

346. Assessment of Vestibular Disorders. An in-depth approach to the assessment of the dizzy patient. Subject matter will include: anatomy and physiology of the peripheral and central vestibular, ocular motor and postural control systems; introduction to both electrical and video techniques for recording the vestibulocular reflex; case history and bedside assessment of the dizzy patient, technique and interpretation of electronystagmography, rotational testing, computerized dynamic posturography and sonomotor responses; assessment of self-report dizziness handicap, falls risk assessment in the elderly and vestibular rehabilitation. Students will be expected to conduct practica outside the classroom. SUMMER. [3] Jacobson, McCaslin.

347. Management of Vestibular Disorders. This course will focus on interpretation and analysis of balance laboratory results in dizzy patients as well as treatment and therapy provided by other professionals. Subject matter will include: advanced concepts in central vestibular system physiology, peripheral and central disorders of the vestibular system and their clinical findings, introduction to imaging dizzy patients, disequilibrium of aging and risk of falls assessment, drug treatment of vertigo, surgical treatment of vertigo, and vestibular rehabilitation. FALL. [3] Jacobson, McCaslin.

348. Audiology in Education. (Also listed as Special Education 2600) Current issues and trends concerning the role of the audiologist in the public school setting. Emphasis on early identification and intervention, inservice education, amplification, and the roles of federal, state, and local agencies in providing services to the hearing-impaired school-age population. SPRING. [3] Fino-Szumski.

349. Laboratory: Audiology in Education. Demonstration and hands-on experience with personal and classroom amplification systems. Operation and troubleshooting of amplification systems commonly used in a classroom setting. Specifically, hearing aids, FM systems, assistive listening devices, vibrotactile devices, and cochlear implants will be demonstrated. Co- or prerequisite: SPED 2600 or HRSP 2600. FALL. [1] Fino-Szumski.

351. Special Problems in Speech Pathology. Areas and problems not included in other courses in speech pathology, chosen to fit the students' interests and the needs of their programs. May be repeated to a total of 12 hours. FALL, SPRING, SUMMER. [Variable credit: 1–6] Staff.

352. Special Problems in Audiology. Areas and problems not included in other courses in audiology, chosen to fit the students' interests and the needs of their programs. May be repeated to a total of 12 hours. FALL, SPRING, SUMMER. [Variable credit: 1–6] Staff.

353. Auditory Prostheses. Design and evaluation of auditory prostheses for listeners with hearing loss. Theoretical and clinical considerations of cochlear and auditory brainstem implants as well as hearing aids from a prostheses perspective. SPRING. [3] Ricketts.

354. Cochlear Implants for Infants and Children. Current issues in the medical, audiological, speech/language, and educational management of children with cochlear implants. Emphasis on multidisciplinary team function. Intended for undergraduates in Deaf Education and graduate students in Hearing and Speech Sciences. Prerequisite: 318. SPRING. [3] Tharpe.

355. Clinical Internship/Externship in Speech-Language Pathology. Sequence of clinical practicum placements over five semesters for speech-language pathology majors in clinical track. Designed to meet supervised-practicum requirements for eventual certification by American Speech-Language-Hearing Association. Sequence of initial part-time internship placements in campus and other local facilities, followed by a full-time externship placement at one of many selected sites throughout the country or abroad. SPRING, SUMMER. [6–7] Hale.

356. Internship/Externship: Maymester. A three-week intensive, full-time clinical or classroom placement during the month of May in an auditory-oral environment designed specifically to meet the student's individual interests and needs. May Session. [Variable credit: 0–3] TBA

357. Professional Issues in Communication Disorders. Examines various professional issues within the fields of speech-language pathology and audiology. For example, ethics, malpractice, quality improvement, marketing, reimbursement, multicultural sensitivity, and federal legislation. SPRING. [1] Hale.

359. Audiometric Instrumentation and Calibration. An introduction to fundamental concepts in electronics and computer science and to instrumentation used in the hearing clinic or research laboratory for producing, measuring, and analyzing audio signals. Standards and procedures for calibration measurements, with practical hands-on experience. FALL. [3] Grantham, Ricketts.

361. Principles of Counseling and Interviewing in Communication Disorders. Examines the helping relationship in the clinical process, counseling theory relative to audiology and speech-language pathology practices, and principles and methods of effective clinical interviewing and counseling. TBD. [2] Hale.

363. Hearing and Aging. A survey of major concepts in gerontology, including demographics, psychosocial aspects of aging, biology of aging, and clinical conditions of the older adult. Physiological changes within the aging auditory system, and clinical issues in audiological assessment and intervention with older hearing-impaired patients. SUMMER. [3] Rosenfeld.

369. Master's Thesis Research. [0]

371a–371b. Research Design and Statistical Analysis. Covers topics in research design and statistics for students preparing for research careers in hearing science, speech science, and communication disorders. Reviews mathematical bases for probability theory and statistical inference. Covers fundamental parametric and nonparametric statistical tests, with extensive discussion of research design in the context of analysis of variance. Presents statistical properties of psychophysical methods and signal detection theory. FALL, SPRING. [3–3] Ashmead.

373. Signals and Systems for Hearing and Speech Sciences. A hands-on laboratory course that concentrates on applications for communications science. The course covers: (1) the fundamentals of analog signals, including the Fourier transform and representation of signals in the time and frequency domains; (2) the fundamentals of analog systems (filters), including representation in the time and frequency domains and the analysis of signals that pass through systems; (3) an introduction to digital signals and digital systems, including digital filter design; and (4) an introduction to MATLAB, a powerful tool for understanding and implementing signals and systems. SUMMER of odd-numbered years. [3] Grantham.

375. Seminar in Medical Audiology. Advanced study at the doctoral level of the medical aspects of audiology and the relationship of audiology to otology and neuro-otology. May be repeated for credit. Prerequisite: consent of instructor. [Variable credit: 1–3] (Not currently offered)

377. Seminar in Speech Perception. The study of the processes and models underlying the perception of speech features. Relevant acoustic correlates for speech perception will be evaluated, and these properties will be emphasized through the generation of synthetic speech. The course will cover the contributions of speech perception research to our understanding of speech development, and language and hearing disorders. SPRING. [3] Ohde.

379. Advanced Seminar in Audiology. A doctoral-level course focusing on special topics of interest to faculty and students based on recent research developments in audiology. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING. [3] Staff.

380. Advanced Seminar in Speech Pathology. A doctoral-level course focusing on special topics of interest to faculty and students and based on recent research developments in speech pathology. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING, SUMMER. [3] Staff.

381. Advanced Seminar in Language. A doctoral-level course focusing on special topics of interest to faculty and students and based on recent research developments in language. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING, SUMMER. [3] Staff.

382a–382b. Seminar: Research in Audiology. An advanced study of research for the second-year doctoral student. Directed individual research culminating in oral presentation and a manuscript. Prerequisite: consent of instructor. [2–2] (Offered on demand)

383. Practicum Case Conference. This course includes attendance at weekly case conferences where clinical case studies will be presented. The grade for this class will include clinical performance and attendance. FALL, SPRING, SUMMER. [1] Hale and Ricketts.

385. Instrumentation for Hearing and Speech Sciences: Stimulus Generation, Measurement, and Calibration. A hands-on introduction to the principles and techniques of setting up equipment for hearing and speech perception experiments. Students are exposed to analog generators (noise generators, function generators, oscillators, computer-controlled digital-to-analog converters) processing devices (attenuators, filters, mixers, amplifiers), terminating devices (earphones, loudspeakers, analog-to-digital converters), and measurement devices (oscilloscope, voltmeter, spectrum analyzer). Students will learn to design and implement circuits involving these various devices, and to measure and calibrate various kinds of acoustic stimuli. Offered on request. [3] Grantham.

386. Instrumentation for Hearing and Speech Sciences: MATLAB Programming with Real-Time Applications. An introduction to the standard MATLAB computing language in a Windows environment. Basic programming concepts including data types and storage, data input and output, conditional execution, iterative programming, and the use of functions. The goal is for the student to become sufficiently comfortable with MATLAB (and with the concept of programming languages in general) to develop programs to solve specific computational problems too tedious to solve by calculator. The last third of the course will be devoted to the application of MATLAB programming to real-time laboratory problems. Prerequisite: 385. Offered on request. [3] Grantham.

387. Spatial Hearing. An advanced treatment of the perception by humans of auditory objects in space, including laboratory demonstrations. Topics include (1) binaural processing (lateralization, binaural detection); (2) localization and spatial resolution in the free-field; (3) auditory distance perception; (4) the precedence effect: localization in reverberant spaces; and (5) the central auditory nervous system: binaural pathways. Prerequisite: 328 or permission of instructor. [3]

388. Independent Study and Readings in Speech Pathology. FALL, SPRING, SUMMER. [3]

389. Independent Study and Readings in Audiology. FALL, SPRING, SUMMER. [3]

398. Preliminary Doctoral Research. [0]

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

History

CHAIR Daniel H. Usner Jr.
DIRECTOR OF GRADUATE STUDIES Richard J. M. Blackett
PROFESSORS EMERITI Howard L. Boorman, Paul K. Conkin, Charles F. Delzell, Jimmie L. Franklin, Paul H. Hardacre, J. León Helguera, Robert Isherwood, Samuel T. McSeveney, Frederick D. Schneider, V. Jacque Voegeli, Donald L. Winters
PROFESSORS Jeremy Atack, Michael D. Bess, Richard J. M. Blackett, Dennis C. Dickerson, Marshall C. Eakin, James W. Ely Jr., James A. Epstein, Gary Gerstle, Elizabeth Lunbeck, Thomas Alan Schwartz, Helmut W. Smith, Daniel H. Usner Jr., David Wasserstein
ADJUNCT PROFESSOR Ronald A. Messier
ASSOCIATE PROFESSORS William Caferro, David Lee Carlton, Katherine B. Crawford, Gerald Figal, Joel F. Harrington, Yoshikuni Igarashi, Jane Gilmer Landers, Matthew Ramsey, Ruth Rogaski, Arleen M. Tuchman, Francis W. Wcislo
ASSISTANT PROFESSORS Brandi Brimmer, Devin Fergus, Catherine Molineux, Moses Ochonu, Rowena Olegario, Frank Robinson, Edward Wright-Rios
VISITING ASSISTANT PROFESSOR Henning Grunwald
SENIOR LECTURERS Yollette Trigg Jones, Peter Lorge

DEGREES OFFERED: *Master of Arts, Master of Arts in Teaching, Doctor of Philosophy*

❧ A THESIS is required for the master's degree in history; students specializing in continental European or Latin American history must achieve reading competence in one foreign language.

The Ph.D. degree program includes at least 45 hours of formal course work. A reading knowledge of one foreign language is required. Students specializing in continental European or Latin American history must demonstrate a reading knowledge of one or more additional languages essential to their research.

Certain courses offered by other programs and by the Law School may be accepted for credit toward the degree. Additional details are available in the office of the director of graduate studies.

Students are generally expected to enroll in 300-level courses.

201. Twentieth-Century African American Religious History . Pentecostalism, gospel blues, effect of urbanization and industrialization on black churches, religion in the civil rights movement, black power and black theology, women in religious institutions, and post-denominationalism. SPRING. [3] Dickerson.

202. Science and Society after the Enlightenment. The intellectual, philosophical, and social factors influencing the development of scientific theories since the Enlightenment. [3] Tuchman. (Not currently offered)

204. History of Medicine, 1750 to the Present. The scientific, technological, cultural, and professional factors influencing the rise of medicine. Emphasis on the period since about 1750 in both Europe and America. FALL, SPRING. [3] Tuchman, Rogaski.

205. Historical Perspectives on Women, Health, and Sexuality. Women as patients and healers. Emphasis on America. 1750 to the present. Topics include women's diseases and

treatments, changing definitions of "woman," sexuality , childbirth, birth control, abortion, midwives, nurses, and doctors. [3] Tuchman. (Not currently offered)

206. Medicine, Culture, and the Body. (Also listed as Anthropology 260) Concepts of the human body from historical and cr oss-cultural perspectives. Exploration of experiences, representations, and medical theories of the body in bir th, death, health, and illness in Western and non-W estern societies. Comparison of methodologies of anthr opology and history. [3] Conklin, Tuchman. (Not currently offered)

207. The Modern Human Sciences. Sciences of the human in the U.S. and Eur ope, 1870 to the present. Measurement and testing; classifications of human types by race, gender , and sexual orientation; institutional power and discipline; dif ferentiations of the nor mal and abnormal in psychology, psychiatry, medicine, sociology, anthropology, and sexology. [3] (Not currently offered)

210. Marriage and the Family in the Middle Ages. Evolution from late antiquity to the later Middle Ages. Topics include: Roman, Germanic, and Christian influence; variations based on class; gender roles; children and attitudes toward marriage as a template for other r elations. [3] (Not currently offered)

211. Medieval Women: Late Antiquity to the Later Middle Ages. Topics include the female body; social hierarchy and status; marriage vs. the cloister; women and work; female spiritu - ality; women as readers and writers. [3] (Not currently offered)

212. Medieval Europe, 300–1000. Rome, Latin Christendom, and the East; political events and the adaptation of Roman and Christian traditions to the needs of society emerging fr om the invasions. FALL. [3] Messier.

213. Medieval Eur ope, 1000–1350. Economic expansion and the for mation of national states; the medieval Chur ch and the r evival of lear ning in the twelfth and thir teenth centuries. SPRING. [3] Caferro.

214. Europe in the Age of the Renaissance. The political, social, economic, and religious history of Europe from 1300 to 1500, with particular emphasis on the intellectual aspects of the early Italian Renaissance. [3] Harrington. (Not currently offered)

215. Europe in the Age of the Reformation, 1500–1648. The political, intellectual, and social conditions underlying the Pr otestant revolt. The Refor mation of Luther, Calvin, Zwingli, Loyola, and other r eligious reformers considered within the context of the general developments of sixteenth-century history. [3] Harrington. (Not currently offered)

218. Europe in the Age of Revolution, 1789–1815. Political, cultural, and economic upheavals in the late eighteenth and early nineteenth centuries; the Fr ench Revolution and Napoleon, romanticism, and early industrialization. Emphasis on Britain, France, and Ger - many. [3] Ramsey. (Not currently offered)

220. Europe in the Nineteenth Century . Major political, social, economic, and cultural developments from 1815 to 1914. [3] (Not currently offered)

221. Sexuality and Gender in the Western Tradition to 1700. Politics, war, and masculin- ity; Christianity and sexuality; changing ideas about gender roles and sexual practices. No credit for students who have completed 185. [3] Crawford. (Not currently offered)

222. Sexuality and Gender in the Western Tradition since 1700. Politics, war, and masculin- ity, femininity, and gender roles; origins of identity politics and changing sexual norms; contem- porary feminist issues. No cr edit for students who have completed 186. [3] Crawfor d. (Not currently offered)

223. Medieval Sexuality. Topics include: original sin and ambivalence to sex; theories of gender, asceticism, the body, gay subculture. Emphasis on primary sources. [3] (Not currently offered)

225. Europe From World War I to World War II. Political, socioeconomic, cultural, and colonial history of Europe from 1914 to the fall of Hitler. [3] (Not currently offered)

226. Europe since 1945. 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] (Not currently offered)

231. History of Germany in the Twentieth Century. 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. No credit for students who have completed 230b. FALL. [3] Grunwald.

232. History of Modern Italy. Survey of Italian political, socioeconomic, cultural, and colonial history from 1800 to the present. The Risorgimento, national unification, Liberal Monarchy, Fascism, and the Republic. [3] Bess. (Not currently offered)

233. Medieval and Renaissance Italy, 1000–1700. 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." FALL. [3] Caferro.

234. History of France from the Renaissance to the Enlightenment. Social and cultural history from 1515 to 1774. The conditions of life, ambitions, ideas, and tastes of the various social groups in France. The development of the arts, music, and literature in a social and political context. [3] Crawford. (Not currently offered)

235. Modern France. From the French Revolution of 1789 to the present. Emphasis on politics, with some attention to the major economic, social, cultural, and intellectual developments. [3] Ramsey. (Not currently offered)

237. Russia: Tsardom to Empire. Russian history from fifteenth-century Muscovite state, society, and economy; orthodox Russian culture and religion; Peter the Great and Catherine the Great; eighteenth century absolutism, empire, serfdom, and intellectual life. [3] Wcislo. (Not currently offered)

238. 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] Wcislo. (Not currently offered)

239. 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] Wcislo. (Not currently offered)

240. Medieval and Early Modern England. Cultural, political, legal and religious developments in England from its Romano-Celtic antecedents through the seventeenth century. [3] (Not currently offered)

242. England under the Tudors. Political, religious, and cultural history of England from Henry VII's accession to the death of Elizabeth I. Emphasis on the Protestant Reformation and its effects; the interaction between monarchy and parliaments; Puritans and other dissenters; Elizabethan literature, drama, art, and music; popular culture; and the witch craze. [3] (Not currently offered)

243. Britain's Century of Revolution. Politics, religion, and culture of the British Isles in the seventeenth century. Analysis of the Civil War, Republic and Cromwellian Protectorate, Restoration, Glorious Revolution, and the political theory sparked by these conflicts, including works of Milton and Marvell, Hobbes and Locke; arts and literature; scientific revolution and intellectual change; witch craze; beginnings of empire. [3] (Not currently offered)

245. Victorian England. Cultural values, liberal reform; urbanization; women and gender; imperialism. SPRING. [3] Epstein.

246. The Asian Economic Miracle. Global economic growth of the Asian Pacific region from the 1950s to the present, including repercussions of the 1997 crashes. Asian economic patterns, effect of national and regional growth on class and ethnic differences, role of state planning in economic development. [3] Staff. (Not currently offered)

247. Themes in Modern Chinese History. Intensive reading, discussion, and short papers on selected themes in Chinese social and cultural history. Particular topics vary from semester to semester. May be taken more than once if there is no overlap with a prior offering. [3] Lorge. (Not currently offered)

248. History of Chinese Medicine. The historical divergences between medicine in China and the West. Readings in Chinese medical classics, including the *Inner Cannon of the Yellow Emperor* and early herbal manuals. Chinese medicine's encounter with Western medicine in the twentieth century: the creation of "Traditional Chinese Medicine" in the PRC and the emergence of Chinese medicine as "alternative medicine" in the U.S. SPRING. [3] Rogaski.

249. History of Modern Japan. The political, social, economic, and cultural history of Japan in the nineteenth and twentieth centuries. Radical changes in the state, society, and economy and the effects of these changes on Japan's place in the world. SPRING. [3] Igarashi.

250. Cultural and Social History of Japan's Recent Past. Japanese culture and society from the 1930s to the present. Impact of war experiences on postwar Japan, and the political nature of cultural production. [3] Igarashi. (Not currently offered)

253. Subsaharan Africa: 1400–1800. 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. FALL. [3] Ochonu.

254. Africa since 1800: The Revolutionary Years. 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. SPRING. [3] Ochonu.

255. The Islamic World to 1798. History of the Islamic world, sixth century A.D. to 1789. The rise and spread of Islam as a world empire, a religious system, a cultural-economic network, and a way of life. Historical and literary sources and artifacts. SPRING. [3] Messier.

256. Nationalism and Islam in the Middle East since 1798. Secular nationalism and the changing nature of Islamic identification in the Middle East with emphasis on Egypt, Turkey, Iran, and Palestine/Israel. [3] (Not currently offered)

257. Muhammad and Early Islam. 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] Wasserstein. (Not currently offered)

258. Rise of the Iberian Atlantic Empires, 1492–1700. Pre-Columbian societies; the formation of the early Spanish state and imperial expansion in the Americas; the formation of multiethnic transatlantic societies. FALL. [3] Landers.

259. Decline of the Iberian Atlantic Empires, 1700–1820. Reorganization of the Spanish and Portuguese empires, maturation of transatlantic societies; revolutions for independence. SPRING. [3] Robinson.

261. Colonial Mexico. The cultural history of major pre-Columbian groups; the conquest and settlement by the Spaniards; colonial society through independence in 1821. No credit for students who have completed 261a. [3] Landers. (Not currently offered)

262. Modern Mexico. From independence in 1821 to the present. Political instability of the nineteenth century; the Porfirian dictatorship and the revolution of 1910; evolution and modernization of Mexico. SPRING. [3] Wright-Rios.

263. History of Gender and Women in Colonial Latin America. Gender constructions and their historical effects on Spanish, Amerindian, African, and mixed-race women from 1400 to 1800. SPRING. [3] Landers.

264. Brazilian Civilization. From pre-Columbian times to the present. Clash and fusion of Portuguese, Amerindian, and African cultures; sugar and slavery; independence and empire; the coffee economy; race relations; the search for national identity; industrialization; dictatorship and democracy in the twentieth century. SPRING. [3] Eakin.

265. History of Central America. Iberian and Amerindian background, colonial society; independence; growth of the plantation economy; the United States' presence; political and social revolutions in the twentieth century. [3] Robinson. (Not currently offered)

266. Reform and Revolution in Latin America. 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. FALL. [3] Wright-Rios.

267. The Frontier in Early America: War and Cultural Interaction. Frontiers in North America, 1500–1763. War, trade, and cultural exchange among the native, British, French, and Spanish residents of North America. The meaning of cultural frontiers and of cycles of peace and war in borderlands. FALL. [3] Molineux.

268. The English Atlantic World, 1500–1688. English overseas expansion, including conquest of Ireland, exploration and conquest of the New World. Formation of imperial and American cultures and of racism, the slave trade, Indian relations, and migration from the British Isles. [3] Staff. (Not currently offered)

269. Cultural History of the First British Empire, 1707–1783. The creation of Great Britain; expansion of British overseas interests in America, Africa, Asia, and the Pacific; development of creole cultures; British imperial policy and transatlantic cultures; the American Revolution and growth of antislavery. [3] Staff. (Not currently offered)

270. Africa and the World. Africa's commercial, cultural, and political relations with other parts of the world, especially Western Europe and the United States in the last two hundred years. Impacts of key movements of global crises on these relations, economic depression of the 1870s, World War I, the Great Depression of the 1930s, World War II, and the Cold War and African responses to these crises. [3] Ochonu. (Not currently offered)

272. The U.S. in the Era of the Civil War. Sectional conflict, secession, the Southern War for Independence, and Reconstruction; 1850–1877. [3] Olegario. (Not currently offered)

273. The Civil Rights Movement. 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. SPRING. [3] Dickerson.

275. Recent America: The United States since 1945. A general study of the postwar period, with particular attention to the dynamics of social and political change. FALL. [3] Fergus.

276. The Old South. 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. FALL. [3] Carlton.

277. The New South. 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. SPRING. [3] Carlton.

278. History of Appalachia. 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] Carlton. (Not currently offered)

279. African American History to Reconstruction. The political, socioeconomic, and intellectual history of African American people from their African backgrounds to the end of Reconstruction. Special emphasis on the institutional history of the African American community. FALL. [3] Dickerson.

280. African American History since Reconstruction. 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. SPRING. [3] Fergus.

281. The U.S. and the Vietnam War. 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] Schwartz. (Not currently offered)

282. The U.S. and the World. From the winning of independence to the Great Depression. Relationships among foreign policy, ideology, domestic politics, and social and economic change. No credit for students who have completed 280a. [3] Schwartz. (Not currently offered)

283. The U.S. as a World Power. 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. No credit for students who have completed 280b. [3] Schwartz. (Not currently offered)

285. American Social History since 1865. The social causes and consequences of such events as Progressive Reform and the Great Depression. The impact of industrialization and urbanization on the elite, labor, immigrants, blacks, women, and the family. [3] (Not currently offered)

286. Gender, Sexuality, and Race in Early American Culture, 1600–1865. 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] (Not currently offered)

287. Gender, Sexuality, and Race in American Culture, 1865 to the Present. 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. SPRING. [3] Brimmer.

288. History of American Thought from the Puritans to the Civil War. Basic beliefs and preferences, with special emphasis upon Christian doctrine and political and economic theory. Understanding of the origins of a largely Christian, republican, and capitalist America. [3] Staff. (Not currently offered)

289. History of American Thought since 1865. Basic beliefs and preferences, with special emphasis upon Darwinian theory, the physical sciences, classic American philosophers, and the various and confusing intellectual fashions of the twentieth century. [3] (Not currently offered)

291. History of American Enterprise. (Also listed as Economics 245.) 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. FALL, SPRING. [3] Carlton, Olegario.

294. Selected Topics in History. SPRING. [3] Staff.

300a–300b. Introduction to Historical Methods and Research. [4–4] Usner, Smith.

301. The Art and Craft of Teaching History. Readings on pedagogical theory and current research on college-level teaching and learning. Hands-on exercises in course design, preparing and grading tests and assignments, lecturing, leading discussion, cooperative and service learning, and use of technology to enhance teaching. Normally limited to graduate students in History. FALL. [4] Eakin.

305. Studies in Comparative History. SPRING. [4] Blackett, Eakin.

309. Studies in the Philosophy of History. [4] (Not currently offered)

315a. Studies in Early Modern European History. [4] (Not currently offered)

317. The Long Reformation in Britain and America. Perceptions of Protestantism in post-Reformation England, Scotland, Anglo-Ireland, the Gaidhealtachd, and the British American colonies. Anthropology of religion and ritual; recent secondary historical literature; spiritual autobiographies, diaries, church court records, sermons. Optional instruction in early modern paleography. [3] (Not currently offered)

320a. Studies in European History, 1815–1914. FALL. [4] Epstein.

321. Topics in European History. [4] (Not currently offered)

324a. Studies in Recent European History. [4] (Not currently offered)

330a. Studies in German History. SPRING. [4] Smith.

340. Urban History. Theoretical approaches to the dynamics of urban life in different historical times and places. Topics of special interest include rural-urban linkages; merchants and the state; plebeian culture and patrician society; the languages of class and gender; the myths and rituals of marginality; race and ethnicity; and global metropolitanism. [4] (Not currently offered)

343a. Studies in Early Modern Britain. Readings on England, Scotland, and Ireland from 1450 to 1700, with emphasis on England and on politics, political theory, religion and culture. [4] (Not currently offered)

343b. Seminar in Early Modern Britain. Research and writing on England and Scotland from 1500 to 1700; introduction to early modern paleography. [4] (Not currently offered)

344a. Studies in Modern England. [4] (Not currently offered)

344b. Seminar in Modern England. [4] (Not currently offered)

350a–350b. History of Biography. A two-semester sequence course. Fall: art of biography; autobiography and biography; examination and analysis of major works in the nineteenth and twentieth century biography. Spring: entire semester devoted to the projection of a major biographical essay. [4] (Not currently offered)

358. Comparative Slavery in the Colonial Americas. Interdisciplinary and cross-cultural study of slavery and resistance in Spanish, British, French, Dutch, and Portuguese America. Does not cover antebellum slavery in the United States. [4] Landers. (Not currently offered)

359. Atlantic World History, Fifteenth to the Nineteenth Century. Interdisciplinary readings examining disparate colonizations and the creation of an Atlantic world system. Major themes include the consequences of Atlantic expansion on indigenous societies, the African slave trade, and the rise of Atlantic economics, the circulation of peoples, ideas, and material culture throughout the Atlantic and how imperial competition, political ideologies, and subaltern resistance shaped the Atlantic revolutions. Optional instruction in early modern paleography. [4] Landers. (Not currently offered)

360. Studies in Imperialism and the Colonial Other. The focus will be on representations of the other in European and American literary, cultural, and historical discourses; historical conditions that have produced various images of the colonial other, and recent criticisms of imperial colonial conditions. [4] (Not currently offered)

361. Topics in Latin American History. FALL. [4] Wright-Rios.

362. History of Gender and Women in Colonial Latin America. Interdisciplinary and cross-cultural study of the history of gender and its impact on Spanish, Indian, and African women in colonial Latin America. Major topics include gender and family roles, women's work and economy, legal and social statuses of distinct groups of women and related issues of social control, and the religious and public lives of women. [4] Landers. (Not currently offered)

365. Seminar in Latin American History. [4] Landers. (Not currently offered)

369. Master's Thesis Research. [0]

371a. Studies in Early American History to 1783. [4] Usner. (Not currently offered)

372a. Studies in the Middle Period of American History, 1783–1861. [4] (Not currently offered)

373a. Studies in U.S. History, 1861–1900. [4] Dickerson. (Not currently offered)

374. Studies in Recent American History. SPRING. [4] Fergus.

375. Seminar in Recent American History. [4] Dickerson. (Not currently offered)

378a. Studies in the History of the South. [4] Carlton. (Not currently offered)

380a. Studies in American Diplomatic History. SPRING. [4] Schwartz.

381. Topics in American History. FALL. [4] Dickerson.

384a. Studies in American Social History. [4] (Not currently offered)

384b. Seminar in American Social History. [4] (Not currently offered)

385a–385b. Studies in the Intellectual History of the United States. [4–4] (Not currently offered)

386a. Studies of Women in the United States. [4] (Not currently offered)

390a–390b. Independent Study. [Variable credit: 1–3 each semester]

398. Dissertation Seminar. FALL, SPRING. [3] Tuchman, Olegario.

399. Ph.D. Dissertation Research. FALL, SPRING. [3] Tuchman, Olegario.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

History of Art

CHAIR Christopher M. S. Johns
DIRECTOR OF GRADUATE STUDIES Leonard Folgarait
PROFESSORS EMERITI Robert A. Baldwin, Thomas B. Brumbaugh, F. Hamilton Hazlehurst, Milan Mihal, Ljubica D. Popovich
PROFESSORS Leonard Folgarait, Vivien Green Fryd, Christopher M. S. Johns
ASSOCIATE PROFESSORS Robert L. Mode, Barbara Tsakirgis
ADJUNCT ASSOCIATE PROFESSOR Susan Edwards
ASSISTANT PROFESSORS James J. Bloom, Annabeth Headrick, Jinah Kim, Tracy Miller, Elizabeth J. Moodey
LECTURER Claire S. King

DEGREE OFFERED:
ART HISTORY. *Master of Arts*

THE faculty in art history gives special attention to breadth of coverage and period continuity. Both Western and non-Western traditions are included, with particular emphasis on medieval to baroque art and early modern to contemporary art in Europe and America. A research collection, the Contini-Volterra Archive, is housed in the library and contains thousands of photographs presenting a thorough documentation of painting in Italy and elsewhere from the thirteenth through the eighteenth centuries.

The department stresses the interrelationship of history, anthropology, classics, philosophy, religion, and many of the social sciences. Members of the faculty represent different approaches to the field, encouraging diversity in the art history graduate program. For courses in other departments that might be appropriate (such as Classics 203, 204, 205, 206, and/or 217), check with the director of graduate studies. Students must take 30 credit hours, pass foreign language exams in German plus area of concentration, and write a thesis.

210. Early Christian and Byzantine Art. The development of architecture, sculpture, painting, and the minor arts from the fourth through the fifteenth century. [3] (Not currently offered)

211. Medieval Art. The development of architecture, sculpture, painting, and the minor arts in Europe from the eighth through the fourteenth century. FALL. [3] Moodey.

212. Northern Renaissance. Painting, sculpture, and graphic arts in the Low Countries, France, and Germany from the end of the fourteenth century through the Reformation. Historical, social, and religious factors are considered as well as style. FALL. [3] Bloom.

215. Formation and Power of Christian Images. Iconographic analysis of the origins and evolution of single figures and compositions: their religious and political messages in painting and sculpture of the Middle Ages from circa 300 to 1300. [3] (Not currently offered)

218. Italian Renaissance Art to 1500. Early development of painting and sculpture through the fourteenth century and into the full Renaissance style of Italian art, as manifest in the works of Giotto, Masaccio, Donatello, and Botticelli. Emphasis is placed on the age of the Medici. FALL. [3] Mode.

219. Italian Renaissance Art after 1500. 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. SPRING. [3] Mode.

220. Renaissance-Baroque Architecture. European architecture from the fifteenth century to the French Revolution, with emphasis on its historical and social background. The various architectural movements—Renaissance, Baroque, and Rococo—are studied in terms of important architects and buildings, especially of Italy, France, and England. [3] (Not currently offered)

221. Baroque-Rococo Art. European painting from 1550 to the French Revolution, encompassing the Mannerist, Baroque, and Rococo movements as they are manifested in the works of Caravaggio, Velasquez, Rembrandt, Watteau, Hogarth, and Tiepolo. [3] Johns, Bloom. (Not currently offered)

222. British Art. The arts of England and related cultures, from Van Dyck and Hogarth to Blake and the Pre-Raphaelites. Social and political context, literary influences, and film treatments. SPRING. [3] Mode.

224. Eighteenth-Century Art. 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] Johns. (Not currently offered)

226. Neoclassicism and Romanticism. 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] Johns. (Not currently offered)

230–231. Nineteenth- and Twentieth-Century European Art. A survey of painting and the graphic arts, with some consideration given to social and historical factors. 230: from Neo-Classicism through Post-Impressionism; 231: from the early expressionist movements to midcentury. FALL, SPRING. [3–3] Folgarait, Staff.

232. Modern Architecture. 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] Folgarait. (Not currently offered)

234. Twentieth-Century Mexican Literature, Film, and Art. The historical, social, and political dynamic as expressed in various art forms. The relation between social reality and aesthetic form. [3] Folgarait. (Not currently offered)

240. American Art to 1865. Painting, sculpture, and architecture of the United States from Colonial times to 1865 with emphasis on iconography, social history, race, and gender. FALL. [3] Fryd.

241. American Art 1865 to 1945. 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] (Not currently offered)

242. Art since 1945. A survey of art produced in the United States and Europe since 1945 with emphasis on theory and social and intellectual factors. SPRING. [3] Fryd.

251. East Asian Architecture and Gardens. 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. FALL. [3] Miller.

252. Arts of China. Artistic production from the Neolithic period through the Zing dynasty in relation to religious and cultural contexts. FALL. [3] Miller.

253. Arts of Japan. Artistic production from the Neolithic through Meiji periods in relation to religious and cultural contexts. SPRING. [3] Miller.

254. Japanese Painting and Prints. A survey of Japanese painting from the protohistoric period to the present, with an emphasis on schools, styles, and development of woodblock prints, as seen in their historical, religious, and cultural context. [3] Miller. (Not currently offered)

255. Native North American Art. The art and great aesthetic traditions of the native peoples, emphasizing North America, including the Southwest, Northwest Coast, and the Plains. The relationship of art to social life, myth, and religion. Changes since contact with European cultures. SPRING. [3] Headrick.

256. Art of the Maya. Architecture, painting, and sculpture from 100 B.C. to artistic traditions of contemporary Maya peoples. Ritual, religion, mythology, and politics. SPRING. [3] Headrick.

257. Mesoamerican Art. Worldview as expressed by painting, sculpture, and architecture from 2000 B.C. through the sixteenth century. Impact of religion and politics on the cities of the Olmec, Zapotec, and Aztec as seen through their artistic traditions. FALL. [3] Headrick.

288. Selected Topics. May be repeated with change of content up to a total of 9 hours. [3] Staf.

289. Independent Research. Supervised work in extension of regular offerings in the curriculum. Registration only with agreement of instructor involved. FALL, SPRING. [Variable credit: 1–3 per semester; not to exceed a total of 6] Staff.

290. Directed Study. Supervised participation in research. FALL, SPRING. [Variable credit: 1–3 per semester, not to exceed a total of 6] Staff.

301. The Methods of Art History. Comparative analysis of art historical methods including social history, post-structuralism, feminism, gender studies, stylistic analysis, and iconography. Assessment of methods in action through critiques and exercises in independent application. [3] Folgarait, Fryd. (Not currently offered)

310. Seminar: Issues in Asian Art. [3] Miller. (Not currently offered)

312. Seminar: Problems in Medieval Architecture. [3] (Not currently offered)

315. Seminar: Early Renaissance Art. [3] Mode. (Not currently offered)

319. Seminar: Problems in Baroque Art. [3] Johns, Bloom. (Not currently offered)

320. Seminar in British Art and Culture. [3] Mode. (Not currently offered)

321. Problems in Eighteenth-Century Art. [3] Johns, Mode.

324. Seminar: Studies in Twentieth-Century Art. [3] Folgarait. (Not currently offered)

325. Seminar: Studies in American Art. [3] Fryd. (Not currently offered)

355. Seminar: Mesoamerican Art. [3] Headrick. (Not currently offered)

369. Master's Thesis Research. FALL, SPRING. [0–6] Staff.

Human Genetics

DIRECTOR Scott M. Williams
DIRECTOR OF GRADUATE STUDIES Scott M. Williams
PROFESSORS Judy Aschner, Michael Aschner, H. Scott Baldwin, Randy D. Blakely, Kendal Broadie, Ellen Wright Clayton, James Crowe, Ellen Fanning, Sergio Fazio, Al George, Jonathan L. Haines, Pat Levitt, Macrae Linton, David McCauley, John A. Phillips III, Dan Roden, Arnold Strauss
ASSOCIATE PROFESSORS Thomas Aune, Ela Knapik, James Patton, Lilianna Solnica-Krezel, Marshall Summar, James S. Sutcliffe, George Tiller, Scott M. Williams, Laurence J. Zwiebel
ASSISTANT PROFESSORS Jeff Canter, Katherine Friedman, Rizwan Hamid, Tsutomui Kume, Chun Li, Douglas Mortlock, Deborah Murdock, Richard Nass, Marylyn D. Ritchie, Michelle Southard-Smith, Jeffrey Smith

DEGREE OFFERED: *Doctor of Philosophy*

❧ THE overall goal of the Human Genetics Ph.D. degree program is to provide students with a solid foundation for a career in genetics research and teaching. Training is available in human genetic analysis and in genetic analysis of model systems that contribute to our understanding of human disease. The training combines a prescribed set of basic courses intended to ground students in the fundamentals of genetic analyses, the basics of human genetics, a set of elective courses designed to meet individual needs, and a rigorous research experience that will contribute to the field of genetics. Students completing the requirements of the Ph.D. program in Human Genetics will have demonstrated mastery of knowledge in genetics and contributed substantial and original scientific knowledge to the field.

Ph.D. students in Human Genetics are required to complete a minimum of 29 credit hours of formal course work, consisting of 23 hours of required course work and 6 hours of electives. One of the required courses will be a statistics course to be chosen from several currently available on campus and approved by the program faculty. Students will take a minimum of 6 hours of didactic classes per semester during their first two years of study. It is expected that during the second year at least one semester will exceed this minimum in order to complete the required courses prior to year 3 of study. The electives come from an approved list of advanced genetics courses and the choice of these courses will be based on the individual student's research interests.

Students may take one of two paths in their training. These paths diverge in the spring semester of the second year when it is expected that students who are more focused on population and/or statistical genetics will opt for courses that emphasize statistical and population approaches and students more interested in functional studies will take courses that emphasize molecular genetics/genomics.

For additional information, see *http://chgr.mc.vanderbilt.edu/chgrsite/PhD.htm*.

320. Human Genetics. Research/techniques in human genetics. By arrangement. [Variable credit]

340. Human Genetics I. Designed to cover background and latest advances in human genetics. Topics will include an overview of mutational mechanisms, cytogenetics (detection and description of chromosomal abnormalities), biochemical genetics (gene defects in biochemical pathways), molecular genetics (gene structure, function, and expression), population genetics (heritability, quantitative traits, variance analysis), disease gene discovery (study design, statistical and molecular techniques), and genetic epidemiology (genetic linkage analysis, association studies, gene-gene and gene-environment interaction). Topics will be discussed with reference to specific human genetic diseases. FALL. [3] Summar and Staff.

341. Human Genetics II. This course will cover the statistical, population, and analytical aspects of modern human genetics research. Topics to be covered include human population genetics, quantitative genetics, linkage and association analyses, computational genetics, and evolutionary genetics. Clinical examples, subject ascertainment, and study design will also be emphasized. Students must have a strong understanding of Mendelian genetics and basic biostatistics. Prerequisite: permission of instructor. SPRING. [3] Haines and Staff.

349. Genetics of Model Organisms. Basic genetic principles across a broad range of organisms (yeast, C. elegans, Drosophila, Arabidopsis, mouse, zebrafish) that are used to investigate molecular and developmental pathways of interest for human disease will be presented. This course focus will provide students with in-depth terminology and understanding of the advantages, applications, and approaches specific to each organism. Genomic and bioinformatics tools that facilitate genetic analysis in each species will be emphasized. Specific examples of how each model organism has successfully contributed to defining a human disorder will be presented. Course combines faculty lectures with discussion of original articles and hands-on computer time for demonstration of statistical packages. SPRING. [2] Southard-Smith and Staff.

370. Tutorials in Human Genetics. A weekly seminar critically evaluating current and past scientific literature from many areas of genetic research. The focus will be on study methods and analysis. FALL. [1] Canter.

371. Tutorial in Statistical and Population Genetics. The class meets once weekly. Graduate students critically evaluate research publications in areas statistical methods in human genetic analysis and in the area of human population genetics. Also, there are faculty presentations on ancillary science skills, such as oral and poster presentations, and grant and proposal writing. SPRING. [1] Li, Ritchie.

385. Fundamentals of Genetic Analysis. This course is designed to accomplish three goals: (1) introduce students to critical topics of genetic research, (2) introduce students to important areas of genetic research not covered in first-year course work, and (3) promote an understanding of classical genetic analysis by learning genetics using the original literature. The approach will be to use classic literature that defined significant problems in genetic research. Specific topics will include: genetic analysis (segregation, independent assortment and locus mapping), human pedigree analysis and disease gene mapping, and population/quantitative genetics. FALL. [4] Williams and Staff.

399. Ph.D. Dissertation Research. [Variable credit] Staff.

Earth and Environmental Sciences

CHAIR David J. Furbish
DIRECTOR OF GRADUATE STUDIES John C. Ayers
PROFESSORS EMERITI Leonard P. Alberstadt, Arthur L. Reesman, William G. Siesser, Richard G. Stearns
PROFESSORS David J. Furbish, Calvin F. Miller, Molly Fritz Miller
ASSOCIATE PROFESSOR John C. Ayers
ASSISTANT PROFESSORS Steven Goodbred, Kaye S. Savage
SENIOR LECTURERS Brendan Bream, Jonathan M. Gilligan
LECTURER N.Kinzly Moore

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*
(option in Environmental Science offered jointly with Environmental Engineering)

A STUDENT earns the master's degree in earth and environmental sciences by completing 24 hours of formal course work and submitting an approved research thesis. Fields of study include sedimentology, geochemistry, Quaternary geology, tectonics, oceanography, igneous and metamorphic petrology, environmental geology, and paleoecology. Graduate students in earth and environmental sciences must obtain permission from the department to receive credit for any course required for the undergraduate major: 220, 225, 226, 230, 240. Graduate students in other disciplines may receive credit for these courses. Six hours of graduate credit is required in another discipline or in an area of earth and environmental sciences other than that in which the student is pursuing thesis research.

220. Life Through Time. Ecology, classification, evolutionary history 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: 101 or junior standing as a biological sciences major. No credit for graduate students in EES. FALL. [4] M. Miller.

225. Earth Materials. 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: 101 or 104. FALL. [4] C.Miller.

226. Petrology. 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: 225. No credit for graduate students in EES. SPRING. [4] Ayers.

230. Sedimentology. 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: 225 or 226. No credit for graduate students in EES. SPRING. [4] Goodbred.

240. Structural Geology and Rock Mechanics. Principles of rock deformation; mechanics, fractures, folds, foliation, primary structures. Field trips. Three lectures and one laboratory period per week. Pre- or corequisite: 226. No credit for graduate students in EES. SPRING. [4] Staff.

257. Hydrogeology. An introduction to hydrogeology with emphasis on distribution, movement, and chemistry of groundwater. Principles of groundwater flow, water chemistry, and geology related to exploration, evaluation, development, and protection of groundwater resources. Prerequisite: 225 and one semester each of chemistry, physics, and calculus. FALL. [3] Savage.

258. Environmental Geochemistry. Concepts, principles and models of chemical processes operating at or near the earth's surface. Thermodynamics, kinetics, organic and isotope geochemistry, environmental mineralogy. Application of concepts to environmental problems. Prerequisite: 225 and Chemistry 102a–102b. FALL. [3] Ayers.

260. Geochemistry. 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: 225 and Chemistry 102a–102b, or consent of instructor. FALL. [3] Ayers.

261. Geomorphology. 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. Prerequisite: 101 and junior standing in natural science, anthropology, or engineering. SPRING. [3] Furbish.

262. Geochemistry Laboratory. Laboratory to accompany 258 or 260. Corequisite: 258 or 260. One three-hour laboratory per week. FALL. [1] Staff.

264. Methods in Environmental Geology. Field, laboratory, and analytical methods in geological and environmental investigations. Chemical and physical principles of analytical instrumentation; analysis and reliability of instrumental measurements. Laboratory and field projects; sample collection; field measurements; chemical/spectroscopic analysis. Prerequisite: junior standing, 225 and previous or concurrent in 257 or 260. SPRING. [3] Savage.

279. Problems in Sedimentology and Paleobiology . Relation between past life and its environment as recorded in sedimentary rocks. Emphasis on reconstructing the depositional environment and the ancient communities recorded in Paleozoic sedimentary sequences in Tennessee, and investigating recent research on the interplay between ecosystems and physical environment during critical periods of earth history. Prerequisite: 220 and 226. FALL. [3] M. Miller.

289a–289b. Directed Study. 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. FALL, SPRING, SUMMER. [Variable credit: 1–2 each semester] Staff.

291a–291b. Independent Study. 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. FALL, SPRING. [Variable credit: 2–3 each semester] Staff.

292a–292b. Senior Honors Resear ch. Independent research under faculty supervision culminating in an oral presentation and written thesis submitted to the faculty. Open only to honors candidates. Does not count towar d minimum r equirements for the major . FALL, SPRING. [Variable credit: 2–3 each semester] Staff.

315. Igneous Petrochemistry and Petrogenesis. Application of phase equilibria and trace element and isotope chemistr y to interpr etation of the origin and histor y of igneous r ocks and to large-scale geological problems to which magma genesis is relevant. Problem solving based upon geochemical data emphasized. Pr erequisite: general chemistry, and analytic geometry and calculus, and GEOL 226, or Chemistry 230. SPRING. [3] C. Miller.

320. Aqueous Geochemistry. The chemistry of subsur face waters, including near -surface groundwaters, oreforming solutions, and metamorphic and igneous fluids. Quantitative analysis of mineral-fluid equilibria using thermodynamics and phase diagrams. Role of aqueous fluids in heat and mass transpor t, chemical r eactions in r ocks, and geochemical cycles. Prerequisite: general chemistry, and GEOL 260 or physical chemistry. FALL. [3] Ayers.

325. Environmental Applications of Geochemical Modeling. Computer-based modeling of geochemical processes. Model types include aqueous speciation and solubility , surface adsorption, reaction paths, inverse mass balance, kinetic and coupled r eactive transport. Application to environmental problems including surface water chemistry, groundwater transport, subsurface waste storage, acid mine drainage, and deep well injection. Prerequisite: 258 or 260. SPRING. [3] (Alternate years) Ayers.

369. Master's Thesis Research.

390. Special Topics and Advanced Techniques in Geology. [Variable credit: 2–4]

East Asian Studies

DIRECTOR Gerald Figal

Affiliated Faculty

RESEARCH PROFESSOR James Auer (Center for U.S.–Japan Studies, VIPPS)
ASSOCIATE PROFESSORS Gerald Figal (History), Yoshikuni Igarashi (History), James J. Lang (Sociology), Ruth Rogaski (History)
ASSISTANT PROFESSOR Tracy Miller (History of Art)
SENIOR LECTURERS Xianmin Liu (Chinese), Peter Lorge (History), Keiko Nakajima (Japanese)
LECTURERS Qing Wei (Chinese), Mine Yoshizawa (Japanese)

A NUMBER of courses are available in East Asian languages, social sciences, and humanities, from which a field of minor concentration may be constructed, subject to approval of the student's adviser.

A partial listing of r elevant courses follows. See departmental listings for courses offered in the current academic year.

The members of the Committee on East Asian Studies ar e James Auer (*Center for U.S.-Japan Studies, VIPPS*), Yoshikuni Igarashi *(History),* James J. Lang (*Sociology*), Xianmin Liu (*Chinese*), Peter Lorge (*History*), Tracy Miller (*History of Art*), and Keiko Nakajima (*Japanese*).

CHINESE: 201–202, Elementary Chinese; 214–216, Intermediate Chinese; 231, Chinese Calligraphy; 241–242, Advanced Chinese; 251–252, Intensive Readings in Chinese.

HISTORY: 248, China in Revolution; 249, History of Modern Japan; 250, Cultural and Social History of Japan's Recent Past; 251, Popular Culture in Early Modern Japan.

HISTORY OF ART: 200, Asian Art; 252, Chinese Art; 253, Japanese Art; 254, Japanese Painting and Prints.

JAPANESE: 201–202, Beginning Modern Japanese; 211–212, Intermediate Modern Japanese; 241–242, Third Year Japanese.

POLITICAL SCIENCE: 214, The Japanese Political System; 216, The Chinese Political System (Not currently offered).

RELIGIOUS STUDIES: 231, Women in Buddhist Traditions; 244, Buddhist Traditions; 249, Zen Buddhism (Not currently offered).

Economics

CHAIR Eric Bond
VICE CHAIR Peter L. Rousseau
DIRECTOR OF GRADUATE STUDIES Gregory Huffman
DIRECTOR OF THE GRADUATE PROGRAM IN ECONOMIC DEVELOPMENT
Andrea Maneschi
PROFESSORS EMERITI Rendig Fels, T. Al Finegan, C. Elton Hinshaw, Cliff J. Huang, Clifford S. Russell, Gian Sabota, Anthony M. Tang, William G. Thweatt, Fred Westfield
PROFESSORS Kathryn H. Anderson, Jeremy Atack, Eric Bond, John Conley, William W. Damon, Andrew F. Daughety, Robert A. Driskill, Benjamin Eden, Yanqin Fan, James E. Foster, Gregory Huffman, Tong Li, Andrea Maneschi, Robert A. Margo, Jennifer F. Reinganum, John J. Siegfried, Quan Wen, John A. Weymark, Myrna Wooders
ASSOCIATE PROFESSORS William J. Collins, Mario Crucini, Malcolm Getz, Kevin X. D. Huang, Peter L. Rousseau, George H. Sweeney
ASSISTANT PROFESSORS Christian Ahlin, Mototsugu Shintani, Diana N. Weymark, Benjamin Zissimos

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

❧ GRADUATE study in economics at Vanderbilt prepares students for research and teaching careers in universities and for planning and leadership positions in government, international agencies, and business. The curriculum emphasizes applications of economic theory. Participation in research projects, in joint seminars, and in informal research workshops assures close student-faculty interaction. Students have been attracted to the program from all parts of the United States and from more than sixty countries. Graduate programs are offered in economics but not in business administration. Students interested in graduate work in business administration should apply to the Owen Graduate School of Management.

A master's degree (without thesis) may be awarded after completion of 42 hours of Ph.D. course work with an average of at least *B* or better.

For the Ph.D. degree, which requires 72 hours, the student normally takes at least 51 hours of formal course work, including required courses in economic history or history of economic thought, statistics, and econometrics, along with courses in microeconomic theory and macroeconomic theory. Economics courses in this catalog numbered below 250 and the business administration courses listed below are available for minor credit in other graduate programs. There is a mathematics requirement, normally satisfied by taking Economics 300, Selected Topics in Mathematics for Economists. There is no foreign language requirement.

The faculty requires that all doctoral students, before undertaking the qualifying examination, pass written examinations in economic theory (micro and macro) and in one major elective field chosen from the following: advanced economic theory, econometrics, economic growth and development, economic history, finance, industrial organization, international economics, labor, money, and public finance. A second field chosen from that list may be completed by either passing a written examination or by passing two courses in this field numbered above 300 with a grade of *B* or better in each course. A second field in which the department offers only one course above 300 or a field requested by petition must be passed by written examination. Each year the department offers a variety of graduate-level courses beyond the core.

All students entering the Ph.D. program are expected to take a competence test in mathematics measuring knowledge of elementary mathematics. It is highly desirable that each entering student have completed one year of calculus and courses in intermediate microeconomic and macroeconomic theory, statistics, and linear algebra.

Detailed information is available on request from the department.

Graduate Program in Economic Development

Students may be interested in the Graduate Program in Economic Development, a more professionally oriented degree program. Students take courses in economic theory and statistics and in such areas as economic development, international trade, and monetary and fiscal policies, and can earn a master of arts degree. This program is described under Special Programs.

Economics

222. Latin American Economic Development. Recent economic growth and structural change of Latin American economies. The general issues of development economics will be explored, such as the mobilization of savings and capital formation, import-substituting industrialization, inflation, agricultural reform, regional and national economic integration, population growth and migration, and balance-of-payments problems. No credit for graduate students in economics. SPRING. [3] Andrade.

231. Intermediate Microeconomic Theory. 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. No credit for graduate students in economics. Prerequisite: one semester of calculus. FALL, SPRING. [3] Conley, Schwartz; Conley, Foster.

232. Intermediate Macroeconomic Theory. National income accounting and analysis. Classical, Keynesian, and contemporary models determining national income, employment, liquidity, price level, and economic growth. No credit for graduate students in economics. Prerequisite: one semester of calculus. FALL, SPRING. [3] Crucini, Weymark; Ahlin, Huffman.

251. Wages, Employment, and Labor Markets. Theories of wages and employment, dual labor markets, internal labor markets, and labor's share of national income. Empirical studies of labor mobility, the effects of unions on relative wages and resource allocation, occupational and industrial wage differentials, and selected labor markets. Prerequisite: 150, Statistics, and 231, or consent of instructor. [3] (Not currently offered)

252. Antitrust Economics. The purposes and effects of antitrust laws in the United States. Economic theory applied to the problems of preserving and enhancing competition. Evaluation of incentives created by judicial precedents in terms of efficiency and performance. Prerequisite: 231. [3] (Offered 2007/2008)

253. Introduction to Econometrics. Quantitative methods of economic analysis. Measurement, specification, estimation, and interpretation of economic models, introduction to econometric computation using microcomputers. No credit for graduate students in economics. Prerequisite: 231 and either 150 or Math 218 and 218L. FALL. [3] Fan.

254. Public Finance. 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: 231 or equivalent. SPRING. [3] Foster.

259. Financial Instruments and Markets. 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: 231, 232. FALL. [3] Kim.

FnEc261. Investment Analysis. Investment principles and practices. Emphasis on security analysis to develop techniques and standards of investment appraisal. Principles of portfolio analysis. The forecasting problem in meeting portfolio needs of individuals and institutions. Special studies to develop capacity for investigating and reporting. Prerequisite: 150 and 240. FALL, SPRING. [3] C. Clark.

262. History of Economic Thought. Evolution of economic ideas from the ancient Greeks to the contemporary world with attention to the seminal thoughts of Adam Smith, David Ricardo, J. S. Mill, Alfred Marshall, and J. M. Keynes. Prerequisite: 231 and 232. SPRING. [3] Maneschi.

263. International Trade. 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. Prerequisite: 231. FALL, SPRING. [3] Driskill; Hutchinson, Ketkar.

264. Open Economy Macroeconomics. Economics of international monetary, financial, and macroeconomic relationships. Effects of monetary and fiscal policies in open economics, balance of payments, exchange rate determination, and international monetary institutions. Prerequisite: 232. FALL, SPRING. [3] D. Weymark.

265. Macroeconomic Models for Policy Analysis. 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: 232. [3] (Offered 2007/2008)

266. Problems in United States Economic History. Analysis of major issues and debates in American economic history. Prerequisite: 231. SPRING. [3] Hutchinson.

267. Economics of Poverty and Discrimination. Develops methodologies used to measure the effectiveness of governmental programs aimed at reducing poverty and discrimination, and uses these methodologies to examine the equity and efficiency of current programs. Topics include social security, food stamps, and equal employment opportunity legislation. Prerequisite: 231 or consent of instructor. [3] (Not currently offered)

268. Economics of Health. An examination of some of the economic aspects of the production, distribution, and organization of health care services, such as measuring output, structure of markets, demand for services, supply of services, pricing of services, cost of care, financing mechanisms, and their impact on the relevant markets. Prerequisite: 231. FALL, SPRING. [3] So.

269a–269b. Selected Topics in Economics. Topics of special interest, as announced in the *Schedule of Courses*. FALL, SPRING. [3] C. Huang, Eden.

270. Economics of Sports. Application of economic principles to professional and collegiate team sports. Theory of sports leagues, demand for sports, the market for athletes, racial discrimination, broadcasting rights, antitrust issues. No credit for both 270 and 280. Prerequisite: 150 and 231. [3] (Not currently offered)

271. Economic History of Europe. The stages of development of capitalism and modern industry in Europe since the decline of feudalism. The interrelation of government policy, financial institutions, scientific discovery, and the spirit of individualism. Prerequisite: 231. [3] (Not currently offered)

273. Game Theory with Economic Applications. 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: 231. FALL. [3] Wooders.

274. Industrial Organization. The structure of contemporary industry and the forces that have shaped it, including manufacturing, trade, and transportation. The role of the large corporation in modern industrial organization. The relation of industrial structure to economic behavior and performance. Prerequisite: 231. FALL. [3] Reinganum.

FnEc 275. Financial Management. (Formerly Business Administration 275) Analysis of cases representing capital budgeting, forecasting cash flow, risk assessment, capital structure, mergers and acquisitions. Seminar. Prerequisite: 240. FALL, SPRING. [3] Damon.

278. The Technical Basis for Environmental Policy. (Also listed as Civil Engineering 278 and Management of Technology 278). The engineering and economic foundations of environmental policy formation, mathematical computer modeling of the environment, and economic valuation of environmental quality. Treatment and site clean-up processes, fundamental equations of environmental engineering, the notion of market failure, and economics of monitoring and enforcement. [3] (Not currently offered)

279. Urban Economics. Urban growth, the development of suburbs, the location of firms, housing markets, transportation, property taxes, and local government services. Prerequisite: 231. SPRING. [3] Getz.

280. Seminar in Sports Economics. Economic theory of sports leagues: competitive balance, player labor markets and owner capital markets. Theories of league expansion, rival leagues, franchise relocation, and sports venues. Research paper. No credit given for both 280 and 270. Preference given to senior majors. Prerequisite: 231. FALL, SPRING. [3] Vrooman.

282. Education and Economic Development. The influence of education on economic growth and development in developing countries. Theory and measurement of economic growth and human capital. Distributional and efficiency effects of human capital policies. Influence of international organizations on human capital development. Education and social cohesion. Prerequisite: 231 and 150 or consent of instructor. SPRING. [3] Anderson.

283. Economics of the Environment. Economic theory and analytic tools involved in selected environmental problems: air and water quality and hazardous waste management. Prerequisite: 231. [3] (Not currently offered)

285. Law and Economics. Analysis of the influence of legal rules and institutions on the behavior of individuals and on economic efficiency and equity. Applications from civil procedure, contract, tort, and criminal law. Prerequisite: 231. SPRING. [3] Daughety.

286. Economics of Human Resources. Human capital theory: economic effect of population trends, fertility, and migration. Additional topics chosen from education, household economics, health, nutrition, demand for children and child care, sex and race discrimination, crime, investment in research and development, the economic value of life and time. Prerequisite: 231 or 233 and 201, Statistics, or consent of instructor. [3] (Not currently offered)

287. European Economic Integration. Policy issues concerning economic integration in Europe, including trade, migration, income distribution, environmental quality, macroeconomic policy, and monetary union. Analysis of European Community institutions. Prerequisite: 231; corequisite: 232. [3] (Not currently offered)

288. Development Economics. 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: 150 and 231. FALL. [3] Ahlin.

300. Selected Topics in Mathematics for Economists. Selected mathematical topics used in the analysis of static and dynamic models. Prerequisite: one year of calculus (Math 171a–171b, Analytic Geometry and Calculus, or equivalent). FALL. [3] Wen.

301. Microeconomic Theory (M.A. Level). The price system in consumer demand and as a mechanism for organizing production, allocating resources, and distributing the national income. FALL. [3] Wen.

302. Macroeconomic Theory (M.A. Level). National income accounting. Theories of income, employment and price determination. Growth and planning models. Monetary theory. SPRING. [3] Driskill.

304a. Microeconomic Theory I. Analysis of resource allocation and relative prices. Behavior of individual economic units and markets. Topics include models of technology, cost and profit and the firm; consumer preferences, constraints and choice; expected utility theory and risk aversion; partial equilibrium under competition and monopoly; partial equilibrium welfare and surplus. FALL. [3] Daughety.

304b. Microeconomic Theory II. Noncooperative game theory, information economics, public goods and an introduction to general equilibrium models. Topics include Nash equilibrium, sequential rationality, incomplete information; oligopoly; bargaining; adverse selection, signaling and screening; principal-agent models; externalities and public goods; introductory general equilibrium and welfare analysis. SPRING. [3] Wooders.

304c. Microeconomic Theory III. General equilibrium, social choice and welfare. General equilibrium, existence, stability and uniqueness results; fundamental theorems of welfare; core and equilibria; general equilibrium with time and uncertainty; social choice theory and mechanism design; axiomatic bargaining and welfare. No credit for students who have completed former 331. FALL. [3] Conley.

305a. Macroeconomic Theory I. Keynesian and neoclassical models of the economy. Introduction to dynamic models. FALL. [3] Huffman.

305b. Macroeconomic Theory II. Neoclassical and new theories of economic growth. Overlapping generations models. SPRING. [3] Eden.

305c. Macroeconomic Theory III. Theories of consumption, investment, demand and supply of money, the labor market. Monetary and fiscal policy. New Keynesian economics. The role of expectations. No credit for students who have completed former 376. SPRING. [3] Crucini.

306. Statistical Analysis (M.A. Level). Interpretation of statistical materials, the principles of statistical inference, the use of available statistics for problems of economic analysis, and the importance of statistics in economic policy and administration. FALL. [3] C. Huang.

307. Statistical Analysis. Statistical methods applicable to quantitative research in economics and business. Distribution theory, statistical inference, and selected multivariate statistical methods. Prerequisite: 201, Statistics, or equivalent. FALL. [3] Shintani.

308. Econometrics (M.A. Level). Empirical measurements with applications to basic economic relations. Specification, estimation of microeconomics and macroeconomics models for the purpose of testing hypotheses, forecasting, and evaluating policy. Prerequisite: 306. SPRING. [3] C. Huang.

309. Econometrics. Analysis of specification errors in single equation estimation of economic relations and introduction to the estimation and application of simultaneous equation models. Prerequisite: 307 or consent of instructor. SPRING. [3] Fan.

312a–312b. Health Economics. Conceptual and empirical analysis of demand for health, medical services, and insurance; decisions by physicians and hospitals about price, quantity, and quality of services; technological change; and structure and performance of the pharmaceutical industry. [3–3] (Not currently offered)

316. International Trade Theory. Classical, neoclassical, and contemporary theories of international trade; empirical evidence for them. Commercial policy, tariffs, the terms of trade and income distribution, international factor movements: economic unions. Trade and growth. Trade and welfare. SPRING. [3] Bond.

317. International Monetary Economics. The balance of payments and the foreign exchange market. Elasticities, absorption, and monetary approaches to the adjustment mechanism. Interest rates and capital flows. Optimal currency areas, internal and external balance. International reserves and liquidity. FALL. [3] Crucini.

320a–320b. Seminar in the Organization and Control of Industry. The structure of American industry; the origins and development of industrial concentration; the behavior and performance of oligopolistic and imperfectly competitive markets; the economics of public utilities. Public policy toward industrial structure and conduct, including antitrust policy, limitation of competition, and direct regulation. FALL, SPRING. [3–3] Daughety, Reinganum.

329a–329b. Labor Economics. Static and dynamic models of labor demand and labor supply and models of human capital development. Applications of the theory to selected topics including: migration, fertility, health, wage determination, education, unionism and industrial relations, employment policies, implicit contracting and layoffs, and discrimination. Examination of methodological problems related to the analysis of labor markets. [3–3] (Not currently offered)

332a. Theory of Money and Finance I. Advanced topics in monetary and financial economics spanning theory and applications. Topics include recently developed dynamic theories of money and asset pricing; inflationary dynamics; money, welfare, and growth; money and business cycles; financial development and growth; credit market imperfections and financial crises. [3] (Offered 2007/2008)

332b. Theory of Money and Finance II. Analyzes microeconomic foundations and general equilibrium models of money and financial markets. Explores such topics as the theory of payments structure, capital asset pricing, rational expectations, efficient markets, contingent-claims markets, and others. Prerequisite: 259. [3] (Offered 2007/2008)

333. Topics in Microeconomics. Advanced theory and applications. May be repeated for credit if there is no duplication of topic. SPRING. [Variable credit: 1–3] Wen.

349a–349b. Reading Course. Designed to permit graduate students to do more intensive study in the area of their special interest than regular course offerings provide. Admission by consent of department chair and supervising professor. [Variable credit: 1–3 each semester]

353. Project Evaluation. Social-benefit cost analysis of investment projects: investment criteria, estimation of benefits and costs, and evaluation of shadow prices and of the social discount rate. The role of national planning. Case studies utilize the experience of developing economies. SPRING. [3] Ketkar.

354a. Public Finance Theory. The social welfare foundations of public finance theory, theories of optimal taxes and public goods treating equity, efficiency, and incentive effects in partial- and general-equilibrium frameworks. Prerequisite: 254 or consent of instructor. [3] (Not currently offered)

354b. Public Finance Seminar. Special topics in applications of public finance theory, including some or all of the following: theories of fiscal federalism, fiscal politics, fiscal policy, externality and pollution, public pricing, social insurance, public income distribution, public debt, cost-benefit analysis, international aspects of public finance, generalized theory of public policy, and issues in tax-expenditure reform. Prerequisite: 354a or consent of instructor. [3] (Not currently offered)

355a–355b. Seminar in Research on Economic Development. How to select and define an economic problem, assemble relevant factual and statistical information, and analyze and interpret it. Students will write a research paper. May not be included in the 24 hours required for the M.A. degree. Completion of both semesters with an average grade of *B* counts in lieu of M.A. thesis. Open only to students in the Economic Development program. 355a, FALL, SPRING; 355b, FALL, SPRING. [3–3] Anderson, Andrade; Huang, Andrade.

357. International Trade and Economic Development. Selected topics concerning the exchange and transfer of goods and resources between less- and more-developed countries. Possible topics include: the international monetary system, the SDR-aid link, dependence and imperialism, the role of trade in economic growth, foreign exchange strategies, and the structure of protection. Primarily designed for students in the Economic Development program. [3] (Not currently offered)

358a–358b. Policy Issues in Developing Economies. Economic analysis of problems in developing countries. 358a: Macroeconomic issues. Topics include monetary policy, financial repression and capital markets, fiscal policy, structural adjustment, inflation, and management of foreign debt. 358b: Microeconomic issues. Topics include public intervention in factor and commodity markets, migration, labor markets and employment, pricing and efficiency in the public sector, urban development and housing, and choices of technology. 358a, FALL. [3–3] Ketkar.

360. Agriculture and Economic Development. Food supply as a national problem; size and characteristics of population; agricultural technology; industrial-urban development and public policies as means of reducing market imperfections and raising output and incomes in rural areas. Case studies of the southern United States and selected underdeveloped countries. [3] (Not currently offered)

364. Economic Fluctuations and Stabilization Policy. The forces governing inflation, total output, and components of GNP, particularly investment decisions: macroeconomic models; short-term business forecasting; monetary, fiscal, and related stabilization policies. [3] (Not currently offered)

366a. Topics in Economic History: Microeconomic. This course will examine various microeconomic aspects of long-term development. Topics may include: the demographic transition, changes in labor force behavior, development of institutions, industrialization, migration, health, measurement of living standards and inequality. Students are expected to become familiar with various large-scale microeconomic databases containing historical information, such as the Integrated Public Use Micro-data Samples of the United States Census. [3] (Not currently offered)

366b: Topics in Economic History: Macroeconomic. This course will examine various macroeconomic aspects of long-term development. Topics may include: economic growth, the development of financial markets and the role of financial markets in economic development, the history and evolution of monetary and fiscal policy, capital market integration, and business cycles, including the Great Depression. Students are expected to become familiar with various macro-history databases (for example, the NBER database). [3] (Not currently offered)

369. Master's Thesis Research. [0–12]

370. Econometric Theory. Identification and estimation of simultaneous equation models. Small sample properties of estimators and Bayesian inference. Model building and testing of economic theory. Prerequisite: 309 or equivalent preparation. FALL. [3] Shintani.

371. An Introduction to Economic History. Economic history in terms of measurement and theory. Factors associated with modern economic growth and institutional change in a variety of countries and time periods. Relation between economic history and history of thought. SPRING. [3] Rousseau.

373. Time Series Econometrics. Estimation of stationary ARMA models, analysis of non-stationary time series models (unit roots and cointegration), introduction to structural time series models and spectral analysis. Models of time-varying conditional variances and models of regime-switching with applications to topics in macroeconomics and finance. Prerequisite: 309. SPRING. [3] Shintani.

374. Nonparametric and Semi-parametric Econometrics. Nonparametric and semi-parametric methods for the estimation and inference in econometric models. Methods include kernel, neural network, orthogonal series, and wavelets. Models include nonparametric models, the partially linear model, index models, and additive models. Prerequisite: 370 or equivalent. SPRING. [3] Fan.

375. Topics in Econometrics. Advanced theory and applications. May be repeated for credit once if there is no duplication. [Variable credit: 1–3] (Not currently offered)

377. Topics in Macroeconomics. Advanced theory and applications. May be repeated for credit once if there is no duplication of topic. FALL. [Variable credit: 1–3] K. Huang.

379. Seminar in Urban Economics. Readings of current research in urban economics. Individual student research projects on topics in locational economics and urban public finance.

Prerequisite: 279. Graduate students may audit 229, Urban Economics, simultaneously . [3] (Not currently offered)

383. Advanced Economics of Natural Resources and the Environment. Detailed analysis of the theoretical and empirical aspects of resource and environmental economics; modeling and empirical analysis of environmental externalities; theory of public investment as applied to natural environments; modeling and empirical analysis of renewable and nonrenewable natural resources. [3] Russell. (Not currently offered)

388a–b. Development and Growth. Contemporary theories and empirical studies of growth and development. Patterns and sources of growth, research and technology transfer, human capital and labor market performance, organization and institutions, inequality and redistributive policy, and welfare costs of inflation. Prerequisite: Econ 304a–b, 305a–b. [3] (Not currently offered)

390. Ph.D. Dissertation Proposal Development. Prerequisite: permission of director of graduate studies. FALL, SPRING. [0–3]

398. Workshop on Economics. Research seminar to aid advanced students in the selection of thesis topics and presentation of research papers. Topics covered depend on interests of students and faculty. FALL, SPRING. [0–3] Li, Rousseau.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Electrical Engineering

CHAIR Daniel M. Fleetwood
DIRECTOR OF GRADUATE STUDIES Benoit M. Dawant
PROFESSORS EMERITI Arthur J. Brodersen, James A. Cadzow, L. Ensign Johnson, Francis M. Wells, Edward J. White
PROFESSORS A. B. Bonds, George E. Cook, Jimmy L. Davidson, Benoit M. Dawant, Daniel M. Fleetwood, Kenneth F. Galloway, Dennis G. Hall, Weng Poo Kang, Kazuhiko Kawamura, Lloyd W. Massengill, Ronald D. Schrimpf, Richard G. Shiavi, Janos Sztipanovits, Robert A. Weller
ASSOCIATE PROFESSORS Bharat L. Bhuva, Gábor Karsai, Richard Alan Peters II, D. Mitchell Wilkes
RESEARCH ASSOCIATE PROFESSOR Michael L. Alles
ASSISTANT PROFESSORS T. John Koo, William H. Robinson

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

PROGRAMS in electrical engineering are offered in the areas of analog and digital circuits, computer engineering, intelligent systems, solid state devices, signal processing and analysis, robotics, microelectronics, and related areas in biomedical engineering.

The master of science degree program requires 24 credit hours, including 18 hours in the major area (within EECE) and 6 hours in a minor area. At

least 12 hours in the major area must be taken at or above the 300 level. The courses taken must also include one of the gateway courses in each of two of the following areas: electronics, computer, and signals and systems. Gateway courses are graduate-level courses with senior-level prerequisite, the list of which is maintained by the DGS. The remainder of the course work in the major must be taken at or above the 250 level. The minor will be six hours of graduate-level course work, typically outside of EECE. A maximum of 3 hours of independent study may be applied to the 18 hours required in the major area. The student's adviser must approve all courses. A research thesis is required. A non-thesis option is also offered, which requires an additional 6 hours of independent study constituting one single unit of research work.

A total of 72 hours is required for the Ph.D. degree. At least 36 of these hours must be course work, with at least 24 of the 36 hours in EECE. In addition to the 36 hours, an additional 12 hours must be either course work or independent study in EECE, as specified by the candidate's committee. Up to 24 credit hours taken as part of the master's degree program may be applied to the 72-hour total with the approval of the committee. At least 12 hours of coordinated study must be in a minor subject, typically outside the EECE program. The 6 minor hours taken as part of the master's degree may be applied toward the 12-hour requirement, and the 6 additional minor hours must be taken at or above the 250 level. Up to 12 total hours of course work numbered at or below 299 may be applied toward the 72-hour total, including hours taken at this level as part of the master's degree program and hours taken to fulfill the minor requirement (note that no course work in the major area may be numbered below 250). CS courses in the student's area of research can also be taken for EECE graduate program credit with written approval of the student's adviser. The remaining 24 hours may be in dissertation research hours, special readings, or transfer credit (if applicable). The candidate must complete at least 24 hours of formal course work while in residence at Vanderbilt. The candidate's adviser must approve all courses.

Specific and current degree requirements (including course selection, committee selection, preliminary examination, thesis/dissertation, and dissertation defense policies) are detailed in the Graduate Policy Document. A copy of this document should be obtained from the program office.

The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering.

218. Microcontrollers. 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 input/output with 8-bit microcontrollers, control algorithms, and networking with microcontrollers. Three lectures and one laboratory. No graduate credit for electrical engineering students. Prerequisite: EECE 116, CS 101. SPRING. [4] Karsai.

233. Electromagnetics. Introduction to electromagnetic field theory. Maxwell's equations are developed from the historical approach. Electromagnetic waves are discussed with regard to various media and boundary conditions. No graduate credit for electrical engineering students. Prerequisite: Physics 117b, Math 229. FALL. [3] Fleetwood.

235. Electronic Circuits I. Introduction to semiconductor devices and electr onic 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 cir cuits. No graduate credit for electrical engineering students. Thr ee lectures and one laborator y period. Pr erequisite: 213, 216. FALL. [4] Kang.

252. Signal Processing and Communications. AM and FM modulation. Also, advanced topics in signal processing are treated. Prerequisite: 214. [3] Wilkes.

253. Image Processing. (Also listed as Computer Science 253) The theor y of signals and systems is extended to two dimensions. Coverage includes filtering, 2-DFFTs, edge detection, and image enhancement. Three lectures and one laboratory period. FALL. [4]

254. Computer Vision. Vision is presented as a computational problem. Coverage includes theories of vision, inverse optics, image representation, and solutions to ill-posed problems. Prerequisite: 253. [3] Peters.

256. Digital Signal Pr ocessing. Applications of Digital Signal Pr ocessing (DSP) chips to sampling, digital filtering, FFTs, etc. Three lectures and one laborator y period. Prerequisite: 214. [4] Wilkes.

257. Control Systems I. Introduction to the theory and design of feedback control systems, steady-state and transient analysis, stability considerations. Cr edit given for only one of ECE 257 and ME 257. Prerequisite: 213. FALL. [3] Koo.

258. Control Systems II. Fundamental concepts of system theor y. Model representation. Linear vector spaces and their use in system analysis. Intr oduction to nonlinear systems and optimum control theory. Prerequisite: 257. SPRING. [3] Kawamura.

263. Signal Measurement and Analysis. (Also listed as Biomedical Engineering 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. Prerequisite: 214. FALL. [3] Shiavi.

264. Electromechanical Energy Conversion I. Theory and design of inductors, transformers, linear actuators, and simple motors. Pr erequisite: 213, Math 299. Cor equisite: 233. FALL. [4] Wells. (Offered in even numbered years)

265. Electromechanical Energy Conversion II. Theory and design of r otating machines. Dynamics and control of rotating machines. Prerequisite: 264, 257. SPRING. [4] W ells. (Offered in odd numbered years)

266. Power Electronics. Introduction to solid-state power electronics. Rectifiers, semiconductor switches, AC voltage controllers, controlled rectifiers, choppers, and inverters are studied. Three lectures and one laboratory. Prerequisite: 213, 235; Math 229. SPRING. [4] Wells.

267. Power System Analysis I. Analysis of large transmission and distribution networks. Analysis of power lines, load flow , short circuit studies, economic operation, and stability are introduced. Prerequisite: 213. FALL. [3] Wells. (Offered in odd numbered years)

268. Power System Analysis II. Continued study of load flow , short circuit analysis, economic operation, and stability of power systems. Intr oduction to protection fundamentals. Prerequisite: 267. SPRING. [3] Wells. (Offered in even numbered years)

269. Electrical Energy Pr oduction. The production of electrical ener gy by conversion methods, little used today, which will become important as traditional sources of energy are

depleted. Emphasis is on conservation, storage, efficiency, and direct energy conversion. Prerequisite: 213, Math 229. No credit for both 269 and ME 265. [3] (Not currently offered)

271. Introduction to Robotics. (Also listed as Mechanical Engineering 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. Math 230 (or equivalent) and ME 141 (or equivalent) recommended. FALL. [3] Cook.

272. Advanced Software Architectures. Tools and techniques for designing complex software systems. Programming language idioms, design patterns, and high-level architecture of systems. Overview of reactive systems, client-server architectures, distributed object systems, object database systems, and design methods for the above. Lectures and seminars. An intensive team-oriented project experience is included. Prerequisite: CS 201, knowledge of C++ language. SPRING. [3] Karsai, Ledeczi.

273. Parallel Systems. Design of hardware and software components of configurable parallel systems with emphasis on real-time, embedded applications. Survey of current design trends and approaches, hardware and software tools for parallel systems, and analysis of state-of-the-art parallel processors. Hands-on project experience using configurable parallel configurations. Prerequisite: 279. FALL. [3] Staff.

276. Embedded Systems. Advanced course on the design and application of embedded microcontroller-based systems. Architectures and capabilities of advanced microcontrollers. Embedded system modeling, design and implementation using real-time and event-driven techniques. A structured project is required. Intended for seniors. Prerequisite: 218. Corequisite: 276L. FALL [3]. Karsai.

276L. Embedded Systems Laboratory. Laboratory for EECE 276. A team-oriented structured project is required. One three-hour laboratory per week. Corequisite: 276. FALL [1].

277. FPGA Design. Design and applications of field-programmable gate arrays, CAD tools for design, placement, and routing. Practical experience is gained by implementing various designs on prototype FPGA board. A project is required. Prerequisite: 116 or consent of instructor. SPRING. [3] Bhuva.

280. Electronics II. 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: 235. SPRING. [3] Massengill.

283. Principles and Models of Semiconductor Devices. 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: 235 or consent of instructor. SPRING. [3] Kang.

284. Integrated Circuit Technology and Fabrication. Introduction to monolithic integrated circuit technology. Understanding of basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Elements of fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. Prerequisite: 235 or consent of instructor. SPRING. [3] Davidson.

285. VLSI Design. 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 pr oject. Prerequisite: 216, 235, or consent of instructor. FALL. [3] Bhuva.

287. Engineering Reliability. Topics in engineering r eliability with emphasis on electrical systems. Reliability concepts and models. Risk analysis. System examples. Pr erequisite: senior standing. FALL. [3] Johnson.

291–292. Special Topics. [Variable credit: 1–3 each semester] (Offered on demand)

301. Introduction to Solid State Materials. The properties of charged particles under the influence of an electric field, quantum mechanics, par ticle statistics, fundamental par ticle transport, and band theory of solids will be studied. FALL. [3] Weller.

302. Electric and Magnetic Pr operties of Solids. A review of electr omagnetic 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: 301 or equivalent. SPRING. [3] Weller.

304. Radiation Effects and Reliability of Micr oelectronics. An overview of 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 ef fects. Effects of defects and impurities on MOS long-ter m reliability. SPRING. [3] Fleetwood.

305. Topics in Applied Magnetics. Selected topics in magnetism, magnetic pr operties of crystalline and noncrystalline materials; ferrite materials for electronics and microwave applications, resonance phenomena. Prerequisite: 302 or consent of instructor . [3] (Offered on demand)

306. Solid-State Effects and Devices I. The semiconductor equations ar e examined and utilized to explain basic principles of operation of various state-of-the-ar t semiconductor devices including bipolar and MOSFET devices. SPRING. [3] Schrimpf.

307. Solid State Ef fects and Devices II. The structure of solids, phonons, band theor y, scattering phenomena, and theory of insulators. [3] Schrimpf.

311. Systems Theory. Analysis and design of multivariable contr ol systems using state space methods. Stability, controllability, and obser vability treated. Controllers designed using pole placement, optimal linear regulator, and the method of decoupling. State reconstruction via observers. SPRING. [3] Peters. (Offered in even numbered years)

331. Robot Manipulators. (Also listed as Mechanical Engineering 331) Dynamics and control of robot manipulators. Includes material on Jacobian matrix r elating velocities and static forces, linear and angular acceleration r elationships, manipulator dynamics, manipulator mechanism design, linear and nonlinear control, and force control of manipulators. Prerequisite: 271 (or equivalent). SPRING. [3] Cook.

341. Advanced Analog Electronics. Analysis and design of analog electronic circuits with emphasis on integrated cir cuits. Operational amplifiers, wideband amplifiers, multipliers, and phaselocked loops. FALL. [3] Massengill.

342. Advanced Digital Electr onics. Analysis and design of digital electr onic circuits with emphasis on integrated cir cuits. Logic families, semiconductor memories, and the analog-digital interface. SPRING. [3] Staff.

343. Digital Systems Ar chitecture. Architectural descriptions of various CPU designs, storage systems, IO systems, parallel and V onNeumann processors and inter connection networks will be studied. [3] (Offered on demand)

350. Artificial Neural Networks. (Also listed as Biomedical Engineering 350 and Computer Science 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] Noelle.

351. The Visual System. (Also listed as Cell and Developmental Biology 347, Neuroscience 347, Psychology 336) An interdisciplinary approach to how humans see and interpret their visual environment. Topics include the structure of the eye and brain (including optics), the physiology of individual cells and groups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week in addition to lecture, and turn in a more extensive paper than undergraduates. SPRING. [3] Casagrande (Cell and Developmental Biology), Bonds.

354. Advanced Real Time Systems. Covers hybrid architectures for combining symbolic and nonsymbolic programming for real-time systems; parallel architectures and programming methods for symbolic programming of dataflow systems, connection machines, actor systems; literature reviews and projects. SPRING. [3] Karsai.

355. Intelligent Learning Environments. (Also listed as Computer Science 364) Theories and concepts from computer science, artificial intelligence, cognitive science, and education that are important to 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 260, CS 360, or equivalent. SPRING. [3] Biswas.

356. Intelligent Systems and Robotics. Concepts of intelligent systems, AI robotics, and machine intelligence using research books and papers. Emphasis on how AI, brain research, soft computing, and 3D simulations are advancing robotics. Class projects. SPRING. [3] Kawamura.

357. Advanced Image Processing. (Also listed as Computer Science 357) Basic techniques of image processing. Topics include image formation, digitization, linear shift-invariant processing, feature detection, and motion. Prerequisite: Math 222; some C programming. FALL. [3] Dawant.

358. Computer Vision. (Also listed as Computer Science 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: 357 or Computer Science 357. SPRING. [3] (Offered in odd numbered years)

361. Random Processes. An introduction to the concepts of random variables, functions of random variables and random processes. Study of the spectral properties of random processes and of the response of linear systems to random inputs. Introduction to linear mean square estimation. The emphasis is on engineering applications. FALL. [3] Wilkes.

362. Detection and Estimation Theory. Fundamental aspects of signal detection and estimation. Formulation of maximum likelihood, maximum a posteriori, and other criteria. Multidimensional probability theory, signal and noise problems, and Kalman filter structure are studied. SPRING. [3] Cadzow.

365. Biomedical Pattern Recognition. (Also listed as Biomedical Engineering 365) General problems of pattern recognition with applications to biomedical signals and images. Topics

such as feature extraction, cluster analysis, discriminant analysis, statistical decision functions, and machine learning will be introduced. Prerequisite: 263 or equivalent. FALL. [3] Shiavi.

369. Master's Thesis Research.

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

391–392. Seminar. [1–1]

393–394. Advanced Seminar for Ph.D. Candidates. [1–1]

395–396. Special Topics. Based on research and current developments in electrical engineering of special interest to staff and students. [3–3]

397–398. Independent Study. 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]

399. Ph.D. Dissertation Research.

English

ACTING CHAIR Leah S. Marcus
DIRECTOR OF GRADUATE STUDIES Lynn E. Enterline
DIRECTOR OF CREATIVE WRITING PROGRAM Mark Jarman
PROFESSORS EMERITI Paul Elledge, R. Chris Hassel Jr., Walter L. Sullivan, Harold Lerow Weatherby Jr.
PROFESSORS Houston Baker, Vereen M. Bell, Jay Clayton, Colin (Joan) Dayan, Carolyn Dever, Lynn E. Enterline, Sam B. Girgus, Roy K. Gottfried, John Halperin, Mark Jarman, Michael Kreyling, Vera Kutzinski, Jonathan Lamb, Leah S. Marcus, Dana Nelson, John F. Plummer III, Hortense Spillers, Cecelia Tichi
ASSOCIATE PROFESSORS Tina Chen, Kate Daniels, Tony Earley, Teresa A. Goddu, Dennis D. Kezar Jr., Ifeoma Nwankwo, Bridget Orr, Mark Schoenfield, Kathryn Schwarz, Mark A. Wollaeger
ASSISTANT PROFESSORS Sean X. Goudie, Jaya Kasibhatla, Lorraine Lopez, Nancy Reisman, Shawn Salvant, Paul Young
WRITER IN RESIDENCE Alice Randall
VISITING WRITER IN RESIDENCE Peter Guralnick

DEGREES OFFERED: *Master of Arts, Master of Arts in Teaching, Master of Fine Arts, Doctor of Philosophy*

❧ THE graduate program in English offers course work and research supervision in all areas of British and American literature, Anglophone literature from other countries, film, cultural studies, and literary theory. The goal of the Ph.D. program is to produce scholars, critics, and teachers of literature and culture for colleges and universities.

Applicants must submit scores on the General Test of the Graduate Record Examination.

Requirements for the master's degree include 24 hours of course work and a thesis at the end of the M.A. year.

Requirements for the M.F.A. include 42 to 48 hours of course work, a thesis of creative work (a novel, a book of short stories, a collection of poems, or a collection of personal essays), plus an oral defense of the thesis.

Requirements for the Ph.D. include at least 52 hours of course work; Ph.D.–level proficiency in a foreign language; comprehensive examinations; and a dissertation.

Other regulations governing graduate work are available from the director of graduate studies. For more information on the M.F.A., see the Academic Programs chapter of this catalog.

Graduate seminars in English (301 through 325, 330, 350, and 355) may be taken four times for a maximum of 16 credit hours so long as topics are not duplicated.

301. Seminar in Middle English Literature. [4] (Not currently offered)

302. Seminar in Chaucer. SPRING. [4] Plummer.

303. Graduate Fiction Workshop. [May be repeated for credit if there is no duplication of topic] FALL, SPRING. [4] Lopez, Reisman.

304. Graduate Poetry Workshop. [May be repeated for credit if there is no duplication of topic] FALL, SPRING. [4] Daniels, Jarman.

305. Graduate Nonfiction Workshop. [May be repeated for credit if there is no duplication of topic] SPRING. [4] Earley, Guralnick.

306. Seminar in Sixteenth-Century Literature. [4] (Not currently offered)

307. Literature and the Craft of Writing. [May be repeated for credit if there is no duplication of topic] [4] (Not currently offered)

310. Seminar in Shakespeare. [4] (Not currently offered)

312. Seminar in Seventeenth-Century Literature. FALL. [4] Marcus.

314. Seminar, 1660–1800. SPRING. [4] Orr.

316. Seminar in Romantic Prose and Poetry. SPRING. [4] Schoenfield.

318. Seminar in Victorian Prose and Poetry. SPRING. [4] Bigelow.

320. Studies in American Literature. FALL, SPRING. [4] Goddu, Kutzinski, Luis, Nelson.

321. Studies in Southern Literature. [4] (Not currently offered)

325. Seminar in Modern British and American Literature. FALL. [4] Gottfried.

326. Introduction to Literary Modernism. (Also listed as Comparative Literature 326) [4] (Not currently offered)

330. Seminar in the Enlightenment and Its Literary Connections. [4] (Not currently offered)

337a. Introduction to Literary Theory. FALL. [4] Enterline.

337b. Introduction to Literary Theory. FALL. [4] Lamb.

350. Special Problems in English and American Literature. May be repeated. [Variable credit: 1–4]

355. Special Topics in English and American Literature. FALL, SPRING. [4] Dayan, Wollaeger, Young.

369. Master's Thesis Research.

370. Master of Fine Arts Thesis Research. SPRING. [8] Staff.

371. Teaching Composition and Literature. A five-year professional development program intended to prepare students to teach English at the college level. Required of and limited to graduate students on appointment in the English department. [3] (Not currently offered)

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Environmental Engineering

CHAIR David S. Kosson
DIRECTOR OF GRADUATE STUDIES James H. Clarke
PROFESSORS EMERITI W. Wesley Eckenfelder, John A. Roth, Richard E. Speece, Edward L. Thackston
PROFESSORS Mark D. Abkowitz, P. K. Basu, David J. Furbish, David M. Hercules, David S. Kosson, Sankaran Mahadevan, Frank L. Parker, Karl B. Schnelle Jr.
PROFESSORS OF THE PRACTICE James H. Clarke, Sanjiv Gokhale
ASSOCIATE PROFESSORS John C. Ayers, Alan R. Bowers, Eugene J. LeBoeuf
ASSISTANT PROFESSORS Caglar Oskay, Harold S. Park, Florence Sanchez, Kaye Savage, Luoyu R. Xu
RESEARCH ASSISTANT PROFESSORS Edsel B. Daniel, James P. Dobbins, Andrew C. Garrabrants, Leslie M. Shor

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

☙ THE master's degree in environmental engineering may be earned through (a) the regular program that includes 24 hours of class work plus a thesis or (b) a non-thesis program requiring 30 hours of class work. There are 18 hours of required course work plus an additional 3 hours required for the non-thesis program. Remaining course work consists of elective courses.

The Ph.D. program requires all of the courses required for the non-thesis master's degree plus an additional 3-hour math requirement and 6 hours of electives related to the dissertation topic as approved by the dissertation committee. A minimum of 39 hours of formal course work and a dissertation are required. In addition, all Ph.D. candidates must pass a comprehensive exam after completing the 18-hour core curriculum. No foreign language is required.

The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering.

Civil Engineering

252a–252b. Civil and Environmental Engineering Seminar. A two-part seminar series designed to introduce students to current technical and professional issues through literature discussions, seminars by faculty and practicing engineers, and participation in panel discussions. FALL, SPRING. [1–1]

259. Geographic Information Systems. Principles of computerized geographic information systems (GIS) and analytical use of spatial information. Integration with global positioning systems (GPS) and Internet delivery. GIS software utilization and individual projects. SPRING. [3]

286. Construction Project Management. Introduction to the theory and application of the fundamentals of construction project management. The construction process and the roles of professionals in the process. Broad 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. Prerequisite: CE 235 or consent of instructor. FALL. [3]

287. Construction Estimation. Fundamentals of construction estimating. Estimation of material, labor, and equipment quantities, including costing and pricing of projects. Application of estimating practices using real-world examples and project estimating software. Corequisite: CE 286. FALL. [3] Gokhale.

288. Construction Planning. 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 preconstruction through operation and maintenance. Use of real-world examples and project scheduling software. Prerequisite: CE 286 and CE 287. SPRING. [3] Gokhale.

290. Reliability and Risk Case Studies. Review of case studies involving successes and failures in managing reliability and risk assessment of engineering systems from a wide range of perspectives, including design, production, operations, organizational culture, human factors, and exogenous events. Analysis of event consequences in terms of public health and safety, the environment and business continuity, and the implications on regulation, legal liability, and business practices. Evaluation of 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 or consent of instructor. FALL. [3] Abkowitz.

307. Finite Element Analysis. 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. One-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. Finite element formulation of two-dimensional problems (single and multi-field)—mapping and shape functions, triangular and quad elements with straight or curved boundaries. Application problems in 1-D, 2-D, and 3-D. Three-D elements, singular problems, and elements of buckling and nonlinear problems. Error estimation and quality control. Computer implementation. Commercial packages. FALL. [3]

310. Probabilistic Methods in Engineering Design. (Also listed as MT 312) 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 r egression and correlation analyses, Monte Carlo simulation, reliability analysis and reliability-based design. FALL. [3]

311. Engineering Design Optimization. Methods for optimal design of engineering systems. Optimization under uncer tainty, reliability-based design optimization, r obust design, multidisciplinary problems, multi-objective optimization. Discr ete and continuous design variables, advanced numerical algorithms, and for mulations and strategies for computational efficiency. Practical applications and term projects in the student's area of interest. Prerequisite: Math 287, Math 288 or CS 257, CE 310. [3] (Offered on demand)

313. Advanced Reliability Methods. Computational methods for probabilistic analysis and design of modern engineering systems. Emphasis on system r eliability, nonlinear reliability methods, Weibull analysis, Bayesian methods, r esponse surface modeling and design of experiments, advanced simulation and variance r eduction concepts, sensitivity analysis and reliability-based design optimization. Practical applications using existing softwar e. SPRING. [3]

359. Emerging Information Systems Applications. (Also listed as MT 359) An intr oduction to emerging information systems technologies and their role in improving productivity and efficiency 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. FALL. [3]

371a–371b. Reliability and Risk Engineering Seminar . Seminars by expert speakers will 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 aer ospace systems; network systems (power distribution, water and sewage systems, transportation, etc.); manufacturing and construction; and electronic and software systems. FALL, SPRING. [1–1]

Environmental Engineering

260. Solid and Hazar dous Waste Management. Solid municipal and hazar dous waste management including generation, characterization, collection, tr eatment, and disposal. Legal requirements, risk assessment and management, costs and policy considerations; pollution prevention, recycling, and substitution. [3] (Offered on demand)

262. Hydrology. 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 203, CE 277. FALL. [3]

264. Environmental Assessments. Design and conduct of environmental assessments to evaluate risks posed by infrastructur e systems or envir onmental contamination. Impact analyses for sources, infrastructure modifications, due diligence environmental audits, and contaminated site remedial investigations. FALL. [3]

269. Radiological Aspects of Envir onmental Engineering. Characterization and detection of environmental radiation; biological effects of radiation; hazards, control, and disposal of radioactive wastes; use of radioactive tracers in environmental studies. SPRING of alternate years. [3]

270. Environmental Thermodynamics, Kinetics, and Mass Transfer. Examination of fundamental environmental processes and phenomena which provide the analytical tools necessary to solve a broad range of environmental problems. These tools include equilibrium phenomena, process rate and mass transport phenomena. FALL. [3]

271. Environmental Chemistry. 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. FALL. [3]

272. Biological Unit Processes. 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]

273. Environmental Characterization and Analysis. Introduction to the 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 is gained in combination with demonstrations featuring state-of-the-art analytical instrumentation. SPRING. [3]

274. Surface Water Quality Modeling. Physical, chemical, biological, and physiological processes in streams, lakes, estuaries, and surface water/groundwater interfaces. Analytical and numerical modeling techniques. One- and two-dimension computer simulation of surface water quality. Prerequisite: 270 or equivalent. SPRING. [3]

276. Ground Water Hydrology. 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. Students cannot receive credit for both ENVE 276 and Earth and Environmental Sciences 257. SPRING. [3]

277. Physical/Chemical Unit Processes. Principles of mass transfer, chemistry, and chemical reactor technology applied to the design and operation of water and wastewater treatment processes. Unit processes such as coagulation/flocculation, sedimentation, filtration, carbon adsorption, ion exchange, air stripping, precipitation, chemical oxidation, and chemical reduction will be evaluated as alternatives for the treatment of drinking water and industrial wastewaters. SPRING. [3]

280. Atmospheric Pollution. Fundamentals of atmospheric pollution and control. The sources and nature of gaseous and particulate air pollutants, the relation of meteorological conditions to their dispersal, and their effects on health and materials are discussed along with administration, standards, and control of air pollution. SPRING. [3]

296. Safety, Security, and Environmental Risk Management. Development of safety and security programs 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 or consent of instructor. SPRING. [3]

312. Pollutant Transport in the Environment. An introduction to the mathematical foundations of fluid mechanics and transport of pollutants in the environment. Fundamental conservation of mass, momentum, and energy equations will be developed. Appr opriate initial and boundary conditions and solution techniques will be discussed for a number of applications. [3]

325a–325b–325c. Individual Study. Literature review and analysis, or laboratory investigation, of special pr oblems under faculty super vision. FALL, SPRING, SUMMER. [V ariable credit: 1–4 each semester]

369. Master's Thesis Research.

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

399. Ph.D. Dissertation Research.

Environmental Management

THE Environmental Management Program offers guidance and support for the interdisciplinary study of environmental business, policy, law, engineering, and technology issues. The V anderbilt Center for Envir onmental Management Studies brings faculty members and students together fr om various disciplines for collaborative study and r esearch on topics such as environmental risk assessment; management and communication; organizational design and strategy; sustainability; policy analysis; envir onmentally conscious manufacturing and technology management; and global environmental issues.

Participating faculty include Mark D. Abkowitz (*Civil and Environmental Engineering*), James H. Clarke (*Civil and Envir onmental Engineering*), Mark A. Cohen (*Management*), David S. Kosson (*Civil and Envir onmental Engineering*), Frank L. Parker (*Civil and Envir onmental Engineering*), and Michael P. Vandenbergh (*Law*).

There are several options for students interested in pursuing the master's or Ph.D. degree in environmental management and r elated areas. For further details, contact Pr ofessor Cohen at *mark.cohen@owen.vanderbilt.edu* or Professor Clarke at *james.h.clarke@vanderbilt.edu* and visit the VCEMS W eb site at *www.vanderbilt.edu/VCEMS*.

French and Italian

CHAIR Virginia M. Scott
DIRECTOR OF GRADUATE STUDIES Robert Barsky
PROFESSORS EMERITI Barbara C. Bowen, Dan M. Church, Larry S. Crist, James Patty, Ruth G. Zibart
PROFESSORS Robert Barsky, Marc Froment-Meurice, Tracy Sharpley-Whiting, Patricia A. Ward
ASSOCIATE PROFESSORS William Franke, Anthère Nzabatsinda, Lynn Ramey, Virginia M. Scott, Holly A. Tucker
ASSISTANT PROFESSOR Nathalie Debrauwere-Miller
SENIOR LECTURERS Patricia Armstrong, Tracy Barrett, Susan Kevra, Martine Prieto, Mary Beth Raycraft, Nathalie Dieu-Porter

DEGREES OFFERED: FRENCH. *Master of Arts, Doctor of Philosophy*

❧ REQUIREMENTS for the master's degree include 36 hours of course work, all of which may be taken in the Department of French and Italian. French 300 and 310 are required as part of the 36 hours. Courses may be taken outside the department or a minor may be completed with the approval of the director of graduate studies. There is no thesis. A comprehensive examination, based on a departmental reading list, must be taken no later than the second week of the student's fourth semester of study.

Requirements for the Ph.D. include at least 51 hours of course work, including 14 courses in French at the 300-level, of which six must be literature seminars distributed among six different time periods. Students are expected to begin to register for research credit no later than their fifth semester of study. Up to 21 hours may be taken as research credit. Of the required 51 hours of course work, 9 hours will be taken in a minor field. An integrated minor of twelve hours outside the department is required for students writing dissertations in the field of second language acquisition. Students are required to take French 300 and 310 during their first year of study. During the second or third year of study, they must take one course in each of the following categories:

Language/Linguistics: French 302 (required for any student specializing in medieval or Renaissance literature), French 318 (required for any student specializing in second language acquisition), or French 320.

Literary Theory and Criticism: French 380 or an equivalent course outside the department, by permission of the director of graduate studies.

In addition to French and English, doctoral candidates must demonstrate a reading knowledge of a foreign language appropriate to the area of specialization. However, it is strongly recommended that students have a reading knowledge of both Latin and German. Other regulations governing graduate work are available from the director of graduate studies.

The Jean and Alexander Heard Library's rich collection of French materials makes research possible in all periods of French literature. The library's

special collections department also houses the W. T. Bandy Center for Baudelaire and Modern French Studies, the Pascal Pia collection (nineteenth- and twentieth-century literary criticism), the Gilbert Sigaux collection (twentieth-century French theatre), and the Wachs collection (eighteenth-century fiction and almanacs).

French

101G. French for Reading. Survey of grammar and vocabulary, with extensive reading. Available to graduate students for "no credit" only. SPRING. [0] Kevra.

203. Phonetics. Methodical comparison of French and English sounds. Correct formation of French sounds; oral exercises and aural training. FALL, SPRING. [3] Prieto.

207–208. French Civilization. Cultural achievements of France within a historical and geographic context. 207: from the origins to the revolution. 208: nineteenth and twentieth centuries, Napoleon to DeGaulle. 207: FALL; 208: SPRING. [3–3] Ward, Raycraft.

214. Advanced Conversational French. Emphasis on idiomatic usage and strategies for oral communication. Prerequisite: 201. FALL, SPRING. [3] Porter.

222. Introduction to Francophone Literature. 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, Indian Ocean, and Vietnam. FALL. [3] Nzabatsinda.

226. Advanced French Grammar. A systematic review with particular attention to morphology and syntax. Prerequisite: 201 or its equivalent. FALL. [3] Prieto.

232. The *Querelles des femmes*. Debates around the status of medieval and Renaissance women, including the *Roman de la rose*. Alain Chartier, Christine de Pisan, the Des Roches, Montaigne, and Marie de Gourney. [3] (Not currently offered)

234. Medieval French Literature. Thematic exploration of chronicles, romance, poetry, and theater of medieval France and the history and culture that surrounded these literary productions. [3] (Offered 2007/2008)

237. The Early Modern Novel. Development of the novel as a genre in the seventeenth and eighteenth centuries; its changing social, intellectual, and political context. [3] (Not currently offered)

238. The Twentieth-Century Novel. The novel as a genre in the context of modernity and post modernity. Readings will focus on narrative techniques. [3] (Offered 2007/2008)

239. The African Novel. The postcolonial francophone novel of Maghreb and Sub-saharan illustrating issues such as tradition and modernity, the identity of Africa, the representation of women, and the ideology of language. Recommended: 222. [3] (Offered 2007/2008)

253. Literature of the Fantastic. The theme of the fantastic in nineteenth- and twentieth-century prose fiction. Critical analysis using psychological and psychoanalytic concepts. Offered in France. [3] (Offered 2007/2008)

255. French Feminist Thought: Literary and Critical. Feminist themes in twentieth-century French literature and criticism. Authors include Beauvoir, Duras, Sarraute, Irigaray, Cixous. FALL. [3] Debrauwere-Miller.

256. Contemporary French Political Thought. Themes and concepts of major twentieth-century philosophers and philosophic movements. SPRING. [3] Froment-Meurice.

260. Enlightenment and Revolution. Major writers of the eighteenth century, including Montesquieu, Voltaire, Rousseau, Diderot; literature of the Revolution. [3] (Offered 2007/2008)

261. Age of Louis XIV. Literature and society in the reign of Louis XIV. Authors include Mme de Lafayette, La Fontaine, Molière, Pascal, Racine, and Mme de Sévigné. [3] Armstrong. (Offered 2007/2008)

265. From Romanticism to Symbolism. Nineteenth-century literature through its major movements; Romanticism, Realism, Naturalism, and Symbolism. [3] (Offered 2007/2008)

267. Twentieth-Century French Literature. Critical readings of representative works organized thematically with emphasis on their contextual and intertextual relationships. [3] (Offered 2007/2008)

289. Independent Study. Content varies according to the needs of the individual student. Primarily designed to cover pertinent material not otherwise available in the regular curriculum. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed 12 over a four-semester period]

294. Special Topics in French Literature. The subject will vary and will be announced in the *Schedule of Courses.* FALL, SPRING. [3]

295. Special Topics in French Language and Civilization. The subject will vary and will be announced in the *Schedule of Courses.* FALL, SPRING. [3]

300. Introduction to Research. Materials and methods of scholarly research, with attention to their relation to theories of literature. [3] (Offered 2007/2008)

302. History of the French Language: Medieval Period. Syntax, morphology, phonology, emphasis on textual explication. Prerequisite: elementary knowledge of Latin. SPRING. [3] (Not currently offered)

310. Foreign Language Learning and Teaching. (Also listed as German 310, Portuguese 310, and Spanish 310) Principles and practices of teaching a second language, with concentration on recent interactive and communicative models of foreign language instruction. Goals of the course are 1) to introduce principles of Second Language Acquisition and learning, 2) to critically read relevant literature in the area(s), and 3) to develop FL instructor's awareness through reflective and critical thinking. Classroom observations, journal writing, development of materials, and a small action-research project are expected. Required of all entering teaching assistants. [3] Scott. (Offered 2007/2008)

318. Applied French Linguistics. Phonetics, morphology, syntax, and semantics, with application to teaching; theories of second language acquisition. Prerequisite: Linguistics 201 or its equivalent. FALL. [3] Scott.

320. Linguistics and the Study of French Literature. Linguistics and related disciplines such as stylistics and pragmatics and their application to the analysis of literary texts. [3] (Not currently offered)

332. Seminar in Medieval French Literature. [3] (Offered 2007/2008)

338. Seminar in Sixteenth-Century French Literature. SPRING. [3] Ramey.

342. Seminar in Seventeenth-Century French Literature. FALL. [3] Tucker.

353. Seminar in Eighteenth-Century French Literature. SPRING. [3] Ward.

362. Seminar in Nineteenth-Century French Literature. [3] (Offered 2007/2008)

369. Master's Thesis Research. [0]

372. Seminar in Twentieth-Century French Literature. SPRING. [3] Debrauwere-Miller.

380. French Literary Theory. (Also listed as Comparative Literature 380) Literary theory as it has been shaped by and shapes the French tradition. [3] (Not currently offered)

388. Seminar in Francophone Literature. Literature of the French-speaking world ("La Francophonie"). [3] (Offered 2007/2008)

394. Special Topics in French Studies. Problems, themes, or issues in literature, language, or culture approached in ways that transcend traditional chronological distinctions. FALL. [3] Froment-Meurice.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Gender Studies

See Women's and Gender Studies

Germanic and Slavic Languages

CHAIR Dieter H. Sevin
DIRECTOR OF GRADUATE STUDIES Meike G. Werner
PROFESSORS Barbara Hahn, John A. McCarthy, Dieter H. Sevin
ASSOCIATE PROFESSORS Konstantin V. Kustanovich, David A. Lowe, Meike G. Werner
MELLON ASSISTANT PROFESSOR Margaret Setje-Eilers
ASSISTANT PROFESSORS Sara Eigen, Angela Lin, Christoph Zeller

DEGREES OFFERED:

GERMAN. *Master of Arts, Master of Arts in Teaching, Doctor of Philosophy*

☙ GRADUATE studies in German at Vanderbilt lead to the M.A., the M.A.T., and the Ph.D. The program leading to the M.A. degree is designed primarily to deepen and broaden the student's knowledge of German literature from its beginnings to the present day, with special emphasis on major areas not usually covered in-depth in an undergraduate course of study. The program is also intended to lay the groundwork for possible continuing study toward the Ph.D.

Candidates for the master's degree must meet three separate requirements: complete 30 hours of formal course work, submit written evidence of research abilities, and pass an oral examination based on course work and the departmental core reading list. Nine of the 30 hours are to be at the 300 level in the department, and a minimum of 3 hours should be in a graduate

seminar (i.e., numbered 386–391). Up to 6 credit hours may be transferred from outside the university. The oral examination is normally taken at the end of the student's third semester. As a rule, independent study will not fulfill the requirement of formal course work. Evidence of research abilities will usually take the form of a research paper of twenty-five to thirty pages that is based on a term paper and is to be submitted no later than the end of the student's fourth semester at Vanderbilt. As an alternative, students may choose to complete 24 hours of formal course work and to write a master's thesis. The latter is a research paper of sixty to eighty pages in length that gives evidence of scholarly competence and independent, critical thought. The research-writing requirement for this latter option is satisfied after the formal course work and the oral examination have been completed.

The department expects candidates to meet all formal course requirements for the master's degree within three semesters. The student must maintain a minimum *B* average, provide evidence of scholarly research abilities, and pass the oral examination to receive her/his degree. The M.A. examination committee consists of three faculty members drawn from the department; usually—but not necessarily—the chair or the director of graduate studies serves as one of the examiners.

In order to be admitted to candidacy for the master of arts degree, a student is required to prove ability in writing and speaking German to the satisfaction of the department.

All candidates awarded a Teaching Assistantship will enroll in Foreign Language Teaching Theory and Practice during their first term of teaching. The student arranges her/his program in consultation with the director of graduate studies and in recognition of departmental objectives.

The M.A.T. option offers up to 12 semester hours in the areas of methods of teaching (courses, research projects, and teaching internships). Work in this area is in addition to the minimum degree requirements for the M.A. in German. Students opting for the full program can expect to add at least one semester's work to their course of study.

Doctor of Philosophy

Admission to the M.A. program does not imply acceptance for candidacy in the Ph.D. program. Performance well above the minimum Graduate School requirement of a *B* is expected for admission to the Ph.D. program. Candidates normally obtain the M.A. before going on for the Ph.D. The purpose of the doctoral degree at Vanderbilt is to develop the talented candidate's capacity to make independent contributions to the field of German literature and cultural studies. Transfer students should consult the Graduate School requirements for the doctorate.

The Ph.D. degree requires at least two academic years of graduate study beyond the master's degree. A total of 72 credits beyond the B.A. degree is mandated by the Graduate School, thus 42 credits beyond the M.A. at Vanderbilt are necessary. A minimum of 36 of these hours are done in formal course work; most should be at the 300 level with a minimum of 12

required seminar hours. Moreover, at this advanced level of study, the candidate will have considerable latitude in developing a focus (9 hours) in a related discipline or in crossdisciplinary studies relevant to Germanics, for example, in comparative literature, critical theory, philosophy, political science, or history. The department encourages students of German to incorporate an interdisciplinary dimension into their doctoral work that might include the philosophy of language, political and social history, women's writing and the production of culture, censorship practices, or the impact of philosophy on aesthetic concepts and forms. Students completing a dissertation have the option under certain conditions of enrolling in 3995, half-time research (maximum of six years).

The director of graduate studies in German assists in devising related areas of concentration so that the student, at this stage, can be narrowing her/his focus for a dissertation topic. Faculty members actively assist students to determine the most promising topics for innovative research by pointing out interesting knowledge gaps, theoretical issues, or interdisciplinary questions.

A reading knowledge of French is usually expected, but another language may be substituted with the approval of the examination committee if it is felt that this language is relevant to the candidate's area of concentration or dissertation research. The second language requirement must be fulfilled before the candidate may take the comprehensive examination.

The teaching program option offers up to 12 credit hours in the area of teaching methodology (courses, research projects, and teaching internships). Work in this area does not count toward minimum degree requirements; 4 hours is normally the minimum in this program. Students opting for the full program should expect to add at least one semester to their course of study.

German

213–214. German Conversation and Composition. Graduate credit for M.A.T. candidates only. Prerequisite: 103. FALL, SPRING. [3–3] Werner, Sevin.

216. Business German. 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, policies, and laws in German-speaking countries; advertising and marketing strategies, letters, vitae, phone calls, and personal interviews. SPRING. [3] Setje-Eilers.

220. Advanced Grammar. 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] Setje-Eilers. (Not currently offered)

221–222. German Culture and Literature. Introduction to major periods and genres of German cultural production from the middle ages to the present; overview of major social and political developments. Literary, philosophical, and other texts. Readings and discussions in German. FALL, SPRING. [3–3] Setje-Eilers, Werner.

223. From Language to Literature. 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: 213. FALL. [3] Eigen.

235. German Romanticism. The contributions of Schlegel, Tieck, Novalis, Eichendorff, and others to literature, philosophy, and theory. Intellectual, social, and political currents. [3] Lin. (Not currently offered)

237. Women and Modernity. 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] Werner. (Not currently offered)

238. Interconnections of Arts and Science: Goethe and the Natural World. (Also listed as Physics 238) Mutual influences between the arts and science, as exemplified in Goethe's *Faust* and *Elective Infinities*. Readings in English, with option of German readings for German Studies majors. Focal points: empirical investigation, philosophical interrogation, and scientific explanation. Prerequisite: completion of Basic Science requirement. [3] Haglund (Physics), McCarthy. (Not currently offered)

241. The Racial Imagination. The complex and contradictory history of the idea of "race" as a scientific category. Study of medical, scientific, philosophical, anthropological, and literary texts. No German required. [3] Eigen. (Not currently offered)

243. The Aesthetics of Violence: Terror, Crime, and Dread in German Literature. 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] Zeller. (Not currently offered)

244. German Fairy Tales: From Brothers Grimm to Walt Disney. The German fairy tale tradition and its role in American culture. No German required. FALL. [3] Eigen.

245. Love and Friendship. Concepts of life and friendship, Greek antiquity to Romanticism, modern and postmodern times. Philosophical and literary texts, letters, and essays. Taught in English. [3] Hahn. (Not currently offered)

246. German Masterpieces in English Translation. Emphasis on the classical period and the present. Authors such as Goethe, Grass, Hesse, Kafka, T. Mann, and Schiller. No knowledge of German required. [3] (Not currently offered)

248. German Lyric Poetry—Form and Function. Lyric forms as a reaction to personal trauma, collective desire, scientific and technological advances, and social change since the Thirty Years' War. Love, loss, liberation. Students compose poems in imitation of classic examples of the folk song, ballad, sonnet. [3] McCarthy. (Not currently offered)

262. German Literature of the Middle Ages. Examines sites of literary production (monasteries, courts, urban centers) and the evolution of literary language. [3] Werner. (Not currently offered)

263. The Age of Goethe—Weimar 1775 to 1805. 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] McCarthy. (Not currently offered)

264. Pleasures and Perils in Nineteenth-Century Theater. The German drama and dramatic theory from Romanticism up to Naturalism with emphasis on selected works by Kleist, Büchner, Grillparer, and Hebbel. [3] Setje-Eilers. (Not currently offered)

265. Revolutionizing Twentieth-Century Theater. German drama and dramatic theory from Naturalism to the present. Emphasis on Brecht and post-Brechtian drama. [3] Zeller. (Not currently offered)

266. Nineteenth-Century Prose. A study of representative works of the main literary trends from Romanticism to Naturalism. [3] Lin. (Not currently offered)

267. The German Novel from Kafka to Grass. A study and interpretation of the main literary trends and major figures in twentieth-century narrative. [3] Sevin. (Not currently offered)

268. Modern German Short Story. From 1945 until the present, including such authors as Ilse Aichinger, Heinrich Boell, Wolfgang Borchert, Ingeborg Bachmann, and Alexander Kluge. [3] (Not currently offered)

269. Writing under Censorship. An introduction to the main literary trends and authors of the former East Germany (1949–1989). Taught in German. FALL. [3] Sevin.

270. German Cinema: Vampires, Victims, and Vamps. 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. SPRING. [3] Sevin.

271. Women at the Margins: German-Jewish Women Writers. 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. SPRING. [3] Werner.

273. Nazi Cinema: The Manipulation of Mass Culture. 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 German required. [3] Eigen. (Not currently offered)

274. Who Am I? German Autobiographies. Canonical and non-canonical texts from the nineteenth and twentieth centuries constructing cultural, religious, and gender identities. SPRING. [3] Hahn.

275. Art and Rebellion: Literary Experiment in the 1960s and 1970s. German literature under the conditions of protest and rebellion. Experiments in poetry, prose, and theater; new directions in art and media theory; historical influences. FALL. [3] Zeller.

278. Dreams in Literature. 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. [3] Hahn. (Not currently offered)

280. Murder and Mayhem: The *Sturm und Drang*. *Sturm und Drang* literary and social movement (1767–1782). Literary genres and themes (e.g., infanticide, suicide, fratricide; primitivism, educational reform, utopian visions). Drawn from French (Diderot, Rousseau, Mercier) and English (Young, MacPherson, Shakespeare) impulses. The young Goethe and Schiller, Herder, Hamann, Lenz, L. Wagner. [3] McCarthy. (Not currently offered)

289a–289b. Independent Readings. Designed for majors and qualified undergraduates. 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. [Variable credit: 1–3 each semester, not to exceed a total of 6 over a four-semester period, in both courses combined]

294a–294b. Selected Topics. Topics of special interest in language, literature, and culture, e.g., The Image of America in German Literature, German Exile Literature, Germany in the Twenties, Kafka, Brecht, Scientific Readings, Literature and Art in the Middle Ages, *Faust*, Austrian and Swiss Literature. Topics to be announced in the *Schedule of Courses*. [3–3, not to exceed a total of 12]

310. Foreign Language Learning and Teaching. (Also listed as French 310, Portuguese 310, and Spanish 310) Principles and practices of teaching a second language, with concentration on recent interactive and communicative models of foreign language instruction. Goals of the course are 1) to introduce principles of Second Language Acquisition and learning, 2) to critically read relevant literature in the area(s), and 3) to develop FL instructor's awareness through reflective and critical thinking. Classroom observations, journal writing, development of materials, and a small action-research project are expected. Required of all entering teaching assistants. FALL. [3] Scott.

312. Foreign Language Curriculum Development and Evaluation. (Also listed as French 312, Portuguese 312, and Spanish 312) Focus on planning, development, implementation, and evaluation phases of language teaching from a systematic curriculum development perspective. Students are expected to become conversant with the research literature in the area and work on curricular projects according to their interests. An important part of the course will be dedicated to program evaluation, including training in recognized instruments and procedures to analyze and interpret data. They are expected to produce a research-based curricular project. [3] (Not currently offered)

314. Bibliography and Methods. An introduction to German studies in the U.S., to the resources and practice of literary history and criticism. FALL. [3] McCarthy.

316. Literary Theory and Criticism. Selected problems of literary theory, history, and interpretation. [3]

329a. Teaching Program Option: Internship in Advanced Language and Literature Courses. Graduate interns participate in the teaching of advanced language or literature courses and receive training in the writing of syllabi, text selection, testing, the development of supplementary materials, the selection of visual aids. FALL, SPRING. [Variable credit: 1–2 each semester, not to exceed a total of 6]

330. Expressionism. The chief intellectual movement in Germany and Austria from 1910 to 1925. Topics include all genres of literature with frequent references to other disciplines including politics, the pictorial arts, and film. In German. [3] McCarthy. (Not currently offered)

335. Enlightenment and Its Literary Connections. (Also listed as Comparative Literature 330 and English 330) Philosophy and literature in the age of reason; emphasis on aesthetic innovation and rise of the modern individual; authors include Locke, Kant, Richardson, and Lessing. [3] McCarthy. (Not currently offered)

340. Beyond Good and Evil. [3] McCarthy. (Not currently offered)

351. Philosophical Backgrounds of German Literature. Survey of German philosophical thinking from Leibnitz to Nietzsche and its importance for German literature from Goethe to Hesse. [3] McCarthy. (Not currently offered)

369. Master's Thesis Research. [0]

385a–385b. Problems in Germanic Languages and Literatures. SPRING. [3–3]

Graduate seminars in German explore individual authors, forms, theories, or works at an advanced level. Recent selections include Twentieth-Century Reception of Medieval Literature, Rise of the Author, Büchner, Kleist, Expressionism, Exile Literature, and Christa Wolf. Topics to be announced in the Schedule of Courses. *May be repeated for credit.*

387. Seminar: Studies in Medieval Literature. [3] (Not currently offered)

388. Seminar: Studies in Literature 1400–1680. [3] (Not currently offered)

389. Seminar: 18th-Century German Literature. FALL. [3] McCarthy.

390. Seminar: 19th-Century German Literature. [3] Eigen, Sevin. (Not currently offered)

391. Seminar: 20th-Century German Literature. The Aesthetics of Violence. FALL. [3] Zeller.

392. Seminar: Problems of Theory in German Studies. Author, Archive, Work. SPRING. [3] Hahn.

393. Seminar: Intellectual Constellations. [3] Hahn. (Not currently offered)

394. Seminar: Society and Ethics. [3] Hahn. (Not currently offered)

395. The Racial Imagination. The complex and contradictory history of the idea of "race" as a scientific category. Study of medical, scientific, philosophical, anthropological, and literary texts. No knowledge of German is required. FALL. [3] Eigen.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Russian

Courses in Russian may be used as minor credit in graduate programs.

171–172. Russian Culture. The evolution of Russian civilization. The interplay between East and West in the shaping of Russian cultural achievements and national identity. No knowledge of Russian required. 171: From Kievan Russia to 1880. 172: From 1880 to the present. [3–3]. (Not currently offered)

221–222. Survey of Russian Literature in English Translation. Main currents, writers, and works of Russian literature. 221: the nineteenth century: Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy. 222: the twentieth century: Bulgakov, Pasternak, Solzhenitsyn, Aksenov, Trifonov, and Petrushevskaya. No knowledge of Russian required. [3–3] Lowe, Kustanovich. (Not currently offered)

223–224. Composition and Conversation. Development of all language skills at the intermediate-advanced level. Reading of contemporary short stories. Prerequisite: 204. FALL, SPRING. [3–3] Lowe, Kustanovich.

231. Jews in Russian Culture: Survival and Identity. A course on the history of Jewish contributions to Russian culture, including literature, the visual arts, theater, and film. Questions of assimilation, the rise of Jewish national consciousness, and interest in Jewish heritage are discussed. No knowledge of Russian required. [3] (Not currently offered)

232. The Evil Empire: Stalin's Russia. Life in Stalin's Russia as portrayed in memoirs, novels, stories, poetry, films, and music. No knowledge of Russian required. SPRING. [3] Lowe.

233. *Crime and Punishment*. Dostoevsky's psychological thriller *Crime and Punishment* and two kinds of related texts: those that influenced Dostoevsky's classic crime novel (works by Pushkin and Balzac) and those influenced, in turn, by Dostoevsky's novel (works by Nabokov and Trifonov). No knowledge of Russian required. [3] (Not currently offered)

234. The Russian Cinema. Socialist Realism of the 1930s to 1950s; masterpieces of the post-Stalin era in the 1960s and '70s; sex and violence of the Perestroika; new post-Soviet cinema. Films by such directors as Eisenstein, Pyryev, Romm, Tarkovsky, Mikhalkov, and Sokurov are studied and discussed within the political context. No knowledge of Russian required. FALL. [3] Kustanovich.

257–258. Advanced Composition and Conversation. Prerequisite: 224 or equivalent. [3–3] (Not currently offered)

289a–289b. Independent Readings. Consists of a project to be carried out under the supervision of a member of the depar tment faculty. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed a total of 6 over a four-semester period, in both courses combined]

Hearing and Speech Sciences

CHAIR Fred H. Bess
DIRECTOR OF GRADUATE STUDIES Edward G. Conture
PROFESSORS EMERITI Russell J. Love, Judith Rassi, R. E. Stone Jr., Robert T. Wertz
PROFESSORS Fred H. Bess, Stephen M. Camarata, Edward G. Conture, D. Wesley Grantham, Linda J. Hood, Gary P. Jacobson, Howard S. Kirshner, Gus Mueller, Ralph N. Ohde, Robert H. Ossoff
RESEARCH ASSISTANT PROFESSORS Benjamin W. Y. Hornsby, Alexandra Key, Doug Sladen
CLINICAL PROFESSOR Gary A. Duncan
ASSOCIATE PROFESSORS Daniel H. Ashmead, Gene W. Bratt, Lee Ann Golper, Todd A. Ricketts, Teris K. Schery, Anne Marie Tharpe, Mark Wallace
ASSISTANT PROFESSORS Patricia F. Allen, Tamala Bradham, Candice Burger, Mary N. Camarata, William Dickinson, Mary Sue Fino-Szumski, David Gnewikow, Corrin G. Graham, Troy Hackett, Sue Hale, Devin McCaslin, Daniel Polley, C. Melanie Schuele, Wanda G. Webb
ASSISTANT CLINICAL PROFESSOR John R. Ashford

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

THE master's degree program provides for concentrated study in speech language pathology and is supplemented by pr ograms in early intervention educational audiology and teacher licensur e for speech-language pathology (for those desiring to work in public schools as speech-language pathologists). The master 's degree program is CAA accredited by the American Speech-Language-Hearing Association. Further information regarding graduate programs in hearing and speech sciences may be found online at *www.vbwc.com*.

The curriculum and practicum maintained for these pr ograms provide each student the opportunity to meet r equirements for certification by the American Speech-Language-Hearing Association and for licensure in virtually all states where licensure is required. To achieve this goal, the student must exceed the minimum requirements for the master's degree set by the Graduate School. Completion of the master 's program ordinarily requires four semesters and one summer session, in most cases including an externship during the fifth semester . Those students without an under graduate major in audiology/speech-language pathology will ordinarily take longer than 5 semesters to complete the master's degree. Master's degree students

complete a total of 50 to 60 hours of course work, depending on the background and/or courses needed for certification. Students who want to earn the master's degree through a thesis option instead of clinical work leading to certification must complete at least 42 to 44 semester hours of formal course work and a research-based thesis. The thesis option must receive faculty approval prior to initiation of this plan of study.

The Ph.D. degree normally requires three years of study with a minimum of 72 graduate credit hours. There are no foreign language requirements; however, the student must complete two research projects and 12 hours of course work in statistics and research methodology prior to the dissertation. Doctoral candidates also present a minor of not less than 12 hours taken outside the department or from another subject area in hearing, speech, and language. The final year of the program is typically devoted to the dissertation.

This department also offers the Doctorate of Audiology (Au.D.) through the Medical School (*www.vanderbilt.edu/catalogs/medical/09_MEDV01.pdf*, page 361).

The teaching, clinical, and research programs of the department are housed primarily in Vanderbilt's Bill Wilkerson Center.

206. Anatomy and Physiology of Speech and Hearing Mechanisms. The basic processes of speech production, acoustics, and perception. Neuroanatomy, anatomy, physiology, acoustics, and acoustic correlates of sound features. Intended for undergraduates and graduate students outside the Department of Hearing and Speech Sciences. SPRING. [3] Ohde.

217. Hearing Disorders and Assessment. An introduction to the major pathologies of the peripheral and central auditory system as well as the medical/surgical treatment of those pathologies, followed by an introduction to the equipment and procedures used to assess auditory function in patients of all ages. SPRING. [3] Hornsby.

300. Neurology of Speech and Language. The structure and function of the nervous system, with emphasis on the neural mechanisms of speech and language. Neurologic conditions producing speech and language disorders are surveyed. FALL. [3] Webb.

301. Acoustics and Perception of Speech and Speech Disorders. An examination of the processes of speech production, acoustics, and perception. Emphasis on relevant literature and research techniques in speech science. FALL. [3] Ohde.

302. Hearing Science. A discussion of basic acoustics as it applies to hearing science. Anatomy and physiology of the peripheral and central hearing mechanism and vestibular system. FALL. [3] Hackett.

304. Child Language Acquisition. The components and processes of normal language development. Relation to social and cognitive aspects of child development. Survey of developmental psycholinguistic research. FALL. [2] Schuele.

305. Clinical Principles and Procedures. Presentation and demonstration of clinical principles and procedures applicable in communication sciences and disorders. FALL. [3] Golper.

306. Child Language Disorders. The language development of children of variant populations. Focus on description of populations, assessment techniques, and intervention strategies. Clinical applications of research in normal language acquisition. FALL. [3] Schuele.

307. Seminar: Topics in Childhood Language Disor ders. Current issues in nor mal language acquisition and clinical applications to variant populations. Content of seminar rotated. FALL. [2] Staff.

309. Language and Literacy in Childr en with Hearing Loss. This course pr esents an overview of normal language acquisition and the challenges imposed by a hearing loss. A variety of methods and materials to develop oral and written language and r eading will be included. Practical methods of assessment, supportive strategy development, and curricular adaptations for children with hearing loss will be explored. SPRING. [3] TBA

310. Measurement of Hearing. The theory and practice of hearing measur ement, with emphasis on r outine clinical and scr eening audiometric techniques, testing envir onment, audiometric standards and calibration, applied impedance measur ements, and interpretation of audiometric tests. FALL. [3] Gnewikow.

311. Stuttering. Significant research in the field of stuttering, with emphasis on etiology and therapy. The management of fluency disturbances. SPRING. [3] Conture.

312. Psychology and Culture of the Deaf. Presentation and discussion of significant historical and current issues relating to the Deaf population. Primar y focus will be on psychological development, educational/methodological models, and Deaf cultur e. Although the principal focus is on the psycho/social and cognitive/intellectual development of deaf individuals through the lifespan, a general survey of other ar eas of exceptionality is made with emphasis on the implications for the deaf child with additional disabilities and/or special needs. SPRING. [2] TBA

313. Management of Communication Disorders in the Schools. This course provides an overview of management principles and practices for childr en with communication disorders during the school-age years. Curriculum-based communication assessment and methodologies for implementation of communication pr ograms in school settings will be addressed. SPRING. [3] Hausman.

314. Articulation Disor ders and Clinical Phonetics. The etiology, evaluation, and management of ar ticulatory defects in childr en and adults. Pr erequisite: consent of instructor. FALL. [3] Ohde.

315. Introduction to Autism Spectrum Disorders. This class will provide an overview of normal social, play, linguistic, and cognitive development compar ed to the featur es and behavioral characteristics of autism spectrum disor ders (ASD) and will intr oduce the student to causative factors and management approaches with ASD. SPRING. [3] Hale, Wallace.

316. Motor Speech Disorders. A study of the nature and treatment of the adult and childhood dysarthrias and dyspraxias of speech. Management of infants and young childr en at neurological risk for developing motor speech disability. Rights of the severely communicatively disabled. Prerequisite: 300 or consent of instructor. SUMMER. [2–3] Webb, Golper.

317. Aphasia/Traumatic Brain Injury. This course is taught in thr ee modules in the following sequence: I) Cognitive-Communicative Disorders Following Acquired Brain Injuries, II) Adult Aphasia, and III) Communication in Association with Right Hemispher e Damage and Dementia. These modules examine the pathophysiology of acquir ed brain injuries and str oke and neuroanatomical correlates of the cognitive and communicative impair ments associated with these conditions. Dif ferential diagnosis, evidence-based tr eatment, and outcomes assessments are stressed in a review of the management of individuals who have had traumatic brain injuries, aphasia, and r elated conditions, and their co-survivors. SPRING. [4] Golper, Webb, Allen, Jacobson.

318. Educational Audiology and Aural Habilitation for Children. A survey of approaches to aural rehabilitation for children. Specific focus will be on intervention for children with hearing loss in educational and other habilitative settings. SPRING. [3] Tharpe.

319. Dysphagia. The study of the normal and disordered swallow in pediatric and adult populations. Anatomy and physiology, videofluoroscopic and other assessment procedures, as well as various treatment alternatives and techniques are included. FALL. [3] Ashford.

320. Introduction to Amplification for Infants and Children. Designed for deaf education and speech-language pathology students. Current issues and trends in conventional amplification for infants and children. Selection, fitting, verification, and validation of traditional amplification options will be addressed including directional vs. omnidirectional microphones, analogue vs. digital instruments, monaural vs. bilateral fittings, and real-ear measures vs. functional-aided gain. Hearing aid retention, maintenance, and troubleshooting techniques are addressed. FALL. [2] TBA

321. Seminar: Intervention for Pediatric Acquired Brain Injury. Assessment and intervention techniques for cognitive/communicative and behavioral deficits associated with pediatric acquired brain injuries. Emphasis on effects on normal development, educational curricula modifications and teacher/family training. Prerequisite: 317 or permission of instructor. SUMMER. [2] Allen.

323. Early Assessment and Intervention Methods in Children with Autism Spectrum Disorders. The course addresses basic theories and principles associated with assessment and management of children with Autism Spectrum Disorders. Auditory characteristics, classroom structure, behavior management, communication strategies, social and peer interaction, and family-focused practices are also addressed. FALL. [2–3] Hale.

325. Pediatric Audiology. Methods and procedures used in the evaluation of the auditory function and management of neonates, infants, and young children. Includes identification and intervention procedures. FALL. [3] Tharpe.

327. Hearing Loss and Speech Understanding. This course examines various factors that may affect the speech understanding of persons with hearing loss. The contribution to the unaided and aided speech understanding of persons with hearing loss of 1) subject factors, such as degree of hearing loss, and deficits in frequency and temporal resolution, and 2) environmental factors, such as, the level and type of background noise, reverberation and talker characteristics, will be examined. Methods for predicting speech understanding will also be discussed. SPRING. [3] Hornsby.

328. Psychoacoustics. Psychoacoustic theory and methods. Auditory perception in normally hearing and hearing impaired subjects. SPRING. [3] Hornsby.

330. Advanced Audiologic Evaluation I. Diagnostic audiometry principles and procedures, including acoustic reflex measures, speech audiometry, auditory brainstem response (ABR), and electrocochleography (ECochG). Also, newborn auditory screening with ABR. Practicum required. SPRING. [3] Jacobson.

331. Teaching Children with Hearing Loss to Listen and Speak. Theories of and methods for developing auditory perception and spoken language skills in deaf and hard-of-hearing children. The purpose of this course is to increase students' skills in assessing and developing speech, auditory functioning, and phonologic awareness in deaf and hard-of-hearing children. SPRING. [3] TBA

332. Pathology of the Auditory System. Auditory pathologies resulting from genetic origin, disease, injury to the ear, and lesions of the nervous system. FALL. [3] Bratt.

334. Seminar in Neurogenic Communication Disorders. Research literature on the relationship between brain and speech-language performance, emphasizing current methodology for studying neurological speech and language disorders. Prerequisite: 300 or 331 or consent of instructor. FALL. [2] Staff.

335. Seminar in Augmentative Communication. The application of augmentative communication devices to patients with physical and/or cognitive disabilities. The various types of devices available, the techniques for selecting and applying these systems to individual patients, and specific information on how to achieve effective conversational use of such systems. FALL. [2] Webb.

336. Communication Disorders Associated with Craniofacial Anomalies and Voicing Disorders. Theories of resonance and voice production, normal development, etiology, assessment, and management of speech communication disorders associated with craniofacial anomalies and vocal production. SUMMER. [4] Kirby, Ashford.

338. Research Methods in Communicative Disorders. Research techniques and procedures. Analysis of research examples from the literature. Study of design of experiment, data collection, statistical analysis, and presentation of research findings. FALL. [1] Camarata.

340. Amplification I. Background and development of the design of hearing aids, earmold acoustics, electroacoustic characteristics, performance standards and measurement techniques, clinical selection and evaluation procedures. FALL. [3] Ricketts.

341. Seminar in Audiology. Significant literature in the field of audiology. Directed study in assigned subject areas. FALL, SUMMER. [2] Staff.

342. Advanced Audiologic Evaluation II. Central auditory assessment. Selected neurophysiology clinical procedures in audiology, including otoacoustic emissions, auditory middle-latency, late and P300 responses and brain mapping, somatosensory and visual evoked responses, electroneuronography, and OR/ICU neuromonitoring. Practicum required. FALL. [3] Jacobson.

343. Hearing Conservation. A discussion of noise levels, OSHA guidelines, noise-induced hearing loss, and hearing protection in work and leisure activities. Industrial audiology including testing, training, and intervention protocols. SUMMER. [3] Gnewikow.

344. Administrative Issues in Communicative Disorders. A discussion of some of the important issues affecting the administration of programs in communication disorders. Emphasis on business management, marketing, financial management, third-party payors, grants and contracts, state and federal agencies, and fundraising. SUMMER. [Variable credit: 2–3] Bess.

345. Amplification II. Advanced topics in amplification including: advanced probe microphone techniques, single and multi-channel compression systems, analog and digital signal processing, and current and emerging prescriptive and fitting verification methods. FALL. [3] Ricketts.

346. Assessment of Vestibular Disorders. An in-depth approach to the assessment of the dizzy patient. Subject matter will include: anatomy and physiology of the peripheral and central vestibular, ocular motor and postural control systems; introduction to both electrical and video techniques for recording the vestibulocular reflex; case history and bedside assessment of the dizzy patient, technique and interpretation of electronystagmography, rotational testing, computerized dynamic posturography and sonomotor responses; assessment of self-report dizziness handicap, falls risk assessment in the elderly and vestibular rehabilitation. Students will be expected to conduct practica outside the classroom. SUMMER. [3] Jacobson, McCaslin.

347. Management of Vestibular Disorders. This course will focus on interpretation and analysis of balance laboratory results in dizzy patients as well as treatment and therapy provided by other professionals. Subject matter will include: advanced concepts in central vestibular system physiology, peripheral and central disorders of the vestibular system and their clinical findings, introduction to imaging dizzy patients, disequilibrium of aging and risk of falls assessment, drug treatment of vertigo, surgical treatment of vertigo, and vestibular rehabilitation. FALL. [3] Jacobson, McCaslin.

348. Audiology in Education. (Also listed as Special Education 2600) Current issues and trends concerning the role of the audiologist in the public school setting. Emphasis on early identification and intervention, inservice education, amplification, and the roles of federal, state, and local agencies in providing services to the hearing-impaired school-age population. SPRING. [3] Fino-Szumski.

349. Laboratory: Audiology in Education. Demonstration and hands-on experience with personal and classroom amplification systems. Operation and troubleshooting of amplification systems commonly used in a classroom setting. Specifically, hearing aids, FM systems, assistive listening devices, vibrotactile devices, and cochlear implants will be demonstrated. Co- or prerequisite: SPED 2600 or HRSP 2600. FALL. [1] Fino-Szumski.

351. Special Problems in Speech Pathology. Areas and problems not included in other courses in speech pathology, chosen to fit the students' interests and the needs of their programs. May be repeated to a total of 12 hours. FALL, SPRING, SUMMER. [Variable credit: 1–6] Staff.

352. Special Problems in Audiology. Areas and problems not included in other courses in audiology, chosen to fit the students' interests and the needs of their programs. May be repeated to a total of 12 hours. FALL, SPRING, SUMMER. [Variable credit: 1–6] Staff.

353. Auditory Prostheses. Design and evaluation of auditory prostheses for listeners with hearing loss. Theoretical and clinical considerations of cochlear and auditory brainstem implants as well as hearing aids from a prostheses perspective. SPRING. [3] Ricketts.

354. Cochlear Implants for Infants and Children. Current issues in the medical, audiological, speech/language, and educational management of children with cochlear implants. Emphasis on multidisciplinary team function. Intended for undergraduates in Deaf Education and graduate students in Hearing and Speech Sciences. Prerequisite: 318. SPRING. [3] Tharpe.

355. Clinical Internship/Externship in Speech-Language Pathology. Sequence of clinical practicum placements over five semesters for speech-language pathology majors in clinical track. Designed to meet supervised-practicum requirements for eventual certification by American Speech-Language-Hearing Association. Sequence of initial part-time internship placements in campus and other local facilities, followed by a full-time externship placement at one of many selected sites throughout the country or abroad. SPRING, SUMMER. [6–7] Hale.

356. Internship/Externship: Maymester. A three-week intensive, full-time clinical or classroom placement during the month of May in an auditory-oral environment designed specifically to meet the student's individual interests and needs. May Session. [Variable credit: 0–3] TBA

357. Professional Issues in Communication Disorders. Examines various professional issues within the fields of speech-language pathology and audiology. For example, ethics, malpractice, quality improvement, marketing, reimbursement, multicultural sensitivity, and federal legislation. SPRING. [1] Hale.

359. Audiometric Instrumentation and Calibration. An introduction to fundamental concepts in electronics and computer science and to instrumentation used in the hearing clinic or research laboratory for producing, measuring, and analyzing audio signals. Standards and procedures for calibration measurements, with practical hands-on experience. FALL. [3] Grantham, Ricketts.

361. Principles of Counseling and Interviewing in Communication Disorders. Examines the helping relationship in the clinical process, counseling theory relative to audiology and speech-language pathology practices, and principles and methods of effective clinical interviewing and counseling. TBD. [2] Hale.

363. Hearing and Aging. A survey of major concepts in gerontology, including demographics, psychosocial aspects of aging, biology of aging, and clinical conditions of the older adult. Physiological changes within the aging auditory system, and clinical issues in audiological assessment and intervention with older hearing-impaired patients. SUMMER. [3] Rosenfeld.

369. Master's Thesis Research. [0]

371a–371b. Research Design and Statistical Analysis. Covers topics in research design and statistics for students preparing for research careers in hearing science, speech science, and communication disorders. Reviews mathematical bases for probability theory and statistical inference. Covers fundamental parametric and nonparametric statistical tests, with extensive discussion of research design in the context of analysis of variance. Presents statistical properties of psychophysical methods and signal detection theory. FALL, SPRING. [3–3] Ashmead.

373. Signals and Systems for Hearing and Speech Sciences. A hands-on laboratory course that concentrates on applications for communications science. The course covers: (1) the fundamentals of analog signals, including the Fourier transform and representation of signals in the time and frequency domains; (2) the fundamentals of analog systems (filters), including representation in the time and frequency domains and the analysis of signals that pass through systems; (3) an introduction to digital signals and digital systems, including digital filter design; and (4) an introduction to MATLAB, a powerful tool for understanding and implementing signals and systems. SUMMER of odd-numbered years. [3] Grantham.

375. Seminar in Medical Audiology. Advanced study at the doctoral level of the medical aspects of audiology and the relationship of audiology to otology and neuro-otology. May be repeated for credit. Prerequisite: consent of instructor. [Variable credit: 1–3] (Not currently offered)

377. Seminar in Speech Perception. The study of the processes and models underlying the perception of speech features. Relevant acoustic correlates for speech perception will be evaluated, and these properties will be emphasized through the generation of synthetic speech. The course will cover the contributions of speech perception research to our understanding of speech development, and language and hearing disorders. SPRING. [3] Ohde.

379. Advanced Seminar in Audiology. A doctoral-level course focusing on special topics of interest to faculty and students based on recent research developments in audiology. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING. [3] Staff.

380. Advanced Seminar in Speech Pathology. A doctoral-level course focusing on special topics of interest to faculty and students and based on recent research developments in speech pathology. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING, SUMMER. [3] Staff.

381. Advanced Seminar in Language. A doctoral-level course focusing on special topics of interest to faculty and students and based on recent research developments in language. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING, SUMMER. [3] Staff.

382a–382b. Seminar: Research in Audiology. An advanced study of research for the second-year doctoral student. Directed individual research culminating in oral presentation and a manuscript. Prerequisite: consent of instructor. [2–2] (Offered on demand)

383. Practicum Case Conference. This course includes attendance at weekly case conferences where clinical case studies will be presented. The grade for this class will include clinical performance and attendance. FALL, SPRING, SUMMER. [1] Hale and Ricketts.

385. Instrumentation for Hearing and Speech Sciences: Stimulus Generation, Measurement, and Calibration. A hands-on introduction to the principles and techniques of setting up equipment for hearing and speech perception experiments. Students are exposed to analog generators (noise generators, function generators, oscillators, computer-controlled digital-to-analog converters) processing devices (attenuators, filters, mixers, amplifiers), terminating devices (earphones, loudspeakers, analog-to-digital converters), and measurement devices (oscilloscope, voltmeter, spectrum analyzer). Students will learn to design and implement circuits involving these various devices, and to measure and calibrate various kinds of acoustic stimuli. Offered on request. [3] Grantham.

386. Instrumentation for Hearing and Speech Sciences: MATLAB Programming with Real-Time Applications. An introduction to the standard MATLAB computing language in a Windows environment. Basic programming concepts including data types and storage, data input and output, conditional execution, iterative programming, and the use of functions. The goal is for the student to become sufficiently comfortable with MATLAB (and with the concept of programming languages in general) to develop programs to solve specific computational problems too tedious to solve by calculator. The last third of the course will be devoted to the application of MATLAB programming to real-time laboratory problems. Prerequisite: 385. Offered on request. [3] Grantham.

387. Spatial Hearing. An advanced treatment of the perception by humans of auditory objects in space, including laboratory demonstrations. Topics include (1) binaural processing (lateralization, binaural detection); (2) localization and spatial resolution in the free-field; (3) auditory distance perception; (4) the precedence effect: localization in reverberant spaces; and (5) the central auditory nervous system: binaural pathways. Prerequisite: 328 or permission of instructor. [3]

388. Independent Study and Readings in Speech Pathology. FALL, SPRING, SUMMER. [3]

389. Independent Study and Readings in Audiology. FALL, SPRING, SUMMER. [3]

398. Preliminary Doctoral Research. [0]

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

History

CHAIR Daniel H. Usner Jr.
DIRECTOR OF GRADUATE STUDIES Richard J. M. Blackett
PROFESSORS EMERITI Howard L. Boorman, Paul K. Conkin, Charles F. Delzell, Jimmie L. Franklin, Paul H. Hardacre, J. León Helguera, Robert Isherwood, Samuel T. McSeveney, Frederick D. Schneider, V. Jacque Voegeli, Donald L. Winters
PROFESSORS Jeremy Atack, Michael D. Bess, Richard J. M. Blackett, Dennis C. Dickerson, Marshall C. Eakin, James W. Ely Jr., James A. Epstein, Gary Gerstle, Elizabeth Lunbeck, Thomas Alan Schwartz, Helmut W. Smith, Daniel H. Usner Jr., David Wasserstein
ADJUNCT PROFESSOR Ronald A. Messier
ASSOCIATE PROFESSORS William Caferro, David Lee Carlton, Katherine B. Crawford, Gerald Figal, Joel F. Harrington, Yoshikuni Igarashi, Jane Gilmer Landers, Matthew Ramsey, Ruth Rogaski, Arleen M. Tuchman, Francis W. Wcislo
ASSISTANT PROFESSORS Brandi Brimmer, Devin Fergus, Catherine Molineux, Moses Ochonu, Rowena Olegario, Frank Robinson, Edward Wright-Rios
VISITING ASSISTANT PROFESSOR Henning Grunwald
SENIOR LECTURERS Yollette Trigg Jones, Peter Lorge

DEGREES OFFERED: *Master of Arts, Master of Arts in Teaching, Doctor of Philosophy*

❧ A THESIS is required for the master's degree in history; students specializing in continental European or Latin American history must achieve reading competence in one foreign language.

The Ph.D. degree program includes at least 45 hours of formal course work. A reading knowledge of one foreign language is required. Students specializing in continental European or Latin American history must demonstrate a reading knowledge of one or more additional languages essential to their research.

Certain courses offered by other programs and by the Law School may be accepted for credit toward the degree. Additional details are available in the office of the director of graduate studies.

Students are generally expected to enroll in 300-level courses.

201. Twentieth-Century African American Religious History . Pentecostalism, gospel blues, effect of urbanization and industrialization on black churches, religion in the civil rights movement, black power and black theology, women in religious institutions, and post-denominationalism. SPRING. [3] Dickerson.

202. Science and Society after the Enlightenment. The intellectual, philosophical, and social factors influencing the development of scientific theories since the Enlightenment. [3] Tuchman. (Not currently offered)

204. History of Medicine, 1750 to the Present. The scientific, technological, cultural, and professional factors influencing the rise of medicine. Emphasis on the period since about 1750 in both Europe and America. FALL, SPRING. [3] Tuchman, Rogaski.

205. Historical Perspectives on Women, Health, and Sexuality. Women as patients and healers. Emphasis on America. 1750 to the present. Topics include women's diseases and

treatments, changing definitions of "woman," sexuality , childbirth, birth control, abortion, midwives, nurses, and doctors. [3] Tuchman. (Not currently offered)

206. Medicine, Culture, and the Body. (Also listed as Anthropology 260) Concepts of the human body from historical and cr oss-cultural perspectives. Exploration of experiences, representations, and medical theories of the body in bir th, death, health, and illness in Western and non-W estern societies. Comparison of methodologies of anthr opology and history. [3] Conklin, Tuchman. (Not currently offered)

207. The Modern Human Sciences. Sciences of the human in the U.S. and Eur ope, 1870 to the present. Measurement and testing; classifications of human types by race, gender , and sexual orientation; institutional power and discipline; dif ferentiations of the nor mal and abnormal in psychology, psychiatry, medicine, sociology, anthropology, and sexology. [3] (Not currently offered)

210. Marriage and the Family in the Middle Ages. Evolution from late antiquity to the later Middle Ages. Topics include: Roman, Germanic, and Christian influence; variations based on class; gender roles; children and attitudes toward marriage as a template for other r elations. [3] (Not currently offered)

211. Medieval Women: Late Antiquity to the Later Middle Ages. Topics include the female body; social hierarchy and status; marriage vs. the cloister; women and work; female spiritu - ality; women as readers and writers. [3] (Not currently offered)

212. Medieval Europe, 300–1000. Rome, Latin Christendom, and the East; political events and the adaptation of Roman and Christian traditions to the needs of society emerging fr om the invasions. FALL. [3] Messier.

213. Medieval Eur ope, 1000–1350. Economic expansion and the for mation of national states; the medieval Chur ch and the r evival of lear ning in the twelfth and thir teenth centuries. SPRING. [3] Caferro.

214. Europe in the Age of the Renaissance. The political, social, economic, and religious history of Europe from 1300 to 1500, with particular emphasis on the intellectual aspects of the early Italian Renaissance. [3] Harrington. (Not currently offered)

215. Europe in the Age of the Reformation, 1500–1648. The political, intellectual, and social conditions underlying the Pr otestant revolt. The Refor mation of Luther, Calvin, Zwingli, Loyola, and other r eligious reformers considered within the context of the general developments of sixteenth-century history. [3] Harrington. (Not currently offered)

218. Europe in the Age of Revolution, 1789–1815. Political, cultural, and economic upheavals in the late eighteenth and early nineteenth centuries; the Fr ench Revolution and Napoleon, romanticism, and early industrialization. Emphasis on Britain, France, and Ger - many. [3] Ramsey. (Not currently offered)

220. Europe in the Nineteenth Century . Major political, social, economic, and cultural developments from 1815 to 1914. [3] (Not currently offered)

221. Sexuality and Gender in the Western Tradition to 1700. Politics, war, and masculin- ity; Christianity and sexuality; changing ideas about gender roles and sexual practices. No credit for students who have completed 185. [3] Crawford. (Not currently offered)

222. Sexuality and Gender in the Western Tradition since 1700. Politics, war, and masculin- ity, femininity, and gender roles; origins of identity politics and changing sexual norms; contem- porary feminist issues. No cr edit for students who have completed 186. [3] Crawfor d. (Not currently offered)

223. Medieval Sexuality. Topics include: original sin and ambivalence to sex; theories of gender, asceticism, the body, gay subculture. Emphasis on primary sources. [3] (Not currently offered)

225. Europe From World War I to World War II. Political, socioeconomic, cultural, and colonial history of Europe from 1914 to the fall of Hitler. [3] (Not currently offered)

226. Europe since 1945. 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] (Not currently offered)

231. History of Germany in the Twentieth Century. 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. No credit for students who have completed 230b. FALL. [3] Grunwald.

232. History of Modern Italy. Survey of Italian political, socioeconomic, cultural, and colonial history from 1800 to the present. The Risorgimento, national unification, Liberal Monarchy, Fascism, and the Republic. [3] Bess. (Not currently offered)

233. Medieval and Renaissance Italy, 1000–1700. 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." FALL. [3] Caferro.

234. History of France from the Renaissance to the Enlightenment. Social and cultural history from 1515 to 1774. The conditions of life, ambitions, ideas, and tastes of the various social groups in France. The development of the arts, music, and literature in a social and political context. [3] Crawford. (Not currently offered)

235. Modern France. From the French Revolution of 1789 to the present. Emphasis on politics, with some attention to the major economic, social, cultural, and intellectual developments. [3] Ramsey. (Not currently offered)

237. Russia: Tsardom to Empire. Russian history from fifteenth-century Muscovite state, society, and economy; orthodox Russian culture and religion; Peter the Great and Catherine the Great; eighteenth century absolutism, empire, serfdom, and intellectual life. [3] Wcislo. (Not currently offered)

238. 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] Wcislo. (Not currently offered)

239. 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] Wcislo. (Not currently offered)

240. Medieval and Early Modern England. Cultural, political, legal and religious developments in England from its Romano-Celtic antecedents through the seventeenth century. [3] (Not currently offered)

242. England under the Tudors. Political, religious, and cultural history of England from Henry VII's accession to the death of Elizabeth I. Emphasis on the Protestant Reformation and its effects; the interaction between monarchy and parliaments; Puritans and other dissenters; Elizabethan literature, drama, art, and music; popular culture; and the witch craze. [3] (Not currently offered)

243. Britain's Century of Revolution. Politics, religion, and culture of the British Isles in the seventeenth century. Analysis of the Civil War, Republic and Cromwellian Protectorate, Restoration, Glorious Revolution, and the political theory sparked by these conflicts, including works of Milton and Marvell, Hobbes and Locke; arts and literature; scientific revolution and intellectual change; witch craze; beginnings of empire. [3] (Not currently offered)

245. Victorian England. Cultural values, liberal reform; urbanization; women and gender; imperialism. SPRING. [3] Epstein.

246. The Asian Economic Miracle. Global economic growth of the Asian Pacific region from the 1950s to the present, including repercussions of the 1997 crashes. Asian economic patterns, effect of national and regional growth on class and ethnic differences, role of state planning in economic development. [3] Staff. (Not currently offered)

247. Themes in Modern Chinese History. Intensive reading, discussion, and short papers on selected themes in Chinese social and cultural history. Particular topics vary from semester to semester. May be taken more than once if there is no overlap with a prior offering. [3] Lorge. (Not currently offered)

248. History of Chinese Medicine. The historical divergences between medicine in China and the West. Readings in Chinese medical classics, including the *Inner Cannon of the Yellow Emperor* and early herbal manuals. Chinese medicine's encounter with Western medicine in the twentieth century: the creation of "Traditional Chinese Medicine" in the PRC and the emergence of Chinese medicine as "alternative medicine" in the U.S. SPRING. [3] Rogaski.

249. History of Modern Japan. The political, social, economic, and cultural history of Japan in the nineteenth and twentieth centuries. Radical changes in the state, society, and economy and the effects of these changes on Japan's place in the world. SPRING. [3] Igarashi.

250. Cultural and Social History of Japan's Recent Past. Japanese culture and society from the 1930s to the present. Impact of war experiences on postwar Japan, and the political nature of cultural production. [3] Igarashi. (Not currently offered)

253. Subsaharan Africa: 1400–1800. 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. FALL. [3] Ochonu.

254. Africa since 1800: The Revolutionary Years. 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. SPRING. [3] Ochonu.

255. The Islamic World to 1798. History of the Islamic world, sixth century A.D. to 1789. The rise and spread of Islam as a world empire, a religious system, a cultural-economic network, and a way of life. Historical and literary sources and artifacts. SPRING. [3] Messier.

256. Nationalism and Islam in the Middle East since 1798. Secular nationalism and the changing nature of Islamic identification in the Middle East with emphasis on Egypt, Turkey, Iran, and Palestine/Israel. [3] (Not currently offered)

257. Muhammad and Early Islam. 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] Wasserstein. (Not currently offered)

258. Rise of the Iberian Atlantic Empires, 1492–1700. Pre-Columbian societies; the formation of the early Spanish state and imperial expansion in the Americas; the formation of multiethnic transatlantic societies. FALL. [3] Landers.

259. Decline of the Iberian Atlantic Empires, 1700–1820. Reorganization of the Spanish and Portuguese empires, maturation of transatlantic societies; revolutions for independence. SPRING. [3] Robinson.

261. Colonial Mexico. The cultural history of major pre-Columbian groups; the conquest and settlement by the Spaniards; colonial society through independence in 1821. No credit for students who have completed 261a. [3] Landers. (Not currently offered)

262. Modern Mexico. From independence in 1821 to the present. Political instability of the nineteenth century; the Porfirian dictatorship and the revolution of 1910; evolution and modernization of Mexico. SPRING. [3] Wright-Rios.

263. History of Gender and Women in Colonial Latin America. Gender constructions and their historical effects on Spanish, Amerindian, African, and mixed-race women from 1400 to 1800. SPRING. [3] Landers.

264. Brazilian Civilization. From pre-Columbian times to the present. Clash and fusion of Portuguese, Amerindian, and African cultures; sugar and slavery; independence and empire; the coffee economy; race relations; the search for national identity; industrialization; dictatorship and democracy in the twentieth century. SPRING. [3] Eakin.

265. History of Central America. Iberian and Amerindian background, colonial society; independence; growth of the plantation economy; the United States' presence; political and social revolutions in the twentieth century. [3] Robinson. (Not currently offered)

266. Reform and Revolution in Latin America. 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. FALL. [3] Wright-Rios.

267. The Frontier in Early America: War and Cultural Interaction. Frontiers in North America, 1500–1763. War, trade, and cultural exchange among the native, British, French, and Spanish residents of North America. The meaning of cultural frontiers and of cycles of peace and war in borderlands. FALL. [3] Molineux.

268. The English Atlantic World, 1500–1688. English overseas expansion, including conquest of Ireland, exploration and conquest of the New World. Formation of imperial and American cultures and of racism, the slave trade, Indian relations, and migration from the British Isles. [3] Staff. (Not currently offered)

269. Cultural History of the First British Empire, 1707–1783. The creation of Great Britain; expansion of British overseas interests in America, Africa, Asia, and the Pacific; development of creole cultures; British imperial policy and transatlantic cultures; the American Revolution and growth of antislavery. [3] Staff. (Not currently offered)

270. Africa and the World. Africa's commercial, cultural, and political relations with other parts of the world, especially Western Europe and the United States in the last two hundred years. Impacts of key movements of global crises on these relations, economic depression of the 1870s, World War I, the Great Depression of the 1930s, World War II, and the Cold War and African responses to these crises. [3] Ochonu. (Not currently offered)

272. The U.S. in the Era of the Civil War. Sectional conflict, secession, the Southern War for Independence, and Reconstruction; 1850–1877. [3] Olegario. (Not currently offered)

273. The Civil Rights Movement. 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. SPRING. [3] Dickerson.

275. Recent America: The United States since 1945. A general study of the postwar period, with particular attention to the dynamics of social and political change. FALL. [3] Fergus.

276. The Old South. 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. FALL. [3] Carlton.

277. The New South. 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. SPRING. [3] Carlton.

278. History of Appalachia. 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] Carlton. (Not currently offered)

279. African American History to Reconstruction. The political, socioeconomic, and intellectual history of African American people from their African backgrounds to the end of Reconstruction. Special emphasis on the institutional history of the African American community. FALL. [3] Dickerson.

280. African American History since Reconstruction. 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. SPRING. [3] Fergus.

281. The U.S. and the Vietnam War. 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] Schwartz. (Not currently offered)

282. The U.S. and the World. From the winning of independence to the Great Depression. Relationships among foreign policy, ideology, domestic politics, and social and economic change. No credit for students who have completed 280a. [3] Schwartz. (Not currently offered)

283. The U.S. as a World Power. 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. No credit for students who have completed 280b. [3] Schwartz. (Not currently offered)

285. American Social History since 1865. The social causes and consequences of such events as Progressive Reform and the Great Depression. The impact of industrialization and urbanization on the elite, labor, immigrants, blacks, women, and the family. [3] (Not currently offered)

286. Gender, Sexuality, and Race in Early American Culture, 1600–1865. 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] (Not currently offered)

287. Gender, Sexuality, and Race in American Culture, 1865 to the Present. 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. SPRING. [3] Brimmer.

288. History of American Thought from the Puritans to the Civil War. Basic beliefs and preferences, with special emphasis upon Christian doctrine and political and economic theory. Understanding of the origins of a largely Christian, republican, and capitalist America. [3] Staff. (Not currently offered)

289. History of American Thought since 1865. Basic beliefs and preferences, with special emphasis upon Darwinian theory, the physical sciences, classic American philosophers, and the various and confusing intellectual fashions of the twentieth century. [3] (Not currently offered)

291. History of American Enterprise. (Also listed as Economics 245.) 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. FALL, SPRING. [3] Carlton, Olegario.

294. Selected Topics in History. SPRING. [3] Staff.

300a–300b. Introduction to Historical Methods and Research. [4–4] Usner, Smith.

301. The Art and Craft of Teaching History. Readings on pedagogical theory and current research on college-level teaching and learning. Hands-on exercises in course design, preparing and grading tests and assignments, lecturing, leading discussion, cooperative and service learning, and use of technology to enhance teaching. Normally limited to graduate students in History. FALL. [4] Eakin.

305. Studies in Comparative History. SPRING. [4] Blackett, Eakin.

309. Studies in the Philosophy of History. [4] (Not currently offered)

315a. Studies in Early Modern European History. [4] (Not currently offered)

317. The Long Reformation in Britain and America. Perceptions of Protestantism in post-Reformation England, Scotland, Anglo-Ireland, the Gaidhealtachd, and the British American colonies. Anthropology of religion and ritual; recent secondary historical literature; spiritual autobiographies, diaries, church court records, sermons. Optional instruction in early modern paleography. [3] (Not currently offered)

320a. Studies in European History, 1815–1914. FALL. [4] Epstein.

321. Topics in European History. [4] (Not currently offered)

324a. Studies in Recent European History. [4] (Not currently offered)

330a. Studies in German History. SPRING. [4] Smith.

340. Urban History. Theoretical approaches to the dynamics of urban life in different historical times and places. Topics of special interest include rural-urban linkages; merchants and the state; plebeian culture and patrician society; the languages of class and gender; the myths and rituals of marginality; race and ethnicity; and global metropolitanism. [4] (Not currently offered)

343a. Studies in Early Modern Britain. Readings on England, Scotland, and Ireland from 1450 to 1700, with emphasis on England and on politics, political theory, religion and culture. [4] (Not currently offered)

343b. Seminar in Early Modern Britain. Research and writing on England and Scotland from 1500 to 1700; introduction to early modern paleography. [4] (Not currently offered)

344a. Studies in Modern England. [4] (Not currently offered)

344b. Seminar in Modern England. [4] (Not currently offered)

350a–350b. History of Biography. A two-semester sequence course. Fall: art of biography; autobiography and biography; examination and analysis of major works in the nineteenth and twentieth century biography. Spring: entire semester devoted to the projection of a major biographical essay. [4] (Not currently offered)

358. Comparative Slavery in the Colonial Americas. Interdisciplinary and cross-cultural study of slavery and resistance in Spanish, British, French, Dutch, and Portuguese America. Does not cover antebellum slavery in the United States. [4] Landers. (Not currently offered)

359. Atlantic World History, Fifteenth to the Nineteenth Century. Interdisciplinary readings examining disparate colonizations and the creation of an Atlantic world system. Major themes include the consequences of Atlantic expansion on indigenous societies, the African slave trade, and the rise of Atlantic economics, the circulation of peoples, ideas, and material culture throughout the Atlantic and how imperial competition, political ideologies, and subaltern resistance shaped the Atlantic revolutions. Optional instruction in early modern paleography. [4] Landers. (Not currently offered)

360. Studies in Imperialism and the Colonial Other. The focus will be on representations of the other in European and American literary, cultural, and historical discourses; historical conditions that have produced various images of the colonial other, and recent criticisms of imperial colonial conditions. [4] (Not currently offered)

361. Topics in Latin American History. FALL. [4] Wright-Rios.

362. History of Gender and Women in Colonial Latin America. Interdisciplinary and cross-cultural study of the history of gender and its impact on Spanish, Indian, and African women in colonial Latin America. Major topics include gender and family roles, women's work and economy, legal and social statuses of distinct groups of women and related issues of social control, and the religious and public lives of women. [4] Landers. (Not currently offered)

365. Seminar in Latin American History. [4] Landers. (Not currently offered)

369. Master's Thesis Research. [0]

371a. Studies in Early American History to 1783. [4] Usner. (Not currently offered)

372a. Studies in the Middle Period of American History, 1783–1861. [4] (Not currently offered)

373a. Studies in U.S. History, 1861–1900. [4] Dickerson. (Not currently offered)

374. Studies in Recent American History. SPRING. [4] Fergus.

375. Seminar in Recent American History. [4] Dickerson. (Not currently offered)

378a. Studies in the History of the South. [4] Carlton. (Not currently offered)

380a. Studies in American Diplomatic History. SPRING. [4] Schwartz.

381. Topics in American History. FALL. [4] Dickerson.

384a. Studies in American Social History. [4] (Not currently offered)

384b. Seminar in American Social History. [4] (Not currently offered)

385a–385b. Studies in the Intellectual History of the United States. [4–4] (Not currently offered)

386a. Studies of Women in the United States. [4] (Not currently offered)

390a–390b. Independent Study. [Variable credit: 1–3 each semester]

398. Dissertation Seminar. FALL, SPRING. [3] Tuchman, Olegario.

399. Ph.D. Dissertation Research. FALL, SPRING. [3] Tuchman, Olegario.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

History of Art

CHAIR Christopher M. S. Johns
DIRECTOR OF GRADUATE STUDIES Leonard Folgarait
PROFESSORS EMERITI Robert A. Baldwin, Thomas B. Brumbaugh, F. Hamilton Hazlehurst, Milan Mihal, Ljubica D. Popovich
PROFESSORS Leonard Folgarait, Vivien Green Fryd, Christopher M. S. Johns
ASSOCIATE PROFESSORS Robert L. Mode, Barbara Tsakirgis
ADJUNCT ASSOCIATE PROFESSOR Susan Edwards
ASSISTANT PROFESSORS James J. Bloom, Annabeth Headrick, Jinah Kim, Tracy Miller, Elizabeth J. Moodey
LECTURER Claire S. King

DEGREE OFFERED:
ART HISTORY. *Master of Arts*

THE faculty in art history gives special attention to breadth of coverage and period continuity. Both Western and non-Western traditions are included, with particular emphasis on medieval to baroque art and early modern to contemporary art in Europe and America. A research collection, the Contini-Volterra Archive, is housed in the library and contains thousands of photographs presenting a thorough documentation of painting in Italy and elsewhere from the thirteenth through the eighteenth centuries.

The department stresses the interrelationship of history, anthropology, classics, philosophy, religion, and many of the social sciences. Members of the faculty represent different approaches to the field, encouraging diversity in the art history graduate program. For courses in other departments that might be appropriate (such as Classics 203, 204, 205, 206, and/or 217), check with the director of graduate studies. Students must take 30 credit hours, pass foreign language exams in German plus area of concentration, and write a thesis.

210. Early Christian and Byzantine Art. The development of architecture, sculpture, painting, and the minor arts from the fourth through the fifteenth century. [3] (Not currently offered)

211. Medieval Art. The development of architecture, sculpture, painting, and the minor arts in Europe from the eighth through the fourteenth century. FALL. [3] Moodey.

212. Northern Renaissance. Painting, sculpture, and graphic arts in the Low Countries, France, and Germany from the end of the fourteenth century through the Reformation. Historical, social, and religious factors are considered as well as style. FALL. [3] Bloom.

215. Formation and Power of Christian Images. Iconographic analysis of the origins and evolution of single figures and compositions: their religious and political messages in painting and sculpture of the Middle Ages from circa 300 to 1300. [3] (Not currently offered)

218. Italian Renaissance Art to 1500. Early development of painting and sculpture through the fourteenth century and into the full Renaissance style of Italian art, as manifest in the works of Giotto, Masaccio, Donatello, and Botticelli. Emphasis is placed on the age of the Medici. FALL. [3] Mode.

219. Italian Renaissance Art after 1500. 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. SPRING. [3] Mode.

220. Renaissance-Baroque Architecture. European architecture from the fifteenth century to the French Revolution, with emphasis on its historical and social background. The various architectural movements—Renaissance, Baroque, and Rococo—are studied in terms of important architects and buildings, especially of Italy, France, and England. [3] (Not currently offered)

221. Baroque-Rococo Art. European painting from 1550 to the French Revolution, encompassing the Mannerist, Baroque, and Rococo movements as they are manifested in the works of Caravaggio, Velasquez, Rembrandt, Watteau, Hogarth, and Tiepolo. [3] Johns, Bloom. (Not currently offered)

222. British Art. The arts of England and related cultures, from Van Dyck and Hogarth to Blake and the Pre-Raphaelites. Social and political context, literary influences, and film treatments. SPRING. [3] Mode.

224. Eighteenth-Century Art. 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] Johns. (Not currently offered)

226. Neoclassicism and Romanticism. 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] Johns. (Not currently offered)

230–231. Nineteenth- and Twentieth-Century European Art. A survey of painting and the graphic arts, with some consideration given to social and historical factors. 230: from Neo-Classicism through Post-Impressionism; 231: from the early expressionist movements to midcentury. FALL, SPRING. [3–3] Folgarait, Staff.

232. Modern Architecture. 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] Folgarait. (Not currently offered)

234. Twentieth-Century Mexican Literature, Film, and Art. The historical, social, and political dynamic as expressed in various art forms. The relation between social reality and aesthetic form. [3] Folgarait. (Not currently offered)

240. American Art to 1865. Painting, sculpture, and architecture of the United States from Colonial times to 1865 with emphasis on iconography, social history, race, and gender. FALL. [3] Fryd.

241. American Art 1865 to 1945. 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] (Not currently offered)

242. Art since 1945. A survey of art produced in the United States and Europe since 1945 with emphasis on theory and social and intellectual factors. SPRING. [3] Fryd.

251. East Asian Architecture and Gardens. 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. FALL. [3] Miller.

252. Arts of China. Artistic production from the Neolithic period through the Zing dynasty in relation to religious and cultural contexts. FALL. [3] Miller.

253. Arts of Japan. Artistic production from the Neolithic through Meiji periods in relation to religious and cultural contexts. SPRING. [3] Miller.

254. Japanese Painting and Prints. A survey of Japanese painting from the protohistoric period to the present, with an emphasis on schools, styles, and development of woodblock prints, as seen in their historical, religious, and cultural context. [3] Miller. (Not currently offered)

255. Native North American Art. The art and great aesthetic traditions of the native peoples, emphasizing North America, including the Southwest, Northwest Coast, and the Plains. The relationship of art to social life, myth, and religion. Changes since contact with European cultures. SPRING. [3] Headrick.

256. Art of the Maya. Architecture, painting, and sculpture from 100 B.C. to artistic traditions of contemporary Maya peoples. Ritual, religion, mythology, and politics. SPRING. [3] Headrick.

257. Mesoamerican Art. Worldview as expressed by painting, sculpture, and architecture from 2000 B.C. through the sixteenth century. Impact of religion and politics on the cities of the Olmec, Zapotec, and Aztec as seen through their artistic traditions. FALL. [3] Headrick.

288. Selected Topics. May be repeated with change of content up to a total of 9 hours. [3] Staf.

289. Independent Research. Supervised work in extension of regular offerings in the curriculum. Registration only with agreement of instructor involved. FALL, SPRING. [Variable credit: 1–3 per semester; not to exceed a total of 6] Staff.

290. Directed Study. Supervised participation in research. FALL, SPRING. [Variable credit: 1–3 per semester, not to exceed a total of 6] Staff.

301. The Methods of Art History. Comparative analysis of art historical methods including social history, post-structuralism, feminism, gender studies, stylistic analysis, and iconography. Assessment of methods in action through critiques and exercises in independent application. [3] Folgarait, Fryd. (Not currently offered)

310. Seminar: Issues in Asian Art. [3] Miller. (Not currently offered)

312. Seminar: Problems in Medieval Architecture. [3] (Not currently offered)

315. Seminar: Early Renaissance Art. [3] Mode. (Not currently offered)

319. Seminar: Problems in Baroque Art. [3] Johns, Bloom. (Not currently offered)

320. Seminar in British Art and Culture. [3] Mode. (Not currently offered)

321. Problems in Eighteenth-Century Art. [3] Johns, Mode.

324. Seminar: Studies in Twentieth-Century Art. [3] Folgarait. (Not currently offered)

325. Seminar: Studies in American Art. [3] Fryd. (Not currently offered)

355. Seminar: Mesoamerican Art. [3] Headrick. (Not currently offered)

369. Master's Thesis Research. FALL, SPRING. [0–6] Staff.

Human Genetics

DIRECTOR Scott M. Williams
DIRECTOR OF GRADUATE STUDIES Scott M. Williams
PROFESSORS Judy Aschner, Michael Aschner, H. Scott Baldwin, Randy D. Blakely, Kendal Broadie, Ellen Wright Clayton, James Crowe, Ellen Fanning, Sergio Fazio, Al George, Jonathan L. Haines, Pat Levitt, Macrae Linton, David McCauley, John A. Phillips III, Dan Roden, Arnold Strauss
ASSOCIATE PROFESSORS Thomas Aune, Ela Knapik, James Patton, Lilianna Solnica-Krezel, Marshall Summar, James S. Sutcliffe, George Tiller, Scott M. Williams, Laurence J. Zwiebel
ASSISTANT PROFESSORS Jeff Canter, Katherine Friedman, Rizwan Hamid, Tsutomui Kume, Chun Li, Douglas Mortlock, Deborah Murdock, Richard Nass, Marylyn D. Ritchie, Michelle Southard-Smith, Jeffrey Smith

DEGREE OFFERED: *Doctor of Philosophy*

❧ THE overall goal of the Human Genetics Ph.D. degree program is to provide students with a solid foundation for a career in genetics research and teaching. Training is available in human genetic analysis and in genetic analysis of model systems that contribute to our understanding of human disease. The training combines a prescribed set of basic courses intended to ground students in the fundamentals of genetic analyses, the basics of human genetics, a set of elective courses designed to meet individual needs, and a rigorous research experience that will contribute to the field of genetics. Students completing the requirements of the Ph.D. program in Human Genetics will have demonstrated mastery of knowledge in genetics and contributed substantial and original scientific knowledge to the field.

Ph.D. students in Human Genetics are required to complete a minimum of 29 credit hours of formal course work, consisting of 23 hours of required course work and 6 hours of electives. One of the required courses will be a statistics course to be chosen from several currently available on campus and approved by the program faculty. Students will take a minimum of 6 hours of didactic classes per semester during their first two years of study. It is expected that during the second year at least one semester will exceed this minimum in order to complete the required courses prior to year 3 of study. The electives come from an approved list of advanced genetics courses and the choice of these courses will be based on the individual student's research interests.

Students may take one of two paths in their training. These paths diverge in the spring semester of the second year when it is expected that students who are more focused on population and/or statistical genetics will opt for courses that emphasize statistical and population approaches and students more interested in functional studies will take courses that emphasize molecular genetics/genomics.

For additional information, see *http://chgr.mc.vanderbilt.edu/chgrsite/PhD.htm*.

320. Human Genetics. Research/techniques in human genetics. By arrangement. [Variable credit]

340. Human Genetics I. Designed to cover background and latest advances in human genetics. Topics will include an overview of mutational mechanisms, cytogenetics (detection and description of chromosomal abnormalities), biochemical genetics (gene defects in biochemical pathways), molecular genetics (gene structure, function, and expression), population genetics (heritability, quantitative traits, variance analysis), disease gene discovery (study design, statistical and molecular techniques), and genetic epidemiology (genetic linkage analysis, association studies, gene-gene and gene-environment interaction). Topics will be discussed with reference to specific human genetic diseases. FALL. [3] Summar and Staff.

341. Human Genetics II. This course will cover the statistical, population, and analytical aspects of modern human genetics research. Topics to be covered include human population genetics, quantitative genetics, linkage and association analyses, computational genetics, and evolutionary genetics. Clinical examples, subject ascertainment, and study design will also be emphasized. Students must have a strong understanding of Mendelian genetics and basic biostatistics. Prerequisite: permission of instructor. SPRING. [3] Haines and Staff.

349. Genetics of Model Organisms. Basic genetic principles across a broad range of organisms (yeast, C. elegans, Drosophila, Arabidopsis, mouse, zebrafish) that are used to investigate molecular and developmental pathways of interest for human disease will be presented. This course focus will provide students with in-depth terminology and understanding of the advantages, applications, and approaches specific to each organism. Genomic and bioinformatics tools that facilitate genetic analysis in each species will be emphasized. Specific examples of how each model organism has successfully contributed to defining a human disorder will be presented. Course combines faculty lectures with discussion of original articles and hands-on computer time for demonstration of statistical packages. SPRING. [2] Southard-Smith and Staff.

370. Tutorials in Human Genetics. A weekly seminar critically evaluating current and past scientific literature from many areas of genetic research. The focus will be on study methods and analysis. FALL. [1] Canter.

371. Tutorial in Statistical and Population Genetics. The class meets once weekly. Graduate students critically evaluate research publications in areas statistical methods in human genetic analysis and in the area of human population genetics. Also, there are faculty presentations on ancillary science skills, such as oral and poster presentations, and grant and proposal writing. SPRING. [1] Li, Ritchie.

385. Fundamentals of Genetic Analysis. This course is designed to accomplish three goals: (1) introduce students to critical topics of genetic research, (2) introduce students to important areas of genetic research not covered in first-year course work, and (3) promote an understanding of classical genetic analysis by learning genetics using the original literature. The approach will be to use classic literature that defined significant problems in genetic research. Specific topics will include: genetic analysis (segregation, independent assortment and locus mapping), human pedigree analysis and disease gene mapping, and population/quantitative genetics. FALL. [4] Williams and Staff.

399. Ph.D. Dissertation Research. [Variable credit] Staff.

Interdisciplinary Materials Science

DIRECTOR James E. Wittig
ASSOCIATE DIRECTOR Charles M. Lukehart
DIRECTOR OF GRADUATE STUDIES James E. Wittig
PROFESSORS EMERITI Robert J. Bayuzick, William F. Flanagan, Tomlinson Fort, George T. Hahn, Donald L. Kinser, Barry D. Lichter, James J. Wert
PROFESSORS Peter Cummings, Jimmy L. Davidson, Leonard C. Feldman, Daniel M. Fleetwood, Kenneth F. Galloway, Richard F. Haglund, Weng Poo Kang, Paul Laibinis, Charles M. Lukehart, Lloyd Massengill, Sokrates T. Pantelides, Ronald D. Schrimpf, Alvin M. Strauss, Norman Tolk, Taylor G. Wang, Robert A. Weller
RESEARCH PROFESSOR EMERITUS Robert A. Weeks
ADJOINT PROFESSOR James Bentley
ASSOCIATE PROFESSORS Todd D. Giorgio, Timothy P. Hanusa, Frederick R. Haselton, Tobias Hertel, G. Kane Jennings, Piotr Kaszynski, Bridget R. Rogers, Sandra Rosenthal, James E. Wittig, David W. Wright
RESEARCH ASSOCIATE PROFESSORS A. V. Anilkumar, Anthony Hmelo
ASSISTANT PROFESSORS David E. Cliffel, James Dickerson, Eva Harth, Deyu Li, Clare McCabe, Harold Park, Ilias Perakis, Florence Sanchez, Kalman Varga, Greg Walker, Sharon Weiss, L. Roy Xu
ADJUNCT ASSISTANT PROFESSOR Robert H. Magruder III

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

FIELDS of study: Electronic materials, magnetic materials, superconducting materials, nanostructured materials, molecular engineering and science, surface and interface science, thin films, surface modification, radiation effects in solid state devices, organic-based devices, materials synthesis, solidification, materials characterization, materials physics.

In general, materials advancements improve the standard and the quality of living. They are indeed the underpinning of the development of new technologies. In today's sophisticated and complicated climate, continued advancements in materials demand intimacy among a variety of disciplines. In recognition of this at Vanderbilt University, faculty from departments of Chemistry, Physics, Materials Engineering, Chemical Engineering, Electrical Engineering, Mechanical Engineering, and Civil Engineering have come together in the Interdisciplinary Program in Materials Science. In this arena, there is extensive collaboration in both the teaching of and research in materials science.

The richness of the research activities within the program is a reflection of the richness of the education offered within the program. Many research areas focus on electronic/optical thin films, nanostructures, and the interaction of intense optical radiation with matter. Electronic and optical thin films are at the forefront of materials science and span the range from semiconductor applications to biomedical materials. Ion bombardment processes and their role in the creation of new materials is a central area of research within the program. Some of the current experimental activity embraces the creation of defect complexes in silicon and the dynamical

interaction of these defects with the lattice phonons. Other ion bombardment programs involve the creation of unique microstructures by ion implantation and the understanding of such processes. Additional initiatives within the program concentrate on research regarding molecular electronics, seeking new materials systems and fundamental processes to form electronically active elements on the molecular size level. There is also a wide range of materials synthesis activities for the formation of innovative materials such as molecular precursors for thin-film chemical-vapor-deposition, molecules for optoelectronic and magnetic applications, novel liquid crystals, semiconducting nanocrystals, nanocomposites, sol-gel ceramics and photovoltaics. Still another predominant set of investigations studies the effect of radiation on the performance of advanced integrated circuit systems in the space environment. Some other examples of research projects include diamond deposition processes with emphasis on structure and properties, novel production processes for high temperature superconductors, and solidification processes for the development of high performance structural materials.

The M.S. degree in materials science requires a minimum of 24 semester hours (beyond the baccalaureate) of formal course work plus a thesis. Nine semester hours are a selection of three of the four core program courses. The core courses are CHEM 330, Thermodynamics and Kinetics of Organic and Inorganic Materials; CHEM 350 Materials Chemistry; MSE 310, Atomic Arrangements in Solids; and PHYS 254, Physics of Condensed Matter. Six additional hours are taken from the approved list of interdisciplinary program courses. A minor consisting of 6 semester hours is chosen in a separate but related field. The remaining 3 hours are an elective selected from either interdisciplinary program offerings or a related field.

The Ph.D. degree in materials science requires a total of 72 semester hours (beyond the baccalaureate) plus a dissertation. Within the requirement are 24 semester hours from the approved list of interdisciplinary program courses of which 12 hours is the core curriculum. The intent of these courses is to complement the student's technical interests. The remaining 36 semester hours may be in research dissertation hours.

The master of engineering, an advanced professional degree for engineers, is offered by the School of Engineering.

CE 295. Mechanics of Composite Materials. 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 182 and MSE 150. SPRING. [3]

CHE 284. Semiconductor Materials Processing. This course introduces the unit operations of semiconductor materials processing applied to silicon device manufacturing. We will cover some basic semiconductor physics and device theory, the production of silicon substrates, dopant diffusion, ion implantation, thermal oxidation and deposition processes,

plasma deposition processes, photolithography, wet chemical and plasma etching, and analytical techniques. FALL [3] Rogers.

CHE 290. Molecular Aspects of Chemical Engineering (Special Topics). An introduction to the concepts of materials design from a chemical perspective. Basic principles of covalent and ionic bonding, intermolecular interactions and their effects on the properties of liquids and solids. Manipulating the macroscopic properties of chemical systems by molecularly engineering their "active" components. Molecular design. Applications in biomaterials, membrane technology, colloids, and surface science. Prerequisite: consent of instructor. SPRING [3] Jennings.

CHE 320. Surfaces and Adsorption. Surface energy, capillarity, contact angles and wetting, surface films, insoluble monolayers, solid surfaces, membranes, surface area determination, adsorption, adhesion, interface thermodynamics, friction and lubrication, interfaces in composites, relationships of surface to bulk properties of materials. FALL. [3] Fort.

CHE 325. Polymer Sciences and Engineering. Macromolecular systems with emphasis on the interrelationship of chemical, physical, and engineering properties and the further relation of these properties to synthesis and application. A basic understanding of organic and of physical chemistry is assumed. [3] (Not currently offered)

CHEM 235. Surface and Polymer Chemistry. Spectroscopic methods for studying surfaces, with emphasis on polymer systems. Prerequisite: CHEM 230. [3] (Not currently offered)

CHEM 312. Electrochemistry: Theory and Analysis. FALL. [3] Cliffel. (Offered in alternate years)

CHEM 330a. Quantum Chemistry I. Limits of classical mechanics at the atomic and molecular level; the postulates of quantum mechanics applied to problems in one, two, and three dimensions; perturbation and various methods. Prerequisite: CHEM 232 and MATH 223ab or MATH 222–229. SPRING. [3] Polavarapu.

CHEM 330b. Quantum Chemistry II. Advanced topics in the application of quantum mechanics to chemical bonding and spectroscopy. Prerequisite: CHEM 330a. [3] (Not currently offered)

CHEM 331. 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: CHEM 232. FALL. [3] Schaad.

CHEM 335. Thermodynamics and Kinetics of Organic and Inorganic Materials. Equilibrium in chemical and physical processes of ideal and real systems. Reaction rates for elementary mechanisms. SPRING [3]. Schaad.

CHEM 350. Materials Chemistry. A survey of modern materials chemistry with an emphasis on the chemistry related to the preparation, processing, identification, analysis, and applications of materials. FALL [3]. Lukehart.

ECE 283. Principles and Models of Semiconductor Devices. 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: ECE 235 or consent of instructor. SPRING. [3] Kang.

ECE 284. Integrated Circuit Fabrication and Technology. Introduction to monolithic integrated circuit technology. Understanding of basic semiconductor properties and processes that result in modern integrated circuit. Bipolar and MOSFET processes and structures. Elements of fabrication, design, layout, and applications as regards semiconductor microelectronic technologies. Prerequisite: ECE 235 or consent of instructor. SPRING. [3] Davidson.

ECE 301. Introduction to Solid State Materials. The properties of charged particles under the influence of an electric field, quantum mechanics, particle statistics, fundamental particle transport, and band theory of solids will be studied. FALL. [3] Weller.

ECE 302. Electric and Magnetic Properties of Solids. Fundamentals of the electrical and magnetic properties of solids. Dielectric and magnetic properties are discussed. Prerequisite: ECE 301 or equivalent. SPRING. [3] Weller.

ECE 305. Topics in Applied Magnetics. Selected topics in magnetism, magnetic properties of crystalline and noncrystalline materials; ferrite materials for electronics and microwave applications, resonance phenomena. Prerequisite: ECE 302 or consent of instructor. [3] (Offered on demand)

ECE 306. Solid-State Effects and Devices I. 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. SPRING. [3] Schrimpf.

ECE 307. Solid-State Effects and Devices II. The structure of solids, phonons, band theory, scattering phenomena, and theory of insulators. [3] (Offered on demand)

IMS 320. Nanoscale Science and Engineering. A multidisciplinary approach to the study of the fundamentals uniquely pertaining to the processing, structure, and performance of materials on the dimensional scale of tens to hundreds of atoms. The science and engineering of nanomaterials. Methods for synthesis and fabrication, techniques for characterization, and the attainment of special properties at the nanoscale. An examination of present and future applications in biotechnology, medicine, and engineering. FALL. [3] Jennings and Staff.

ME 365. Special Topics in Heat Transfer. Topics such as boiling, condensation, ablation and heat transfer in MHD flows, rarefied gases, and two-phase flows are studied. Prerequisite: ME 363, ME 364. [3]

MSE 250. Materials Science II. Combines a physical chemistry approach with development of concepts of microstructures applied to ceramics, glasses, metals, semiconductors, polymers, and composites. Includes a brief survey of relevant areas of thermodynamics and kinetics; phase equilibria; characterization of phases; diffusion, solidification, and resulting structure and properties; solid-state transformations; synthesis and modern processing techniques. Prerequisite: MSE 150. SPRING. [3] Bayuzick.

MSE 310. Atomic Arrangements in Solids. A basic understanding of the atomic arrangements observed in metals, ceramics, semiconductors, glasses, and polymers. Lattice geometry and crystal symmetry are discussed in detail and these concepts are used to describe important crystal structures. Nanocrystalline materials are also covered. An introduction to scattering theory and diffraction phenomena provides insight into the analytical methods used by materials scientists for structural characterization. FALL. [3] Wittig.

MSE 343. Introduction to Electron Microscopy. 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. Prerequisite: consent of instructor. FALL [3] Wittig.

MSE 369. Master's Thesis Research. FALL, SPRING. [0] Staff.

MSE 391–392. Special Topics. Based on faculty research projects and highly specialized areas of concentration. FALL, SPRING. [Variable credit: 1–3 each semester] Staff. 392, Weller.

MSE 397–398. Seminar. A required noncredit course for all graduate students in the program. Topics of special interest consolidating the teachings of previous courses by considering topics that do not fit simply into a single course category. FALL, SPRING. [0–0] Staff.

MSE 399. Ph.D. Dissertation Research. FALL, SPRING. [0–12] Staff.

PHYS 223. Thermal and Statistical Physics. 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. FALL. [3] Webster.

PHYS 225a–225b. Introduction to Quantum Physics and Applications. A survey of modern physics using elementary quantum mechanics. 225a: Atomic and molecular structure and spectroscopy. Solid state physics. 225b: Nuclear structure decay and reactions. Properties and classifications of elementary particles. Recommended: Math 198. F ALL. [4–4] Albridge and Csorna.

PHYS 251a–251b. Introduction to Quantum Mechanics. Wave-particle duality, indeterminacy, superposition, the Schrödinger equation, angular momentum and scattering, perturbation theory. Prerequisite: PHYS 225a and PHYS 227a. Recommended: MATH 2429. FALL. [3–3] Green and Tolk.

PHYS 254. Physics of Condensed Matter. Crystal structure and diffraction; phonons and lattice vibrations; free-electron theory of metals; elementary band theory of solids; semiconductors; optical properties of insulators; and applications to solid-state devices, magnetism, and superconductivity. Prerequisite: PHYS 223, PHYS 225a, and PHYS 227b. SPRING. [3] Feldman.

PHYS 330a–330b. Quantum Mechanics. Wave and matrix forms of the theory, transformation theory, theory of angular momentum, systems of indistinguishable particles, approximate methods of solution, energy levels and scattering processes, and introduction to relativistic quantum mechanics. Prerequisite: PHYS 251, MATH 292. [3–3] Ernst and Perakis.

PHYS 341. Statistical Mechanics. Phase space, entropy and reversibility; ensemble theory; Fermi and Bose Statistics; systems of interacting particles; equation of state, critical phenomena, and phase transitions; pairing and superfluidity. SPRING. [3] Gittes.

PHYS 354a–354b. Condensed Matter Theory. Free-electron theory of metals; elementary band theory of solids; quantum theory of the harmonic crystal; elementary excitations; optical properties of materials; electronic basis of magnetic interactions; density-functional theory; relativistic band structure; electronic localization and amorphous solids; two-dimensional phase transitions and superlattices. Prerequisite: PHYS 330 or consent of instructor. 354a: SPRING. [3–3] Pantelides.

PHYS 357a–357b. Atomic and Molecular Physics. Quantum mechanical treatment of atomic and molecular structure and dynamics, including binding, transitions, radiative transfer processes, and dynamics of elastic and inelastic scattering of electron-atom and atom-atom systems. Prerequisite: PHYS 330a–330b. SPRING. [3–3]

PHYS 359a. Surface Structure and Dynamics. Geometrical and electronic structure of surfaces, including surface reconstruction, density of states, and effects of adsorbates, impurities, and electronic defects. Prerequisite: PHYS 330a–330b. [3] Feldman.

Interdisciplinary Social and Political Thought

STUDENTS with an interest in expanding their knowledge of social and political thought beyond traditional disciplinary boundaries are invited to propose an individualized interdisciplinary master of arts degree in Social and Political Thought. The program is coordinated by Professor George J. Graham Jr. (Political Science). Students develop, in consultation with the coordinator, a set of courses, including Interdisciplinary Social and Political Thought 320a–320b, drawing on courses from any of the following graduate programs, to complete the 24 semester hours required for a master's degree: Comparative Literature, English, History, Philosophy, Political Science, Religion, and Sociology. The thesis topic must cross disciplinary boundaries.

320a–320b. Foundations of Social and Political Thought. Interdisciplinary study of a theme in social and political thought as reflected in the disciplines of communication studies, comparative literature, English, history, philosophy, political science, religion, and sociology. The first semester focuses on how the theme, currently "identity," is treated conceptually within these disciplines; the second, on how the study of the theme is treated within these disciplines. FALL, SPRING, SUMMER. [3–3] Graham and Staff.

Japanese

SENIOR LECTURER Keiko Nakajima
LECTURER Mine Yoshizawa

COURSES in Japanese are available for minor credit in master's degree programs only. Students should consult their advisers about the acceptability of the courses as related work.

201–202. Beginning Modern Japanese. Introduction to modern Japanese language including the acquisition of oral-aural skills, basic grammar, and introduction to reading and writing Japanese syllabaries and Chinese characters. [5–5] Nakajima, Yoshizawa.

211–212. Intermediate Modern Japanese. Emphasis on reading. Also included are syntax, writing, translation, and conversation. Prerequisite: 201–202. [5–5] Nakajima.

241–242. Third-Year Japanese. Readings in contemporary Japanese texts. Advanced conversation and discussion. Prerequisite: 211–212 or equivalent. [3–3] Nakajima.

251–252. Fourth-Year Japanese. Readings in advanced Japanese cultural, literary, and historical texts. Prerequisite: 241–242 or equivalent. [3–3] Yoshizawa.

289a–289b. Independent Study. 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. FALL, SPRING. [Variable credit: 1–3] Staff.

Jewish Studies

See Religion

Latin American and Iberian Studies

DIRECTOR Edward F. Fischer
ASSOCIATE DIRECTOR Frank Robinson

Affiliated Faculty

PROFESSORS Arthur A. Demarest (Anthropology), Tom D. Dillehay (Anthropology), Katherine Donato (Sociology), Marshall Eakin (History), Earl E. Fitz (Spanish and Portuguese), Leonard Folgarait (History of Art), James E. Foster (Economics), Edward H. Friedman (Spanish and Portuguese), Thomas A. Gregor (Anthropology), Cathy L. Jrade (Spanish and Portuguese), William Luis (Spanish and Portuguese), Andrea Maneschi (Economics), William L. Partridge (HOD and Anthropology), René Prieto (Spanish and Portuguese), Philip D. Rasico (Spanish and Portuguese), Mitchell A. Seligson (Political Science), David Wasserstein (History)

ASSOCIATE PROFESSORS M. Fráncille Bergquist (Spanish and Portuguese), Susan Berk-Seligson (Latin American Studies), Victoria Burrus (Spanish and Portuguese), Beth A. Conklin (Anthropology), Edward F. Fischer (Anthropology), William R. Fowler Jr. (Anthropology), Jonathan Hiskey (Political Science), John Janusek (Anthropology), Jane G. Landers (History), James J. Lang (Sociology), Benigno Trigo (Spanish and Portuguese), Andrés Zamora (Spanish and Portuguese)

ASSISTANT PROFESSORS Jason Borge (Spanish and Portuguese), Francisco Estrada-Belli (Anthropology), Maria José de la Fuente (Spanish and Portuguese), Annabeth Headrick (History of Art), Carlos Jáuregui (Spanish and Portuguese), Christina Karageorgou (Spanish and Portuguese), Emanuelle Oliveira (Spanish and Portuguese), Frank Robinson (History), Norbert O. Ross (Anthropology), Helena Simonett (Blair School of Music), Tiffiny A. Tung (Anthropology), Edward Wright-Rios (History)

SENIOR LECTURERS Frances Alpren (Spanish and Portuguese), Ana Regina Andrade (Economics), Tatiana Botero (Spanish and Portuguese), Cristina Capella (Spanish and Portuguese), Sarah Delassus (Spanish and Portuguese), Paul Miller (Spanish and Portuguese), Elena Olazagasti-Segovia (Spanish and Portuguese), Raquel Rincón (Spanish and Portuguese), Francisco Saez (Spanish and Portuguese), Lorraine Sciadini (Spanish and Portuguese), Waldir Sepúlveda (Spanish and Portuguese), Cynthia Wasick (Spanish and Portuguese)

DEGREE OFFERED:

LATIN AMERICAN STUDIES. *Master of Arts*

☙ THE Center for Latin American and Iberian Studies offers an interdisciplinary program of graduate instr uction in Latin American and Iberian studies in cooperation with the departments of Anthropology, Art and Art History, Economics, History, Political Science, Sociology, and Spanish and Portuguese. Affiliated faculty fr om other schools, including Education, Law, Management, Medicine, and Nursing also participate in the center .

Students work toward an M.A. in Latin American studies, a master's or doctoral degree in one of the related programs with a minor in Latin American studies, or a certificate in Latin American studies.

Candidates for the M.A. in Latin American studies choose a thesis (24 hours and thesis) or non-thesis (33 hours) option. Each option includes Latin American Studies 290. Candidates may spend part of their third or fourth semester doing research in Latin America, subject to approval by the center, the dean of the College of Arts and Science, and the Graduate School. Master's degree candidates are expected to demonstrate language ability in both Spanish and Portuguese; this means advanced ability in one of the two languages and intermediate ability in the other.

Students combining a master's degree from a related discipline with a minor in Latin American studies select area courses as their minor and must fulfill the center's language requirement of a reading and speaking knowledge of either Spanish or Portuguese. Doctoral candidates with a minor in Latin American studies must have a reading and speaking competence in either Spanish or Portuguese and a technical reading knowledge of the other. The doctoral minor consists of not less than 15 hours, selected from area courses in two disciplines.

A certificate in Latin American studies is awarded with either the M.A. or Ph.D. degree upon completion of at least 15 hours of course work across two or more disciplines and demonstration of language competence.

A joint master of arts and master of business administration degree program is available. Students apply both to Owen Graduate School of Management and the Center for Latin American and Iberian Studies. Successful applicants must be accepted both by the Owen School and the Graduate School. The first year of study is devoted to the M.B.A. program (30 hours), the second to course work in Latin American Studies (24 hours), and the final year is divided between M.B.A. studies and the writing of the master's thesis for the M.A. degree. Interested students should contact the Center for Latin American and Iberian Studies.

201. Introduction to Latin America. 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. SPRING. [3] Robinson (History).

234. Twentieth-Century Mexican Literature, Film, and Art. The historical, social, and political dynamic as expressed in various art forms. The relation between social reality and aesthetic form. [3] Folgarait (History of Art).

235. Gender, Ethnicity, and Language in the Americas. The interconnections between gender, ethnicity, and language, particularly in those regions of the Americas where Spanish is spoken. The ethnography of speaking, highlighting verbal art among indigenous peoples of Latin America and among U.S. Latinos. Phenomena resulting from bilingualism and language contact. Language rights (e.g., access to justice, right to use a language other than an official language in institutional settings). SPRING. [3] Berk-Seligson.

260. Latin America, Latinos, and the United States. 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] Eakin, Partridge.

290. Interdisciplinary Research Methods. Principal research methods and sources necessary for the study of Latin America in the social sciences and humanities. FALL. [3] Covington (History, Peabody), Robinson (History).

294a. Special Topics in Latin American Studies. Selected special topics suitable for interdisciplinary examination from the perspective of the social sciences and humanities, as announced in the *Schedule of Courses.* [3] (Not currently offered)

369. Master's Thesis Research. [0]

370. Fieldschool in Intercultural Education. Provides training in field research directed to human, social, and community development issues. Student research sponsored and supervised by an interdisciplinary team from Vanderbilt University and the Latin American faculty of social sciences (FLACSO). Fluency in Spanish required. SUMMER. [3] Staff.

390a–390b. Independent Study. A program of independent readings and research in a minimum of two disciplines, to be selected in consultation with the center's graduate adviser. FALL, SPRING. [3–3]

See departmental listings for courses offered 2006/2007. The following are specialized courses in the participating programs.

ANTHROPOLOGY: 210, Peoples and Cultures of Latin America; 212, Ancient Mesoamerican Civilizations; 213, Archaeology of the Ancient Maya Civilization; 220, Peoples and Cultures of Mexico; 226, Myth, Ritual, Belief: The Anthropology of Religion; 247, The Aztecs; 248, Ancient Empires and Civilizations of South America; 249, Indians of South America; 250, Shamanism and Spiritual Curing; 254, The Inca Empire; 256, Art of the Maya; 257, Mesoamerican Art; 275, Sociocultural Field Methods; 288a–288b, Independent Research.

ECONOMICS: 222, Latin American Economic Development; 288, Development Economics; 349a–349b, Reading Course; 353, Project Evaluation; 357, International Trade and Economic Development; 358a–358b, Policy Issues in Developing Economies.

HISTORY: 258, Rise of the Iberian Atlantic Empires, 1492–1700; 259, Decline of the Iberian Atlantic Empires, 1700–1820; 261, Colonial Mexico; 262, Modern Mexico; 263, Southern South America since 1800; 264, Brazilian Civilization; 266, Reform and Revolution in Latin America; 390a–390b, Independent Study.

HISTORY OF ART. 234, Twentieth-Century Mexican Literature, Film, and Art; 245, Art of Pre-Columbian America; 256, Art of the Maya; 257, Mesoamerican Art; 289, Independent Research; 294, Selected Topics.

MUSIC: 250, Latin American and Caribbean Music.

POLITICAL SCIENCE: 215, Change in Developing Countries; 217, Latin American Politics; 218, Social Reform and Revolution; 228, International Politics of Latin America; 229, Politics of Mexico; 315, Research in Latin American Politics; 316, Politics of Change in the Third World; 317, Political Development and Democratization; 323, Current Theory and Research in World Politics; 325, International Political Economy; 390a–390b, Independent Study.

PORTUGUESE: 200, Intermediate Portuguese; 205, Introduction to Luso-Brazilian Literature; 207, Spoken Portuguese; 223, Culture and Civilization of the Portuguese-Speaking World; 232, Brazilian Literature through the Nineteenth Century; 285, Modern Brazilian Literature; 289, Independent Study; 293, Contemporary Latin American Prose Fiction in English Translation; 294, Special Topics in Portuguese Language, Literature, or Civilization; 301, Literary Analysis and Theory; 302, Ibero-Romance Philology; 310, Foreign Language

Teaching: Theory and Practice; 385, Seminar: Studies in Contemporary Literature of the Portuguese-Speaking World (Portugal, Brazil, Lusophone Africa); 397, Special Studies in Portuguese Literature; 398, Special Studies in Brazilian Literature.

SOCIOLOGY: 265, Psychological Anthropology; 277, Contemporary Latin America; 279, Contemporary Mexican Society; 281, Development for a Small Planet; 390a–390b, Directed Studies.

SPANISH: 216, Phonology; 218, Morphology and Syntax; 221, Spanish Civilization; 223, Spanish American Civilization; 230, Development of Lyric Poetry; 231, The Origins of Spanish Literature; 232, Literature of the Spanish Golden Age; 233, Modern Spanish Literature; 234, Contemporary Spanish Literature; 235, Spanish American Literature; 236, Contemporary Literature of Spanish America; 237, Contemporary Lyric Poetry; 239, Development of the Novel; 240, The Contemporary Novel; 244, Afro-Hispanic Literature; 246, Don Quixote; 260, Development of the Short Story; 289, Independent Study; 293, Contemporary Latin American Prose Fiction in English Translation; 381, Seminar: Modern Spanish American Poetry; 386, Seminar: Contemporary Spanish American Short Story; 387, Contemporary Spanish American Novel; 398, Special Studies in Spanish American Literature.

In addition, qualified graduate students in the Latin American studies program may, with appropriate permission, enroll in Special Topics (294) courses directly relating to Latin America in particular years and in closely related general courses in years in which they are taught by members of the Latin American center faculty.

Leadership and Policy Studies

CHAIR James W. Guthrie
DIRECTOR OF GRADUATE STUDIES Mark Berends
PROFESSORS John M. Braxton, Robert L. Crowson Jr., Ellen B. Goldring, James W. Guthrie, James C. Hearn, Stephen P. Heyneman, Joseph Murphy
PROFESSOR OF THE PRACTICE Janet S. Eyler
ASSOCIATE PROFESSORS Robert Dale Ballou, Mark Berends, R. Wilburn Clouse, Constance Bumgarner Gee, Claire E. Smrekar
ASSISTANT PROFESSORS Mark D. Cannon, Laura M. Desimone, William Doyle, Michael K. McLendon, Thomas M. Smith

DEGREE OFFERED: *Doctor of Philosophy*

❧ THE Department of Leadership, Policy, and Organizations takes as its mission "to understand and enhance the social and institutional contexts in which learning occurs." To fulfill this mission, the department engages in multidisciplinary social and behavioral science research, professional development of leaders, and outreach projects. Particular attention is devoted to the study of leadership, organizational theory, the sociology of education, the social context of education, issues in evaluation, and the politics and economics of education. Students are exposed to a wide array of

inquiry tools, and both qualitative and quantitative research methodologies are highlighted. Interdisciplinary study is encouraged and fostered.

The department offers the doctor of philosophy degree in leadership and policy studies with specializations in educational leadership and policy, higher education leadership and policy, and international education policy and management. Each specialization has a set of required courses.

Specialization in Educational Leadership and Policy

The Ph.D. program in leadership and policy studies with a concentration in educational leadership and policy is designed for students who intend to build an academic career focused on the study of education and policy. As a Ph.D. student, enrollees will be matched with an LPO faculty member whose research interests align with their own. During their time in the department, students will apprentice with their faculty mentors to design individualized programs of study that reflect specific interests and backgrounds. As a student in the program, individuals will conduct research, present papers at scholarly conferences, and submit journal articles for publication. Upon completion, students will emerge with a program of research that will become a foundation for their professional and academic careers. The program will prepare participants for an academic career in a college or university, to enter the field of practice as a state or federal policy analyst, or to join a research group focused on the evaluation of education policy.

Transfer Hours: Up to 30 hours of transfer credit may be accepted in consultation with the student's adviser.

Total Minimum Hours: 72 hours

Specialization in Higher Education Leadership and Policy

The Ph.D. program in leadership and policy studies with a concentration in higher education leadership and policy is designed for individuals wishing to pursue an academic career in the study of higher education and higher education policy. For students who intend to build a career in teaching and research, the Ph.D. program will provide a chance to collaborate with a faculty member. Students will be involved in research projects that might include topics such as a comparative study of international higher education policies; delineation of a normative structure for undergraduate college teaching or for college student behavior; an analysis of state higher education policy initiatives; or developing and testing theories of student persistence. Students will also spend time studying in a cognate field (such as sociology, organizational theory, or economics) to bring those theoretical traditions to bear on the study of higher education. Enrollees are expected to develop a program of research, present papers at academic conferences, and submit journal articles for publication.

Transfer Hours: Up to 30 hours of transfer credit may be accepted in consultation with the student's adviser.

Total Minimum Hours: 72 hours

Specialization in International Education Policy and Management

The Ph.D. degree in leadership and policy studies with a specialization in international education policy and management is designed for students with diverse international career interests and ambitions. Some individuals will enter the world of international development assistance; others will be employed by foundations that have international education programs; and still others will enter the academic world of international education policy at universities in the U.S. or abroad. The program's core is composed of international education policy and management courses whose purpose is to provide students with a broad exposure to the education policy literature, and to provide an international context to which students may compare and contrast various education policies and their efficacy from the perspective of multiple countries and education systems.

Transfer Hours: Up to 30 hours of transfer credit may be accepted in consultation with the student's adviser.

Total Minimum Hours: 72 hours

LPO Core Courses (3400–3465)

3450. Leadership Theory and Behavior. Introduction to the nature of organizational leadership. Focus on the behavior of individuals and small groups in organizations with special attention to the role of formal and informal leaders. A major goal of the course is to enable students to reflect on themselves as leaders in conjunction with findings from research, theory, and experience. [3]

3452. Organizational Theory and Behavior. Explores both traditional and contemporary theories of organizations. Links organizational theory and behavior to leadership and requires an analysis of the major issues (i.e., change, gender, ethics, effectiveness) that modern complex organizations face. [3]

3460–3465. Special Topics. Explores special issues or topics related to education. May be repeated. [1–6]
3460. Special Topics in Education.
3461. Special Topics in School Administration.
3462. Special Topics in Higher Education Administration.
3463. Special Topics in Human Resource Development.
3464. Special Topics in Education Policy.
3465. Special Topics in Organizational Leadership.

Individual Study (3470-3499)

3470. Individual Study. Semi-independent study on selected topics in education. May be repeated. Consent of instructor required. [1–3]

Educational Leadership and Policy/School Administration Core Courses (3500–3599)

3500. Resource Allocation and Deployment. This course covers resource allocation issues for lower and higher education, public and private education, and United States and overseas education. "Resource," in this context principally, but not exclusively, refers to financial resource. The purpose of this course is to introduce participants to the means by which answers can be framed for questions such as: Who pays for education? Who goes

to school and who benefits from schooling? How much does education cost? How can resources be used to influence the trajectory of an organization? And how can resources for education be spent more efficiently? Additionally, the course is intended to enable participants to gain and enhance analytic and information gathering skills related to education finance and resource allocation. [3]

3510. U.S. Education Reform. This course is designed to: (1) increase students' familiarity with and understanding of select key issues in current school reform efforts; (2) enable students to systematically evaluate research on both sides of debates about particular types of school reforms, such as comprehensive school reform and standards-based reform; (3) increase students' ability to access and properly utilize research on school reform to inform analysis, evaluation, decision-making, and implementation; and (4) improve students' skills in oral and written analysis and presentation. [3]

3520. Instructional Leadership. Examines issues of school improvement and instructional leadership from the perspective of effective schools literature. [3]

3530. Economics of Education. This course focuses on problems of the American educational system. Most attention will be paid to primary and secondary education (grades K–12), although some issues in higher education will also be examined. The goal of the course is not merely to study what economists have said about the problems of American education, but to understand (and use) economic tools of analysis. These tools are of wide applicability and illuminate educational policies and practices (and much else) in all nations and societies. Although the focus is on the U.S., the course will be valuable to students whose principal interest is in international issues and educational systems abroad. [3]

3540. Governance and Politics in Education. This course deals with a central question in political science and public policy —How can public institutions be redesigned to improve accountability? This question is examined with particular attention to governance and politics in public school systems. Specifically , students will examine three sets of issues: (1) What is the role of politics in allocating resources in public schools? (2) What are key political challenges in the governance of urban school systems? (3) What is the politics of school choice? [3]

3550. Education Policy and School Law . Study of the general structure, theory, and background of the law as it applies to schools. Attention given to constitutional issues, negotiation problems, procedures, court decisions, and how to read a case. [3]

Educational Leadership and Policy /School Administration Elective Courses (3600–3699)

3600. Social Context of Education. Explores contemporary social, philosophical, and political dimensions of education and their relationship to leadership, including issues related to social class and culture, democracy and diversity, and equality and choice. [3]

3620. Doctoral Seminar in Education Policy. This course offers an "analytical foundation" for doctoral students who are interested in policy research. This seminar is open to doctoral students at various stages of their dissertation project—ranging from initial exploration of topics to the more advanced phase of drafting dissertation chapters. The course is designed to enhance various analytical skills of doctoral students including: (1) to develop a systematic understanding of the intellectual evolution of various key concepts in the field of educational policy, governance, politics, and organization; (2) to examine, in a critically constructive fashion, various theoretical approaches; (3) to learn about current debate on major issues in policy research; (4) to improve the organization of writing an academic research paper in educational policy. [3]

3630. Public Policy, the Arts and Art Education. This course is designed to: (1) acquaint students with the origins and evolving character of public funding for the arts in the United States; (2) introduce a wide range of current arts and arts education policy issues; and (3) provide a broad context within which rationales for and consequences of various forms of arts funding and programming can be explored and analyzed. We will delve into popular beliefs about the public and private purposes and significance of art in a democratic society. Different perspectives on the purposes, content, and delivery of K–12 arts education will be offered as participants consider the role of public education in the public's support (or non-support) of the arts. [3]

Higher Education Leadership and Policy/Higher Education Administration Core Courses (3700–3799)

3700. Organization and Governance of Higher Education. Explores various organization patterns of post-secondary educational institutions and state systems of higher education. Roles and responsibilities of governing boards, the president and other administrative offices, and involvement of faculty and students in college governance. [3]

3710. The Academic Profession: Structure and Roles. This course focuses on the structure of the American academic profession with particular attention concentrating on institutional and disciplinary differences among college and university faculty. The teaching and research role performance of college and university faculty as well as the various psychological, sociological, and organizational forces that shape the performance of these professional roles are also examined. Additional topics include the assessment of teaching and research activities of college and university faculty members. [3]

3720. The College Student: Structure, Processes and Effects. Study of the college student in contemporary society with focus on characteristics of students admitted and retained, impact of the college on the student, student values, and peer group influence. [3]

3730. State and Federal Government and Higher Education. This course is a seminar for advanced graduate students which focuses on the intersection of institutions, actors, and processes that result in the formation of public policy for higher education at both the state and federal levels of American government. It pursues this focus by examining the fluid political environment in which government operates, the fundamental conflicts governments act to mediate, the governmental process by which policies are formulated and the outcomes of policies that are enacted. The course emphasizes both the varied theoretical perspectives on the formation of higher education policy and the numerous contemporary policy challenges confronting campus and state officials. [3]

3740. Comparative Issues in Higher Education Policy Reform. Examines higher education from an international/comparative perspective. The intent of the course is to provide students the framework for examining and evaluating contemporary higher education issues comparatively. [3]

Higher Education Leadership and Policy/Higher Education Administration Elective Courses

3750. Social and Racial/Ethnic Diversity. This course covers a variety of issues regarding diversity in higher education. In drawing from the literature and research on faculty, administration, and students, the course provides an overview of critical issues currently facing institutions of higher education in our society. [3]

3800. The Nature and Function of American Higher Education. Historical study of the functions of American higher education and an examination of contemporary issues. [3]

3810. College and University Curriculum. Investigation into current curriculum trends and models. Review of recent practices and intensive attention to new and emerging curriculum models and relevant social and educational forces. [3]

3820. Service-Learning in Higher Education. This class engages students in the analysis and application of the theory of service-learning, i.e., the integration of community service and related academic study. Students will assist a service-learning program in higher education (or K–12, if appropriate) with planning, implementation, or evaluation, and integrate this experience with study of current theory and research. [3]

3830. Literature and Research in Higher Education. Introduction to the chief literature, major research tools and methods, and significant research and development centers of higher education in the United States. [3]

3840. The Role and Function of the American Community College. An overview provides a critical examination of issues in higher education in general and community colleges in particular. Explores the historic development, distinctive types, purpose, and roles of two-year colleges; the community-college student; the training and qualifications of two-year college faculty; and the structure and organization of two-year colleges. [3]

3851. Institutional Advancement Proseminar I. Focuses on alumni relations, government relations, public relations, publications and use of direct mail in colleges and universities, and the nature and function of philanthropy. Students will perform a number of class and group projects, and speakers will address the class. [3]

3852. Institutional Advancement Proseminar II. Comprehensive review of annual and capital campaigns, donor research, writing proposals, annual fund campaigns, and deferred giving for colleges and universities. Students will do class projects, and speakers will address the class. [3]

3853. Strategic Marketing and Planning in Higher Education. Comprehensive review of marketing and planning for higher education, consumer behavior, market research planning, target marketing, segmentation and strategic planning, and the relationship of marketing and planning to higher education. Course utilizes case studies. [3]

3860. College Student Personnel Services. Explores the history, philosophy, objectives, and organization of student personnel services with reference to orientation, residential and off-campus living, health services, guidance and counseling, student activities, foreign student advising, religious affairs, etc. [3]

3861. Theories of College Student Development. Students will explore various theories of college student development and will discuss their strengths and limitations. Through the course, participants will develop an understanding and the ability to apply these theories as practicing student affairs professionals. Course activities include discussion, classroom presentations, group activities, and lecture. [3]

3870. College and University Teaching. A study of the teaching-learning process while developing understanding of the relationship of the teacher, the student, and the particular discipline involved in the instructional process. [3]

3880. Law and Higher Education. Explores the constantly growing relationship between basic law and higher education. Seeks to acquaint the student with benchmark laws and court decisions and the resulting implications for higher education. [3]

3890. College and University Finance. Current issues in financing higher education, sources of revenue, methods of justifying requests for funds. Includes budgeting procedures, allocation systems, budget controls, and the relation of planning to budgeting. Course is for the generalist faculty member or general administrator, not for fiscal specialists. [3]

Methods Courses (3900–3929)

3900. Decision Analysis I: Logic of Systematic Inquiry. Focus on research methodologies, critical evaluation of reports, library research skills, and organizing an integrative review of existing theory and research. Class sessions and individual and group consultation. [3]

3902. Decision Analysis II: Qualitative Research. Introduction to the assumptions, the procedures of data collection, and the criteria for judging the quality of qualitative research. Students will take the first steps toward preparing a qualitative research proposal. [3]

3904. Decision Analysis III: Quantitative Research. An introduction to formal and informal inquiry processes for practitioners. Focus on problem identification and gathering, analysis, and interpretation of information relevant to the problem. Examines the framing of questions from multiple perspectives. Considers the illumination of practice through inquiry. [3]

3906. Decision Analysis IV: Education Policy and Program Evaluation. This course is designed to: (1) introduce students to concepts and methods of program evaluation; (2) enable students to design, analyze, and interpret program evaluations, based upon appropriateness and rigor of the study's theoretical framework, design methodology, and analysis; (3) build students' understanding of the politics of program and policy evaluation, and its role in mediating the impact of evaluation on policy; and (4) improve students' skills in oral and written analysis and presentation. [3]

3908. Decision Analysis V: Survey Methods. This is an introductory graduate course on quantitative survey research methods, with an emphasis on surveys in organizations. The objective is to provide students with the knowledge and tools necessary to design, conduct, and interpret organizational surveys (and the resulting data). [3]

3910. Modeling Context Effects in Educational Organizations. This seminar explores the methodological challenges and substantive implications of studying schools as complex organizations. Substantively, this course covers the literature on school effects, moving from early input-output studies to current research that examines the organizational context of schools, particularly the impact of within and between school stratification on student outcomes. Methodologically, this course provides an introduction to hierarchical linear modeling, including the conceptual background of hierarchical models, preparing data sets for use with HLM software, using the HLM software, strategies for analysis of data, applications of two- and three-level models, interpreting HLM output, and presenting results.

Individual Study Courses (3930–3990)

3930–3935. Research in Education. Individual programs of research in various education fields. Consent of faculty supervisor required. May be repeated. [1–6]
3930. Research in Education.
3931. Research in School Administration.
3932. Research in Higher Education Administration.
3933. Research in Human Resource Development.
3934. Research in Education Policy.
3935. Research in Organizational Leadership.

3940–3945. Field Experiences in Education. Individual or group opportunities for observation or other activities in a field setting by arrangement between a local school system or other educational agency, the student, and the supervising professor. Consent of faculty supervisor required. May be repeated. [1–6]
3940. Field Experiences in Education.
3941. Field Experiences in School Administration.

3942. Field Experiences in Higher Education Administration.
3943. Field Experiences in Human Resource Development.
3944. Field Experiences in Education Policy.
3945. Field Experiences in Organizational Leadership.

3950–3955. Practicum in Education. Individual or group practicum in a school or other social institution. Consent of faculty supervisor required. May be repeated. [1–6]
3950. Practicum in Education.
3951. Practicum in School Administration.
3952. Practicum in Higher Education Administration.
3953. Practicum in Human Resource Development.
3954. Practicum in Education Policy.
3955. Practicum in Organizational Leadership.

3960–3965. Internship in Education. Supervised on-site experience in a professional role. Interns serve as teachers, counselors, research associates, administrative aides, or other members of professional teams. Consent of major professor required. [1–12]
3960. Internship in Education.
3961. Internship in School Administration.
3962. Internship in Higher Education Administration.
3963. Internship in Human Resource Development.
3964. Internship in Education Policy.
3965. Internship in Organizational Leadership.

3970. Master's Thesis in Education. Open only to M.Ed. candidates engaged in thesis project. Consent of major professor required. [1–6]

3990. Doctoral Dissertation.

Liberal Arts and Science

DIRECTOR Martin Rapisarda

DEGREE OFFERED: *Master of Liberal Arts and Science*

❧ THE Master of Liberal Arts and Science degree program offers part-time, adult students the opportunity to earn an interdisciplinary, nontraditional graduate degree.

Each course meets one night per week and students select one course per semester. While the program is designed primarily for personal enrichment, students often discover important professional career benefits as well. The requirements and curriculum provide flexibility in program design and course selection, and the tuition, scheduling, admission, and registration procedures acknowledge the special circumstances of the part-time adult student.

Specific titles, topics, and instructors of courses are available for each semester from the director of the Master of Liberal Arts and Science degree program. Requirements for the degree are listed in the chapter on Academic

Regulations in the front of this catalog. Prospective students may also consult the Web site for additional information: *www.vanderbilt.edu/mlas*.

MLAS 260. Seminar in Humanities. [3]

MLAS 270. Seminar in Social Science. [3]

MLAS 280. Seminar in Natural Science. [3]

MLAS 290. Interdisciplinary Seminar. [3]

Selected Topics

MLAS 310. Selected Topics in Humanities. [3]

MLAS 320. Selected Topics in Social Science. [3]

MLAS 330. Selected Topics in Natural Science. [3]

MLAS 340. Interdisciplinary Selected Topics. [3]

MLAS 369. Master's Thesis Research. [0–3]

Management

DEAN Jim Bradford
DIRECTOR OF THE PH.D. PROGRAM Clifford A. Ball
PROFESSORS EMERITI J. Dewey Daane, David L. Rados, H. Martin Weingartner
PROFESSORS Clifford A. Ball, Bruce Barry, Joseph D. Blackburn Jr., Robert Blanning, Germain B. Böer, Paul K. Chaney, William G. Christie, Mark A. Cohen, Bruce Cooil, Richard L. Daft, William W. Damon, David Dilts, Raymond A. Friedman, Larry J. LeBlanc, Craig M. Lewis, Salvatore T. March, Ronald W. Masulis, Richard L. Oliver, Gary D. Scudder, Hans R. Stoll, Bart Victor, Robert Whaley
CLINICAL PROFESSORS James Bradford, William I. Henderson, Bruce Lynskey, David A. Owens, Frederick Talbott
ASSOCIATE PROFESSORS Nicolas Bollen, Jennifer Escalas, Luke M. Froeb, Karl Hackenbrack, Steven Hoeffler, Nancy Lea Hyer, Debra C. Jeter, Michael Lapré, David C. Parsley, Larry Van Horn, Richard Willis
ASSISTANT PROFESSORS Jacqueline Conard, Mara Faccio, Mumin Kurtulus, Neta Moye, Charu Raheja, Mikhael Shor, Timothy Vogus

DEGREE OFFERED: *Doctor of Philosophy*

THE doctor of philosophy degree in management is designed to prepare students for academic careers in teaching and research. The program is small and highly selective and fosters close student-faculty interaction in an atmosphere that is collegial and intellectually challenging. At the time of admission, students are accepted into one of the three specializations

currently offered in the Ph.D. program: finance, organization studies, and marketing.

To receive the Ph.D. in management, students complete 36–48 hours of formal course work, pass written and oral examinations, and demonstrate scholarship in a dissertation. The program is designed to allow students to satisfy their requirements for the Ph.D. within four years of study. Financial support that covers tuition and living expenses for four years is available for most students.

Students in the program select courses from among the offerings of the Owen Graduate School of Management as well as from other departments of the University. Courses within the Owen School are sometimes taken as enhanced versions of M.B.A. electives, with the instructor imposing additional or alternative requirements for doctoral credit. Owen School semesters are divided into two seven-week modules, with most courses lasting one module and carrying 2 hours of credit.

In the field of specialization, a student generally takes at least four courses plus at least two courses in an approved minor field. Specific requirements and course sequences vary by area. Beyond the specialization and its underlying disciplines, there is a breadth requirement that students pass one course in each of the other functional fields of management. (Students with relevant prior course work can seek a waiver of the breadth requirement in whole or in part.) Each student is also required to take two courses in economics and a minimum of four appropriate courses in statistics, research methodology, and/or mathematics. Students who have engaged in prior graduate study may be eligible for transfer credit for courses directly related to the student's field.

Each student in the program must pass a preliminary examination in the major field of specialization, which is generally taken by the end of the fifth semester. Students may also be required to pass a written preliminary examination in quantitative tools or a basic discipline, usually by the end of the third semester (this requirement varies by area). Students are encouraged to become active in the research process as early as possible, and are required to submit a research paper before the end of the third semester. Students typically complete the Ph.D. qualifying examination, involving the presentation of a dissertation proposal, by the end of the sixth semester of full-time study. The student is expected to complete and defend the dissertation by the end of the eighth semester.

Applicants to the Ph.D. program must submit scores from the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT), transcripts for all prior work at the college or university level, and letters of recommendation from individuals who can speak to the applicant's ability to undertake doctoral-level study in an academic program focused on scholarly research. Admissions decisions are made based on the applicant's academic qualifications as well as on an assessment of the fit between a candidate's scholarly interests and those of the school's current research faculty.

Accounting

311. Introduction to Accounting. A study of the basic concepts and limitations of financial and managerial accounting. Covers the financial reporting process and the development of financial statements for external users, such as investors and creditors, and also the preparation and utilization of financial information for internal management decision making. No credit for Ph.D students in Management. [4] Chaney, Hackenbrack.

411. Financial Accounting. Objectives are to gain a knowledge of the functions, limitations, and challenges of financial accounting and to develop the capability to evaluate critically and understand financial accounting theory and practice. Includes the study of financial accounting theory, the formulation of accounting principles, and the structure of generally accepted accounting principles. Prerequisite: 311. [4] Jeter.

511. Accounting for Mergers and Acquisitions. A study of advanced topics in financial accounting. Emphasis is on accounting for business combinations, including purchase and pooling of interests, consolidated financial statements, cash flows, translation of foreign financial statements, and other selected issues. Prerequisite: 411. [2] Jeter.

513. Financial Statement Analysis. This course focuses on corporate financial statements and provides an appreciation for the issues faced by corporate managers as they design a financial reporting strategy. Skills developed in the course include analysis of business performance through financial statements; analysis of earnings quality and other accounting matters; valuation of firms; and forecasting earnings and cash flows. The course also offers perspectives on the role of financial reporting and financial statement analysis in the capital markets, and an appreciation of the importance to business managers of their own financial reporting and disclosure policies. Prerequisite: 411. [2] Cleary.

519. Special Topics in Accounting. Prerequisite: consent of instructor.

539f. Special Topics in Finance: Federal Income Taxation of Mergers and Acquisitions. This course is designed primarily for the student who wants a general understanding of the basic principles and concepts of federal income taxation that apply to corporate mergers, acquisitions, and LBOs. Topics include taxable and tax-free stock and asset acquisitions; incorporation transactions; non-acquisitive reorganizations; current and liquidating distributions to shareholders; stock redemptions; and survival of net operating losses and other tax attributes. The objectives of the course are not to make students "tax experts," but to sensitize them to the tax implications of mergers and acquisitions so that, as business managers, entrepreneurs, or advisers, they can spot the tax concerns or opportunities, identify the major tax issues, ask good questions of the "tax experts," and understand the answers received as a critical step in making business and financial decisions that maximize wealth. Prerequisite: 331. [2] Henderson.

612. Research Seminar in Accounting. Prerequisite: consent of instructor.

615. Independent Study in Accounting. Prerequisite: consent of instructor.

Economics

321. Business in the World Economy. Addresses the impact of national and global economic developments on the business environment. The determinants of national income, inflation, interest rates, unemployment rates, business cycles, exchange rates, and foreign investment are discussed, with particular attention to the increasingly important linkages between the U.S. and global economies. The course also examines the effects of U.S. and foreign government policies with respect to taxation, public expenditures, money supply,

capital markets, and foreign trade and investment on the economic environment of business. Prerequisite: 322. [2] Parsley.

322. Managerial Economics. Studies the behavior of consumers and firms in a market economy. Topics include bilateral bargaining, auctions, supply and demand, costs, competition, monopoly, oligopoly, the organization of firms and markets, and strategy. [2] Froeb.

425. Game Theory and Business Strategy. Game theory is a discipline that offers a systematic way of analyzing problems of strategic behavior in interactive situations. This course develops basic concepts from game theory and applies them to business strategy. Some of the concepts to be considered include: 1) decision tree analysis; 2) looking forward and reasoning backward; 3) anticipating the moves of the rival; 4) inducing cooperation; 5) strategic use of commitments, threats, promises, and credibility; 6) pre-emptive moves and deterrence; and 7) creating and using one's reputation strategically. The strategic significance of these concepts will be demonstrated through business case studies. Prerequisite: 321. [2] Shor.

427. Economics of Organizations. Until recently, economics largely ignored the internal organization and operation of the firm. However, new developments in agency theory and game theory have made it possible to analyze the roles of information and incentives inside the firm. The course seeks to provide students with the knowledge and powerful thinking tools that will help them to understand the internal organization. Prerequisite: 322. [2] Cohen.

Finance

331. Managerial Finance. An analysis of the basic problems in corporate financial management. The course is organized around the theme of asset valuation. Topics covered include stock and bond valuation, capital budgeting, cost of capital, market efficiency, and company valuation. No credit for Ph.D students in management. [2] Raheja.

432a. Corporate Value Management. Focuses on corporate valuation. Topics covered include the use of financial statements in developing cash flow forecasts, estimating the cost of capital, financing policy, tax effects, investment options, and managing companies to add value. Applications include: capital budgeting, mergers and acquisitions, corporate restructuring. Prerequisite: 331. [2] Lewis.

432b. Corporate Financial Policy. Examines major financial decisions and policies of a corporation. The topics considered are dividend policy, security issuance and repurchase decisions, management compensation plans, optimal capital structure, uses of various financial instruments, bankruptcy and reorganization, going public and going private. Prerequisite: 432a. [2] Faccio.

433a. International Financial Markets and Instruments. Assesses the international economic environment in which business and individuals operate. Financial markets examined are the foreign exchange markets, offshore financial markets, derivative markets, and international capital markets. Prerequisite: 431. [2] Stoll.

433b. International Corporate Finance. Unique problems of the financial manager operating internationally are considered. Topics covered include management of foreign exchange risk, multinational capital budgeting, foreign direct investment, risk management, and international taxation. Prerequisite: 433a. [2] Staff.

435a. Equities Markets. This course deals primarily with the functioning of U.S. equity markets. Topics studied include trading costs, bid-ask spreads, regulatory issues, market efficiency, and trading anomalies. Prerequisite: 431. [2] Bollen, Christie.

435b. Fixed Income Markets. Analysis of government, municipal, and corporate debt markets. Term structure of interest rates. Interest rate risk. Duration and convexity. Mortgage backed securities. Prerequisite: 431. [2] Staff.

435c. Derivatives Markets. Analysis of futures, swaps, and options markets. Topics include relation of futures and cash prices, hedging with futures, risk and return in futures, option trading strategies, put-call parity, and option valuation. Derivatives on commodities, on stock indexes, and on debt instruments will be analyzed. Prerequisite: 431. [2] Stoll.

436. Financial Institutions. Focuses on the managerial issues in banking and other financial services firms. Examines the specialized contracts used in the financial services industry and the interplay between information, technology, taxation, and regulation in shaping the structure and markets for these contracts. Prerequisite: 431. [2] Staff.

530. Mergers and Acquisitions. Covers some of the major corporate finance activities of investment banks including: mergers and acquisitions, takeovers and takeover defenses, as well as private financing, asset restructuring, capital restructuring, leveraged buyouts, management buyouts, and leveraged recapitalizations. Familiarizes students with institutional details and presents a variety of case situations in which corporate valuation, industry and financial analysis, strategic decision making, and financial contracting and design are practiced. Casework represents an integral part of this course and is used to challenge students to structure their own analysis of how corporate finance can be used to create value for shareholders. Prerequisite: 432a. [2] Masulis.

531. Venture Capital and Financial Engineering. This course presents an overview of the major players in investment banking and venture capital and their respective roles and functions, and examines a variety of capital-raising activities including venture capital, initial public offerings, and private financing. The course also explores basic financial engineering concepts relating to investment banking and financial strategy. Regarding venture capital, the course explores how to structure startups, how to obtain financing, how to value private companies, and how venture capital firms create value through careful incentive contracting, thorough monitoring, and timely advice and counsel. This course is meant to familiarize students with institutional details and to present a variety of case situations where valuation tools, strategic decision making, and a fundamental understanding of financial incentives are practiced. Casework represents an integral part of this course and is used to challenge students to develop their own analysis. Prerequisite: 432a. [2] Staff.

532. Risk Management. Considers techniques for risk management of financial institutions. Topics include value at risk systems for managing risk, the application of portfolio theory to risk management, forecasting risk and correlations, regulatory approaches to risk control, and regulatory capital requirements. Prerequisite: 435b, c. [2] Ball.

535a. Derivative Securities Valuation. Examines the pricing of derivative securities. Focuses on futures, options, and exotic securities. A number of valuation techniques are examined which include numerical approaches. Prerequisite: 435c. [2] Schlag.

539a. Special Topics in Finance: Financial Data Analysis. Introduces students to the many databases used in empirical research in finance, including CRSP, Compustat, and TAQ (NYSE, Amex, and Nasdaq-NMS transaction data). The course will use the SAS System to access these databases and to analyze the data. Basic Fortran programming will also be presented to familiarize students with CRSP/Compustat access programs. Intended for Ph.D. students and M.B.A.'s who are interested in more analytically oriented finance positions. Prerequisite: 431. [2] Schenzler.

539d. Special Topics in Finance: Quantitative Portfolio Management. Takes the perspective of a quantitatively oriented equities portfolio manager. Examines portfolio theory, portfolio selection models, equilibrium asset pricing models such as the CAPM and the

APT, earnings estimation, and the evaluation of portfolio performance. Designed for very quantitatively oriented students. Prerequisite: 431. [2] R. Cooper.

630a. Asset Pricing Theory. Rigorously develops the theoretical basis for major asset pricing models. Single period versions of the Capital Asset Pricing Model, the Arbitrage Pricing Model, and the Option Pricing Model are formally developed from basic economic principles. Prerequisite: consent of instructor. [2] Staff.

630b. Corporate Finance Theory. Uses state preference theory to develop single period theories of optimal investment and optimal capital structure. Explores models of adverse selection and moral hazard and uses them to evaluate management compensation, financing decisions, and corporate ownership structure. Recent empirical evidence is reviewed and the techniques and evidence are critiqued. Prerequisite: consent of instructor. [2] Staff.

631a. Empirical Methods in Finance A. The first of two courses that examine the recent empirical developments in financial economics. Focuses on topics in financial markets such as market efficiency, market models, arbitrage pricing models, intertemporal equilibrium models, and market microstructure. Theoretical foundations are developed; empirical research evidence is considered; applications of models are stressed. Prerequisite: 630a, b. [2] Staff.

631b. Empirical Methods in Finance B. The second of two courses that examine the recent empirical developments in financial economics. Focuses on topics in corporate finance such as the securities issuance process, capital structure, corporate governance, and market response to corporate disclosures. Prerequisite: 630a, b; 631a. [2] Staff.

632. Advanced Finance Theory. Covers an advanced treatment of finance theory. Topics include utility theory, arbitrage and pricing, equilibrium models and complete markets, intertemporal models, continuous time finance, contingent claim pricing, and the term structure of interest rates. Prerequisite: 630a, b. [2] Staff.

635. Independent Study in Finance. Prerequisite: consent of instructor.

636. Research Seminar in Finance. Prerequisite: consent of instructor.

Information Technology

490. Enterprise Resource Planning. Enterprise Resource Planning (ERP) is the integration of information sources and flows across the various components of an enterprise. The purpose of ERP is to facilitate the seamless coordination of the organization's key activities, especially logistical and financial activities. Several organizations (J. D. Edwards, SAP) offer software designed specifically for ERP. The course will examine the components of ERP systems, how the integration is accomplished, and the functions of ERP software. This course uses a new approach to team training that combines an interactive, dynamic case study and a management information system. This tool (Operations Trainer) combines a model base and a database designed to support a new methodology for training managers and to provide an environment for practicing teamwork in managing a dynamic integrated process. [2] Blanning.

496a. Information Technology and Internet Commerce. Introduces the basic computer hardware, software, and communication technologies that enable the development of these capabilities. Applications include traditional Electronic Data Interchange (EDI) and emerging Net-Centric Systems foundational to Electronic Commerce (EC). Students will use these technologies to design and implement Web systems capable of interacting with internal marketing, production, and accounting information systems, and external electronic payment systems. Such Web systems enable customers to examine products and pricing options, place orders, track their progress, make payments, and check their account status directly over the Internet. [2] March.

497. Internet Technology and Applications. Describes the structure and function of the Internet and the information superhighway concept. Topics include the TCP/IP Protocol Suite, Internet information services (e-mail, file transfer, telnet), information resource discovery (the World Wide Web and search engines), "intranetworking" within a corporation, network security and firewalls, the information superhighway concept, and national information infrastructure. Students will learn to script Web pages using HTML and to program in JavaScript. [2] Blanning.

591. Managing Information Technology Projects. Focuses on how to manage information technology projects. Explores the management of IT projects from a theoretical and practical perspective. Uses cases and models as students get hands-on experience with project management software. Introduces the student to the PMI (Project Management Institute) body of knowledge and certification exam. [2] Staff.

Marketing

361. Marketing Management. Introduction to the substantive and procedural aspects of marketing management. Structured around the "3 Cs" of strategic marketing analysis (customer, company, and competitor) and the "4 Ps" of the marketing mix (product, promotion, price, and distribution [place]). The main goals are to (a) develop students' abilities to recognize opportunities and solve problems related to marketing strategy, (b) improve students' decision-making skills as applied to the planning of marketing programs, (c) present a variety of examples of how firms manage their marketing efforts, and (d) provide students with opportunities to present and defend their own marketing analyses and recommendations. Prerequisite: 322. No credit for Ph.D. students in management. [2] Conard.

461a. Marketing Research. Covers the fundamental marketing research skills of problem formulation, secondary data analysis, qualitative research, research design, questionnaire design, data collection, survey sampling, and basic data analysis. This course is oriented to the marketing manager who needs to understand the fundamental decision issues in designing marketing research and interacting with marketing research suppliers. Method of instruction is primarily lecture with some computerized statistical demonstration. Prerequisite: 361, 381. [2] Escalas.

461b. Marketing Engineering Project. Centered around qualitative research and field research surveys conducted by 4–5 person student teams. Method of survey administration can be in-store intercept, mail, phone, or electronic. The instructor will provide a variety of sponsored projects, although student teams have the option of finding their own project sponsor. Method of instruction will be lectures focusing on project management and intermediate data analysis methods (cross tabulation, analysis of variance, and multiple regression), group work, and in-class presentations. Prerequisite: 461a. [2] Staff.

463a. Advanced Marketing Management I. Intended as a capstone for those concentrating in marketing, this course deals with issues of importance to senior marketing managers and to general managers. Deals broadly with the formation and implementation of marketing strategy, including opportunity analysis, segmentation, positioning, and marketing strategies for different market situations. Also deals with organizational issues such as the product management system and national account management, as ways of carrying out the marketing strategy. Prerequisite: 361. [2] Staff.

463b. Advanced Marketing Management II. Continues Advanced Marketing Management I, with a focus on such topics as strategic role of channels of distribution, the development of new markets, and growth strategies. Prerequisite: 463a recommended. [2] Staff.

466. Pricing and Channel Management. Covers topics in pricing, purchasing, and distribution. Purchasing is covered because effective pricing must understand purchasing. Distribution issues are also covered because pricing and distribution are two interrelated components of the marketing mix. Marketing and microeconomic pricing tools are introduced and utilized in a number of cases involving both industrial and consumer goods pricing. Among the topics covered are pricing of new products and services, changing the price of existing products, price and quality, product line pricing, negotiating prices with large customers, bundling, price promotions, and yield management. Through readings, lectures, and cases, the course provides an overview of purchasing, including supplier relations as well as distribution issues, emphasizing the relationship between pricing and distribution. Prerequisite: 361. [2] Shor.

467. New Product and Service Development. Emphasizes the proactive product and service development process. Specific topics include evaluation of potential markets; identification, design, and development of new products and services consistent with customer needs; concept testing; pretest marketing; and test marketing. The course emphasizes both the qualitative and analytical tools that can aid the marketing manager in reducing the probability of new product failure and enhancing ultimate profitability. Prerequisite: 361. [2] Staff.

468. Product Management. Students will examine the key underlying drivers of successful product management: marketing strategy, growth marketing, differential advantage, customer and market analysis, the product management system, and marketing planning. Teams of participants design and implement marketing strategies and plans within the competitive environment of the simulation. The marketing simulation game provides the feedback to allow participants to learn from the marketplace and refine their product management skills. Prerequisite: 361. [2] Staff.

499. Consumer Behavior in Online Environments. The objective of this course is to understand human-computer interaction on the Web and in other computer-mediated environments. In what ways are online environments similar to and different from traditional media environments, and what are the implications of these similarities and differences for marketers? The course begins with a consideration of general online demographics, usage, and trends, and a discussion of the range and scope of online environments. We then consider topics in human-computer interaction, at both the individual (i.e., search, decision-making, and navigation) and the social (i.e., virtual communities, communication, and public policy) level. Throughout, the course is concerned with the application of consumer behavior principles to product design and marketing in online environments. Prerequisite: 361. [2] Staff.

560. Marketing Strategy. Builds on the strategic groundwork laid in core marketing and offers students an opportunity to apply their marketing strategy skills. Students will compete in an elaborate, multi-period marketing simulation (Markstrat). As in the real market, there will be winners and losers, and students' grades will be based partially on how well they perform against competitors in this simulation. In addition, the course will introduce research on special topics such as first-mover advantage and competitive conjectures. Prerequisite: 361. [2] R. L. Oliver.

562a. Service Marketing. Focuses on managing service, which is now over 80 percent of the economy and drives the information economy and Internet. Focuses on identifying customer groups and devising methods of listening to them. Students investigate the links between customer satisfaction.and internal business processes, learn methods of making service improvements financially accountable, and learn a strategic framework that brings together customer value management, brand equity, and relationship management. Prerequisite: 361. [2] Staff.

Operations

371. Operations Management. Overview of operations management in both service and manufacturing organizations with an emphasis on international operations. Topics include operations strategy, process analysis, quality control, queuing, enterprise planning systems, lean manufacturing, and supply chain management. Prerequisite: 382. No credit for Ph.D. students in management. [2] Lapré.

470. Design for Manufacturing. Organized around a framework that will help managers effectively lead the design process from the identification of customer needs to production. Students will be presented with methods to translate customer needs into product specifications to dovetail marketing and manufacturing. Also, since the majority of a product's unit cost is determined during design, the course teaches managers to identify the sources of these costs and control them through intelligent product development. Prerequisite: 371. [2] Owens.

471. Operations Planning and Control. Provides familiarity with state-of-the-art, computer-based production planning techniques. Topics include demand forecasting, aggregate planning and scheduling, material requirements planning, theory of constraints concepts, just-in-time systems and scheduling. Prerequisite: 371. [2] Blackburn.

472. Supply Chain Management and Information. Introductory course on managing material and information flows throughout the supply chain, including aspects of product design and configuration, inventory planning, network configuration, and channel management. A substantial portion of the course will be devoted to electronic commerce applications and software to enable supply-chain processes. Prerequisite: 371. [2] Dilts.

473. Simulation. Introduces the power of computer simulation as a managerial support tool. Students develop simulation models with computer graphic animation using advanced simulation software. Emphasis on application of simulation to manufacturing and service operations problems such as capacity planning, buffering and work-in-process, inventory system design (supply chain), and scheduling. Prerequisite: 371. [2] LeBlanc.

475. Operations Strategy. Topics include the importance of manufacturing strategy to overall business strategy, as well as its relationship to other functional strategies in the firm. Additional topics include management of process technology, location and capacity management, and manufacturing performance measurement and how these issues affect competitive advantage. Lectures, outside readings, guest speakers and cases are used to illustrate these concepts. Prerequisite: 371, 355. [2] Scudder.

476. International Operations. Examines the importance of global manufacturing and service operations. How economics, currency fluctuations, politics, cultural traditions, and the infrastructures of the countries involved affect strategic and operational decisions such as facilities location and planning, materials sourcing, inventory control, process design, workforce management, and quality control. Compares operational hedging with financial hedging. Examines Mexican Maquiladora, Japanese, and European operations. Prerequisite: 371. [2] LeBlanc.

477. Supply Chain Analysis. Managing material and information flows throughout the supply chain. Unlike MGT 472, this course focuses on more in-depth (and usually quantitative) analysis of supply chain problems. Topics include forecasting in a supply chain context, inventory modeling in single- and multi-location systems, the use of supply chain initiatives such as vendor-managed inventory and quick response, incentives and supply contracts, and distribution strategies. Students interested in transportation and facility location aspects of supply chain should take 478. Prerequisite: 371. Recommended: 472. [2] Staff.

479. Management of Service Operations. Considers process design and management in a service industry context—pure service industries (hospitals, financial services, airlines,

hotels, etc.) as well as service departments (call centers) in non-service industries. Topics include managerial levers for service delivery system design, use of simulation for process design, front-office and back-office process design, management of service capacity, and management of service demand (yield management). Prerequisite: 371. [2] Lapré.

572. Strategic Management of Technology. This course focuses on the strategic management of technology and innovation in established firms. The conceptual framework of the course is an evolutionary process perspective on technology strategy and innovation. The fundamental ideas underlying this evolutionary perspective are 1) that a firm's technology strategy emerges from its technological competencies and capabilities, 2) that technology strategy is shaped by external (environmental) and internal (organizational) forces, and 3) that the enactment of technology strategy, through the experience it generates, serves to further develop the firm's technological competencies and capabilities. Cases, readings and lectures are utilized. Prerequisite: 371. [2] Scudder.

576. Time-Based Competition. Response time has emerged as a critical dimension of global competition. The leading manufacturing and service firms have lean, flexible production processes that provide world-class quality and quick response while remaining cost competitive. This course examines from an operations perspective how a firm develops processes that deliver fast response to customer demands. Just-in-time and business process reengineering are examined in detail. Prerequisite: 371. [2] Blackburn.

577. Managing Processes for Improvement. Focuses on technical and teaming skills necessary to be an advocate for quality in an organization. Topics include: understanding quality, the improvement cycle, basic quality tools, ISO9000, the Malcolm Baldrige Quality Award, eliminating complexity from work, and implementing quality in organizations. Several weeks are devoted to the study of statistical process control. Prerequisite: 371. [2] Hyer.

Organization Studies

440. Strategic Alignment of Human Capital. Designed to help business leaders understand the key challenges to managing human capital in organizations. Focus will be on building skills for diagnosing the fit between business strategy/objectives and human resource practices, as well as on those skills required to develop creative solutions to improve this fit. [2] Moye.

441. Organization Design. Considers traditional and innovative designs for organizational structures and processes within business organizations. Topics include environment and structure, corporate culture, power and politics, decision making, and new organizational designs. [2] Owens.

442. Work Team Management. Focuses on methods of understanding and improving the performance of work teams. A holistic view of teams is obtained through combining psychological theories and current practices in contemporary business organizations. Topics include task design, team composition, member role structures, member socialization, influence and power, leadership, decision making, and training. A heavy emphasis is placed on experiential learning, including numerous case studies and a variety of team-building exercises. Prerequisite: 342. [2] Owens.

443. Power and Influence in Organizations. Explores issues of power, powerlessness, influence, conflict, and dissent within and between various types of organizations. Through readings, case studies, and discussions, we examine how power is gained, maintained, used, abused, and lost in the pursuit of interpersonal and organizational objectives. Also examines social issues at the intersection of business and society that may be analyzed in

terms of power and influence, such as workplace rights, wealth distribution, and sexual and racial politics. [2] Barry.

445. Human Resource Staffing. Examines organization staffing strategies. Topics include human resource planning, recruitment, job analysis, applicant assessment, equal employment opportunity, and affirmative action. Particular emphasis is given to the role of statistical analysis in designing and evaluating staffing systems. Practical exercises focus on strategically designing and evaluating staffing procedures. [2] Moye.

446. Compensation Management. Analysis of approaches to the motivation of human performance through reward systems, particularly compensation systems. Theoretical models from economics, psychology, and sociology are integrated in analyses of issues of wage structuring, the design of incentives, and wage level. Practical exercises in the design of compensation systems are employed. [2] Moye.

448. Negotiation. Designed to provide students from all functional backgrounds with skills needed to approach negotiations with confidence. This includes a framework for analysis, knowledge about one's own tendencies in negotiation, and a chance to experiment with negotiating techniques in various contexts. Topics include: integrative and distributive negotiations, individual differences in bargaining styles, coalitions, team negotiations, negotiating through agents, and ethical issues in negotiation. The course uses readings and cases, with considerable emphasis placed on negotiation simulations. [2] Barry, Friedman.

449. Product Design and Innovation. Focuses on understanding and managing creativity and innovation in organizations using the frameworks and insights of organizational behavior. While this course draws heavily on the contexts of new product development (NPD), the management of research and development (R&D), and knowledge management for its examples, the insights generated will apply to any context, discipline, or organization facing the problem of routinely innovating. The course does not require familiarity with R&D or NPD processes, but it does assume an interest in the organizational and human-resource aspects of motivational processes. [2] Owens.

456. Ethics in Business. Designed to familiarize students with ethical dilemmas and opportunities for moral leadership in business. Students will develop a deeper understanding of the kind of ethical dilemmas they may face in business. They will also develop their skills and confidence in taking moral leadership in their professional careers. Case studies, invited speakers, and readings are used to deepen understanding of the issues and provide practical examples. [2] Victor.

642. Research Seminar in Organization Studies. Prerequisite: consent of instructor.

645. Independent Study in Organization Studies. Prerequisite: consent of instructor.

Statistics

381. Managerial Statistics. Principles of statistical analysis and inference, including descriptive statistics, probability theory, statistical estimation, tests of hypotheses, analysis of variance, and regression and correlation analysis. [2] Cooil.

480. Business Forecasting. Topics include smoothing methods, multiple regression, and ARIMA models. Prerequisite: 381. [2] Cooil.

482. Managerial Statistics II. The emphasis is on important general forms of data analysis, basic exploratory methods, and multiple regression. Prerequisite: 381. Ball.

581. Stochastic Processes. Emphasizes the role of stochastic modeling in finance and economics. Topics include random walks, Brownian motion, Wiener processes, Poisson processes, Markov chains, diffusion processes, martingales, and Ito stochastic calculus. Applications to security pricing. Prerequisite: consent of instructor. [2] Ball.

682. Research Seminar in Quantitative Analysis. Prerequisite: consent of instructor.

685. Independent Study in Quantitative Analysis. Prerequisite: consent of instructor.

Materials Science and Engineering

See Interdisciplinary Materials Science

Mathematics

CHAIR Dietmar Bisch
VICE CHAIR Philip S. Crooke III
DIRECTOR OF UNDERGRADUATE STUDIES Mark N. Ellingham
DIRECTOR OF GRADUATE STUDIES Douglas P. Hardin
DIRECTOR OF TEACHING Jo Ann W. Staples
PROFESSORS EMERITI Richard F. Arenstorf, Billy F. Bryant, Richard R. Goldberg, Robert L. Hemminger, Ettore F. Infante, Bjarni Jónsson, Charles S. Kahane, Richard J. Larsen, Charles K. Megibben, James R. Wesson, Horace E. Williams
PROFESSORS John F. Ahner, Akram Aldroubi, Dietmar Bisch, Alain Connes, Philip S. Crooke III, Emmanuele DiBenedetto, Paul H. Edelman, Mark N. Ellingham, Yanqin Fan, Matthew Gould, Douglas P. Hardin, C. Bruce Hughes, Gennadi Kasparov, Ralph N. McKenzie, Michael L. Mihalik, Alexander Ol'Shanskiy, Michael D. Plummer, John G. Ratcliffe, Edward B. Saff, Mark V. Sapir, Larry L. Schumaker, Constantine Tsinakis, Glenn F. Webb, Daoxing Xia, Guoliang Yu
VISITING PROFESSORS Jaroslav Jezek, Rico Zacher
ASSOCIATE PROFESSORS Mary Ann Horn, Marian Neamtu, Eric Schechter, Gieri Simonett, Steven T. Tschantz, Dechao Zheng
ASSISTANT PROFESSORS Simon Foucart, S. Kumar Ghosh, Pinhas Grossman, Dan Guralnik, Qayum Khan, Daphne Manoussaki, George Metcalfe, Remus Nicoara, Mikhail Perepelitsa, Alexander Powell, Romain Tessera, Christoph Walker, Brett D. Wick, Ju-Yi Yen, Gexin Yu
RESEARCH ASSISTANT PROFESSORS Johan Brauchart, Maria K. Byrne
VISITING SCHOLARS Anamaria Gomide, Qin Wang
SENIOR LECTURERS Derek Bruff, Linda Hutchison, Pamela Pigg, John Rafter, Lori Rafter, Jo Ann W. Staples

DEGREES OFFERED: *Master of Arts, Master of Arts in Teaching, Master of Science, Doctor of Philosophy*

☞ A MASTER'S degree may be earned by (a) completing 24 hours of course work and a thesis or by (b) completing 36 hours of course work. It may also be awarded (c) on admission to candidacy for the Ph.D. degree. Program (b)

is strongly recommended for students who plan to terminate their graduate work with a master's degree; with the department's approval, however, a student may pursue a terminal master's degree under program (a).

By careful selection of courses, a master's candidate may achieve special preparation in applied mathematics or computer science and thus become qualified for a position in industry or government or as a teacher in high school or junior college. Each of the master's programs is adequate preparation for advanced graduate work in mathematics.

Candidates for the Ph.D. degree take at least 48 hours of formal course work, including seven courses from 272a–272b, 283a–283b, 330a–330b, and 331a–331b, and at least eight additional courses at the 300 level. All Ph.D. candidates are required to demonstrate a reading knowledge in one of the following languages: French, German, Russian. A complete description of Ph.D. requirements in mathematics may be obtained on request from the director of graduate studies.

Courses acceptable for credit toward an advanced degree in mathematics are those listed below that are numbered 247, 248, or 270 or above, unless exception has been granted. Courses numbered below 270 may be used for minor credit by students in other disciplines. All graduate students participate in teaching activities. This requirement may be waived in the case of students with previous teaching experience.

200. Intensive Problem Solving and Exposition. Intended to develop widely applicable mathematical skills. Focus on use of basic principles such as induction, the pigeonhole principle, symmetry, parity, and generating functions. Prerequisite: one year of calculus and consent of instructor. FALL. [3] Nicoara.

204. Linear Algebra. Algebra of matrices, real and complex vector spaces, linear transformations, systems of linear equations. Eigenvalues, eigenvectors, Cayley-Hamilton theorem, inner product spaces, orthogonal bases. Hermitrian matrices. Designed primarily for mathematics majors. No credit for students who have completed 194 or 205a. Corequisite: 170b or 175. Credit will not be given for both 204 and 294 or 205a–205b. FALL, SPRING. [3] Staff.

208. Ordinary Differential Equations. First- and second-order differential equations, applications, linear differential equations, series solutions, boundary-value problems, existence and uniqueness theorems. This course is intended for mathematics and advanced science majors. Prerequisite: linear algebra, and 221b or 222 or equivalent. Credit is not given for both 229 and 247. FALL, SPRING. [3] Staff.

215. Discrete Mathematics. 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: linear algebra. FALL. [3] Staff.

216. Probability and Statistics for Engineering. 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. Credit is not given for both 216 and 218. SPRING. [3] Staff.

218. Introduction to Mathematical Statistics. A survey of probability and applied and mathematical statistics. Discrete and continuous probability models, mathematical expectation, laws of large numbers, point estimation, confidence intervals, hypothesis testing, non-parametric techniques, applications. Students taking 218 are strongly urged to take 218L concurrently. Prerequisite: 155b or 170a or consent of instructor. FALL, SPRING. [3] Staff.

218L. Statistics Laboratory. Applications of the theory developed in 218. Emphasis on data analysis and interpretation. Topics covered include the one- and two-sample problems, paired data, correlation and regression, chi-square, model building. Examples are drawn from many disciplines. Corequisite: 218 or equivalent. FALL, SPRING. [1] Staff.

219. Introduction to Applied Statistics. A brief review of basic applied statistics followed by a development of the analysis of variance as a technique for interpreting experimental data. The generalized likelihood ratio principle, completely randomized designs, nested designs, orthogonal contrasts, multiple comparisons, randomized block designs, Latin squares, factorial designs, 2^n designs, fractional factorials, confounding, introduction to response surface methodology. Applications will be emphasized. Prerequisite: 218 or equivalent. SPRING. [3] Staff.

221. Theory of Numbers. The Euclidean algorithm, Euler's phi function, simple continued fractions, congruences, Fermat's theorem, Wilson's theorem, and elementary Diophantine equations. FALL, SPRING. [3] Gould, Tschantz.

223. Abstract Algebra. Fundamental properties of integers and polynomials. Elementary properties of groups, rings, integral domains, fields, and lattices. Prerequisite: linear algebra; except for students with strong backgrounds, 221 should be taken prior to 223. FALL, SPRING. [3] Staff.

226. Introduction to Numerical Mathematics. 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. Prerequisite: Computer programming and linear algebra, differential equations. FALL, SPRING. [3] Staff.

229. Advanced Engineering Mathematics. Vector analysis including directional derivatives, transformation of coordinates, divergence and curl. Line integrals, surface integrals, divergence theorem. Stokes' theorem. Functions of a complex variable, including limits, derivatives, 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: ordinary differential equations. SPRING. [3] Ahner.

234. Methods for Initial and Boundary-Value Problems. Construction of the solutions to initial- and boundary-value problems for partial differential equations using separation of variables in conjunction with Fourier series and integrals. Emphasis on obtaining explicit formulas for the solutions of various problems involving the heat equation, the wave equation, and Laplace's equation. Prerequisite: elementary differential equations. Recommended: linear algebra. FALL. [3] Schechter.

240. Transformation Geometry. 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: linear algebra. FALL. [3] Ratcliffe.

242. Topology of Surfaces. Fundamental concepts of topology, including properties of continuity, compactness, and connectivity. Topology of surfaces, triangulations, and the

fundamental group. Introduction to basic ideas of graph theory, vector fields, and Euclidean and hyperbolic geometry. SPRING. [3] Hughes.

246. Introduction to Actuarial Mathematics. Applications of calculus and probability to actuarial science. The mathematical foundations of financial mathematics including the theory of interest and multivariate probability distributions. Prerequisite: 170b or 175, and 216 or 218. FALL. [3] Hardin.

247. Probability. 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, applications. Prerequisite: multivariable calculus and linear algebra. Except for students with extremely strong backgrounds, 218 should be taken prior to 247. FALL. [3] Neamtu.

248. Mathematical Statistics. Distribution theory, order statistics, theory of point estimation and hypothesis testing, normal univariate inference, Bayesian methods, sequential procedures, regression, non-parametric methods. Students interested in applications may take 218L. Prerequisite: 247. SPRING. [3] Neamtu.

250. Introduction to Mathematical Logic. Development of the first order predicate calculus and fundamental metamathematical notions. FALL, SPRING. [3] Schechter.

251. Analytic Number Theory. Arithmetical functions, distribution of prime numbers, Dirichlet's theorem on primes in arithmetic progressions, Dirichlet series, and Euler products. Prerequisite: 221. [3] (Not currently offered)

252. History of Mathematics. The major developments of mathematics from ancient times to the early part of this century. Emphasis both on historical perspective and on the mathematics; assignments include many exercises and theorems. Prerequisite: completion of 170b or 175 or their equivalent and some algebra (preferably both linear algebra and abstract algebra). Especially recommended for teacher candidates. FALL. [3] L. Rafter.

253. Error-correcting Codes. The algebraic theory of error-correcting codes for information transmission. Block codes, the binary symmetric channel, length, rate and distance. Linear codes, bounds, syndrome decoding, perfect codes, Reed-Muller codes. Cyclic, BCH, and Reed-Solomon codes. Prerequisite: linear algebra. FALL. [3] J. Rafter.

259. Advanced Calculus. Properties of real numbers, 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 upper-division mathematics courses. Prerequisite: 170b or 175. FALL. [3] Staff.

260. Introduction to Analysis. Elementary topological concepts including compactness and completeness. Functions of several variables, continuity, differentiability, the Riemannian integral, inverse function theorem, implicit function theorem, and function spaces. Intended for students who desire a deeper understanding of the fundamental mathematical principles first encountered in calculus. Prerequisite: 170b or 175. SPRING. [3] Staff.

261. Complex Variables. Study of complex numbers, analytic and elementary functions, transformations of regions, properties of power series, including Taylor's and Laurent's. The calculus of residues with applications, conformal mapping with emphasis upon boundary value applications. Prerequisite: 196 or 198 or 208. SPRING. [3] Nicoara.

262. Mathematical Modeling in Biology. Mathematical modeling with applications in biology and medicine. Basic mathematical modeling tools such as linear regression, differential equations, matrix and statistical analysis, probability theory, and computer simulation. Mathematical models in population dynamics, epidemiology, immunology, diffusion phenomena,

pharmacokinetics, neurophysiology, and biochemistry of cells. Prerequisite: linear algebra and differential equations. SPRING. [3] Webb.

270. Differential Geometry. Curvature, torsion, vector fields, and the Frenet formulas for curves in R^3. Review of continuity and differentiation in R^n, Stokes' theorem and applications, fundamental forms and the shape operator, geodesics, and Gaussian curvatures for surfaces in R^3. The Euler characteristic and the Gauss-Bonnet Theorem. Prerequisite: 260. SPRING. [3] Kasparov.

272a–272b. Topology. 272a: Connectedness, compactness, countability, and separation axioms. Complete metric spaces. Function spaces. 272b: The fundamental group and covering spaces. Topology of surfaces. Simplicial complexes and homology theory. Homotopy theory. Prerequisite: 242. [3–3] Mihalik.

274. Combinatorics. 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). SPRING. [3] Ellingham.

275. Graph Theory. 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 of surfaces, especially the plane. Prerequisite: linear algebra. FALL. [3] Edelman.

280. Set Theory. 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: intermediate calculus and linear algebra. FALL. [3] Staff.

283a–283b. Modern Algebra. 283a: group theory through Sylow theorems and fundamental theorem of finitely generated abelian groups. 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: linear algebra. An elementary course in modern algebra (e.g., 231) is strongly recommended. 283a, FALL, Sapir; 283b, SPRING, Ol'Shanskiy. [3–3]

284. Lattice Theory and the Theory of Ordered Sets. 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, posets, free lattices. Prerequisite: 223 or equivalent. FALL. [3] Sapir.

286. Numerical Analysis. 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: 226. FALL. [3] Schumaker.

287. Nonlinear Optimization. An introduction to modeling, theory and methods for nonlinear optimization problems. Modeling of application problems in science and engineering. Methods of unconstrained optimization with one and several variables. Theory of constrained optimization, including Karush-Kuhn-Tucker conditions. Penalty functions and other methods of constrained optimization. Computer tools such as a subroutine library or symbolic algebra system. Prerequisite: Multivariable calculus, linear algebra, and computer programming. SPRING. [3] Ellingham.

288. Linear Optimization. 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: linear algebra and computer programming. FALL. [3] Ellingham.

292a–292b. Methods of Mathematical Physics. Hermitian forms, unitary transformations, group representations. Vector analysis, elements of differential geometry. Functions of a complex variable, calculus of residues, asymptotic expansions. Ordinary and partial differential equations of mathematical physics, boundary value problems, eigenfunction expansions. Integral equations, Hilbert space methods. Special functions, asymptotic properties. Integral transforms, generalized functions. Prerequisite: ordinary differential equations and linear algebra. [4–4] (Not currently offered)

294. Partial Differential Equations. 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: 198 or 208. FALL. [3] Horn.

297. Selected Topics. Topics of special interest at a level suitable for both senior undergraduate mathematics majors and graduate students in mathematics, as announced in the *Schedule of Courses*. FALL, SPRING. [Variable credit 1–3, total of all 267 and 297 hours not to exceed 12] Hardin.

298. Independent Study. Reading and independent study at a level considered introductory to graduate students or in an area of study not currently offered in 270–299 level range. FALL, SPRING. [Variable credit: 1–3]

309. Professional Development. The nature, history, and philosophy of mathematics; examination of various modern application areas; issues relating to being a professional mathematician such as ethics, teaching, and service; the use of Mathematica, TEX, the Web, and other resources with emphasis on techniques for communicating mathematics, both verbally and in writing. Prerequisite: one year of graduate study in the Department of Mathematics. SPRING. [3] Schumaker.

310. Lie Groups and Lie Algebras. Continuous groups; classical groups; real and complex Lie algebras; applications to physics, geometry, and mechanics. Prerequisite: linear algebra, advanced calculus. FALL. [3] Ol'Shanskiy.

312. Algebraic Topology. Homology, cohomology, homotopy theory. Prerequisite: 272a–272b. SPRING. [3] Yu.

323. Universal Algebra. Theory of general algebraic systems. Concepts discussed will include subalgebras, congruences, automorphism groups, direct and subdirect products, ultraproducts, free algebras, varieties and quasi-varieties, with applications to groups, rings fields, lattices, Boolean algebras, semilattices, and semi-groups. Connections with model theory and category theory will be included as time permits. Prerequisite: 283a. Corequisite: 283b. FALL. [3] Tsinakis.

324a–324b. Combinatorial and Geometric Group Theory. Generators and defining relations of groups; Cayley graphs and Van Kampen diagrams; subgroups and automorphisms of free groups; graphs of groups; fundamental groups of topological spaces; Magnus embedding; homology of groups; residual properties of groups; hyperbolic groups; small cancellation groups; 1-relator groups; algorithmic problems in groups. Prerequisite: 283a. [3–3] (Not currently offered)

325. Introduction to Approximation Theory. Best approximation in metric and normed vector spaces; Tchebycheff approximation, Weierstrass-type theorems, rational approximation, orthogonal polynomials, trigonometric approximation, moduli of continuity, spline approximation; expansions and bases in function spaces. Prerequisite: 261, 330a. [3] (Not currently offered)

330a–330b. Theory of Functions of a Real Variable. The real number system, transfinite numbers, spaces, point sets in metric spaces, sequences and series of functions, measure. Lebesgue integration, convergence theory, inversion of derivatives. [3–3] DiBenedetto.

331a–331b. Theory of Functions of a Complex Variable. Complex integration, calculus of residues, harmonic functions, entire and meromorphic functions, conformal mapping, normal families, analytic continuation, Riemann surfaces, analytic functions of several complex variables. [3–3] Zheng.

333. Theory of Ordinary Differential Equations. Existence and uniqueness theorems, systems of linear differential equations, self-adjoint eigenvalue problems, asymptotic behavior, stability properties, perturbation theory, and applications. Prerequisite: 247 or equivalent and linear algebra, or consent of instructor. [3] Zacher.

334. Theory of Partial Differential Equations. Equations of the first order. Classification of equations of second order, existence and uniqueness, methods for solving elliptic, parabolic, and hyperbolic equations. Prerequisite: advanced calculus, differential equations, and linear algebra, or consent of instructor. SPRING. [3] Staff.

355. Advanced Topics in Approximation Theory. Topics depend on the instructor but will typically include abstract approximation, classical approximation, multi-dimensional spline theory, and other advanced topics. Prerequisite: 330a. FALL. [3] Staff.

362a–362b. Functional Analysis. Function spaces, topological vector spaces, linear operators, conjugate spaces, Hilbert and Banach spaces, Banach algebras. Applications to function theory, differential equations, and integral equations. 362a, F ALL; 362b, SPRING. [3–3] Staff.

364a–364b. Nonlinear Differential Equations and Analytical Dynamics. 364a: classical dynamical systems. Lagrangian derivatives, canonical transformations, differential equations on the torus. Existence and continuation theorems, local and global questions. Equilibrium and periodic solutions, local integrals. Poincaré continuation method, characteristic exponents, stability, Liapunov theory. Integrable and Hamiltonian systems, perturbation theory, methods from functional analysis. 364b: surfaces of section, volume-preserving mappings, reduction to normal forms, fixed-point theorems, existence of integrals and convergence problems, Arnold-Moser theory on quasi-periodic motion and invariant tori. Abstract dynamical systems, ergodic properties, almost periodic motions, structural stability. Examples from celestial mechanics and other fields. [3–3] (Not currently offered)

367. Selected Advanced Topics. Topics of special interest at a level suitable for graduate students in mathematics, as announced in the *Schedule of Courses*. FALL, SPRING. [Variable credit: 1–3]

368. Advanced Independent Study. Reading and independent study in an advanced area of mathematics under the supervision of an adviser. Requires approval of director of graduate studies. FALL, SPRING. [Variable credit: 1–3]

369. Master's Thesis Research.

372a–372b. Seminar in Topology. Recent topics. (Depending on variation of topics, this course may be repeated.) [Variable credit: 1–3 each semester] Yu.

375a–375b Seminar in Graph Theory . Recent topics. (Depending on variation of topics, this course may be repeated.) [Variable credit: 1–3 each semester] Staff.

381a–381b. Seminar in Number Theory. Recent topics. Depending on variation of topics, this course may be repeated. [Variable credit: 1–3 each semester] (Not currently offered)

383a–383b. Seminar in Algebra. Recent topics. (Depending on variation of topics, this course may be repeated.) [Variable credit: 1–3 each semester] Staff.

385a–385b. Seminar in Approximation Theory. Recent topics. (Depending on variation of topics, this course may be repeated.) SPRING. [Variable credit: 1–3 each semester] Saff.

386a–386b. Seminar in Computational Mathematics. Recent topics. (Depending on variation of topics, this course may be repeated.) [Variable credit: 1-3 each semester] Staff.

390a–390b. Seminar in Analysis. Recent topics. (Depending on variation of topics, this course may be repeated.) FALL, SPRING. [Variable credit: 1–3 each semester] Bisch.

394a–394b. Seminar in Applied Analysis. Recent topics. (Depending on variation of topics, this course may be repeated.) [Variable credit: 1–3 each semester] Staff.

395a–395b. Seminar in Mathematical Biology. Recent topics. (Depending on variation of topics, this course may be repeated.) [Variable credit: 1–3 each semester] Staff.

398. Directed Study. A reading course designed to give graduate students mor e background. FALL, SPRING. [Variable credit: 1–3 each semester] Staff.

399. Ph.D. Dissertation Research.

Mechanical Engineering

CHAIR Robert W. Pitz
DIRECTOR OF GRADUATE STUDIES Nilanjan Sarkar
PROFESSORS EMERITI John H. Dunlap, William F. Flanagan, George T. Hahn, Donald L. Kinser, Barry D. Lichter, Robert L. Lott Jr., Arthur M. Mellor, James J. Wert, John W. Williamson
PROFESSORS Thomas A. Cruse, Michael Goldfarb, Dongqing Li, Robert W. Pitz, Carol A. Rubin, Alvin M. Strauss, Taylor G. Wang
RESEARCH PROFESSORS EMERITI J. Leith Potter, Robert A. Weeks
ADJOINT PROFESSOR Andrew A. Wereszczak
ASSOCIATE PROFESSOR Nilanjan Sarkar
RESEARCH ASSOCIATE PROFESSOR Amrutur V. Anilkumar
ADJOINT ASSOCIATE PROFESSOR Joseph A. Wehrmeyer
ASSISTANT PROFESSORS Eric J. Barth, Deyu Li, Greg Walker
SENIOR LECTURER Robert J. Barnett

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

THE program in mechanical engineering allows concentration in a variety of areas of mechanical engineering r esearch. Candidates for the master of science degree must complete 24 hours of course work and an

acceptable master's thesis. The course work must include at least 12 hours at or above the 300 level, and a minor of at least 6 hours in courses separate from, but related to, the field of study. The Ph.D. program requires 36 hours of course work beyond the bachelor's degree (with a minimum of 24 hours completed at Vanderbilt) and an acceptable dissertation. This course work must include a 6-hour minor in an area separate from, but related to, the field of study. At least 18 hours of the 36 must be at or above the 300 level. A maximum of 6 hours in independent study may be included in the 36-hour requirement. The master of engineering, an advanced professional degree, is offered by the School of Engineering. There is also a master of science/doctor of medicine degree program joint between Mechanical Engineering and the School of Medicine. Details may be obtained from the director of graduate studies in Mechanical Engineering.

251. Modern Manufacturing Processes. Introduction to manufacturing science and processes. A quantitative approach dealing with metals, ceramics, polymers, composites, and nanofabrication and microfabrication technologies. FALL. [3]

259. Engineering Vibrations. 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: 190, Math 198. SPRING. [3]

260. Energy Conversion I. 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: 220b, 224. FALL. [3]

261. Basic Airplane Aerodynamics. Includes aerodynamic forces, airfoil characteristics from both theory and experiment, aircraft experiment, aircraft performance, longitudinal and lateral stability and control. Prerequisite: 224. FALL. [3]

262. Environmental Control. A study of heating and cooling systems, energy conservation techniques, use of solar energy and heat pumps. Prerequisite: 220b; corequisite: 248. SPRING. [3]

263. Intermediate Fluid Mechanics. Mathematical and computational modeling of incompressible viscous fluid flows. Tensor notation; derivation of the Navier–Stokes equations; exact solutions; numerical and computational techniques; turbulence modeling. Prerequisite: 224. FALL. [3]

264. Internal-Combustion Engines. A study of the thermodynamics of spark ignition and compression ignition engines; gas turbines and jet propulsion. Prerequisite: 220b. SPRING. [3]

265. Direct Energy Conversion. 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. Students who have earned credit for EECE 269 may not receive credit for ME 265. Prerequisite: 220a. SPRING. [3]

267. Aerospace Propulsion. Application of classical mechanics and thermodynamics principles to the study of rocket and aircraft propulsion. Design and performance analysis of air-breathing and chemical rocket engines. Advanced propulsion systems for interplanetary travel. Prerequisite: 220b, 224. SPRING. [3]

271. Introduction to Robotics. (Also listed as Electrical Engineering 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: 190, Math 194. FALL. [3]

275. Introduction to Finite Element Analysis. Development and solution of finite element equations for solid mechanics and heat transfer problems. Introduction to commercial finite element and pre- and post-processing software. Two lectures and one three-hour laboratory each week. Prerequisite: CE 182, Math 198. SPRING. [3]

280. Advanced Dynamics of Mechanical Systems. 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: 190, Math 198. SPRING. [3]

284. Modeling and Simulation of Dynamic Systems. 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: 234. FALL. [3]

320. Statistical Thermodynamics. 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. Introduction to Gibbs method. Prerequisite: 220b. FALL. [3]

324. Low Reynolds Number Flow. Dynamics of incompressible fluids in situations where viscous effects are significant or dominant. Review of the Navier-Stokes equations; exact solutions to the Navier-Stokes equations; laminar jets and wakes; microhydrodynamics; fluid stability. Prerequisite: 263 or equivalent. SPRING. [3]

325. High Reynolds Number Flow. Dynamics of incompressible fluids in situations where viscous effects are typically small. Review of the Navier-Stokes equations; two- and three-dimensional potential flows, with applications to thin airfoil theory and free streamline theory; inviscid flows with vorticity; boundary layer theory; fundamental turbulence theory. Prerequisite: 263 or equivalent. SPRING. [3]

326. Gas Dynamics. 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: 224. SPRING. [3]

327. Energy Conversion Systems. An advanced study of energy conversion systems that include turbomachinery, positive displacement machinery, solar energy collection and combustion, with consideration for optimizing the systems. Prerequisite: consent of instructor. FALL. [3]

331. Robot Manipulators. (Also listed as Electrical Engineering 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 nonlinear control, and force control manipulators. Prerequisite: 271. SPRING. [3]

333. Topics in Stress Analysis. An investigation of thermal stress, transient stress, and temperatures in idealized structures: consideration of plasticity at elevated temperatures; and some aspects of vibratory stresses. Prerequisite: consent of instructor. FALL. [3]

336. Linear Control Theory. 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. Credit is given for only one of ME236 or ME336. Prerequisite: 234. FALL. [3]

343. High-Performance Computing for Engineers. (Also listed as Computer Science 343) Introduction to high-performance computing. Engineering applications. Focus on high-speed cluster computing. Class project applying high-performance computing to various research topics. SPRING. [3]

348. Convection Heat Transfer. 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: 248, 325a. SPRING. [3]

352. Nonlinear Control Theory. Introduction to the concepts of nonlinear control theory. Topics include phase plane analysis, nonlinear transformations, Lyapunov stability, and controllability/observability calculations. A multidimensional geometric approach to these problems is emphasized. Prerequisite: Math 194. SPRING. [3]

353. Design of Electromechanical Systems. Analog electronic design for purposes of controlling electromechanical systems, including electromechanical sensors and actuators, analog electronic design of filters, state space and classical contollers, and transistor-based servoamplifiers and high voltage amplifiers. The course has a significant laboratory component in which students are expected to design and fabricate circuits to control electromechanical systems. Implementation of digital controllers is also covered. Prerequisite: 234. FALL. [3]

355. Engineering Design and Optimization. Methods for optimal design of mechanical systems are developed and applied. Nonlinear optimization strategies are implemented through progressive exercises on unconstrained and constrained optimization problems with single and multiple design variables. Students explore the implementation of basic algorithms through computer-based tools and available Fortran (or C) subroutines. Feasibility and optimality conditions and design problem formulation are emphasized. Computer literacy and some programming experience are required. Each student is expected to complete a major design project in their area of technical interest. [3] (Offered on demand)

356. Mechanical System Reliability. Design of mechanical systems subject to reliability constraints. Emphasis on response surface modeling, variance reduction concepts, probabilistic design methods and advanced simulation concepts with application development using reliability software. Prerequisite: 355 and either CE 310 or Math 233. [3] (Offered on demand)

359. Advanced Engineering Vibrations. 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: 259; Math 234, Math 294. SPRING. [3]

363. Conduction and Radiation Heat Transfer. 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: 248. SPRING. [3]

365. Micro/Nanoscale Energy Transport. Theoretical examination of energy transpor t 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. FALL. [3]

366. Combustion. Introduction to combustion processes. Topics include combustion thermodynamics, chemical kinetics, premixed flame theory, diffusion flame theory, ignition and detonation. Prerequisite: 220b, 224. FALL. [3]

369. Master's Thesis Research.

389. Master of Engineering Project. Not for M.S. or Ph.D. students. [0]

391–392. Special Topics. A course based on faculty research projects and highly specialized areas of concentration. [Variable credit: 1–3 each semester]

393–394. Independent Study. Readings and/or projects on advanced topics in mechanical engineering under the supervision of the faculty . Consent of instructor r equired. [Variable credit: 1–3 each semester]

397–398. Seminar. [0–0]

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Microbiology and Immunology

CHAIR Jacek Hawiger
DIRECTOR OF GRADUATE STUDIES Eugene M. Oltz
PROFESSORS EMERITI John H. Hash, David T. Karzon
PROFESSORS Christopher R. Aiken, Dean W. Ballard, Mark R. Boothby, James Crowe, Richard T. D'Aquila, Terence S. Dermody, Jacek Hawiger, J. Harold Helderman, George C. Hill, Sebastian Joyce, Alexander R. Lawton, Eugene M. Oltz, Theodore Pincus, Donald H. Rubin, H. Earl Ruley, Subramaniam Sriram, James Ward Thomas, Luc Van Kaer, Peter F. Wright, Mary Zutter
ASSOCIATE PROFESSORS Thomas N. Aune, Joey V. Barnett, Timothy Cover, Mark R. Denison, G. Neil Green, David W. Haas, Douglas Kernodle, Andrew J. Link, Geraldine G. Miller, Louise A. Rollins-Smith, Derya Unutmaz
ASSISTANT PROFESSORS Hong Fang, Spyros Kalams, Wasif N. Khan, Borden Lacy, Erik Skaar
RESEARCH ASSISTANT PROFESSORS Robert S. Carter, Xue-Yan Liu, Chang-Yuan Ni, Maria Pia G. Pasquale, Lan Wu
RESEARCH INSTRUCTORS Shreevrat Goenka, Danya Liu, Yi-An Lu, Ruth Ann Veach, Jin-Long Yang, Qitao Yu, Jing Zhou

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

STUDENTS interested in microbiology and immunology participate in the Interdisciplinary Graduate Program in the Biomedical Sciences during their first year (see Biomedical Sciences). The second year of study

comprises required and elective courses in Microbiology and Immunology for a total of at least 24 hours of formal course work toward the Ph.D. degree.

The program in microbiology and immunology is designed to provide a broad background in modern virology, molecular and cellular immunology, molecular genetics and pathogenesis, functional genomics, biodefense, and biotechnology. Research experience in a specific area provides the basis for a dissertation. Entering students normally serve brief apprenticeships in the laboratories of three faculty members during the first year as preparation for choosing a field of study (see course description of Microbiology 327). Dissertation research may be initiated in any of the following areas:

- Signal transduction and gene transcription in T and B cells; developmental immunology and cell-mediated immunity in parasitic and viral infections *(Aune, Ballard, Boothby, Crowe, Hill, Joyce, Khan, Miller, Olsen, Oltz, Rollins-Smith, Sriram, Thomas, Unutmaz, Van Kaer);*
- Molecular biology of viruses, including DNA- and RNA-containing tumor viruses *(Aiken, Crowe, D'Aquila, Denison, Dermody, Rubin, Ruley);*
- Molecular cell biology of inflammation (*Hawiger, Oltz, Ruley, Van Kaer*);
- Mechanism of action of toxins *(Cover, Green, Hawiger, Lacy, Skaar);*
- Molecular genetics *(Fang, Green, Link, Ruley, Skaar);*
- Functional genomics, structure, and proteomics *(Green, Hawiger, Lacy, Link, Oltz, Ruley, Van Kaer).*

Emphasis is on basic research aimed at understanding molecular mechanisms of microbial and parasitic infections and the defenses mounted by the immune system. Students whose interests are primarily in diagnostic or taxonomic aspects of microbiology are not encouraged to apply.

Doctoral study is emphasized. However, M.S. degrees are granted under special circumstances and require a research thesis.

327. Experimental Methods in Microbiology. Laboratory work concerned with (a) regulation of gene transcription; (b) signal transducing molecules and pathways; (c) entry and replication of mammalian viruses; (d) techniques in nucleic acid and peptide chemistry, rapid methods of DNA sequencing, gene knock-out in transgenic animals, design of probes, antigens, and synthetic vaccines; and (e) structure-function analysis of ligands, receptors, toxins, and transcription factors. Available only to M&IM students. Admission to course, hours, and credit by arrangement. FALL, SPRING, SUMMER. [2–4] Staff.

328. Microbes and Immunity. A lecture series on selected topics. The course may be taken once in each of the following subject areas for a maximum total credit of 8 hours.

328 2. Molecular Virology. The interaction of animal viruses with their host cells, discussed at the molecular and cellular level as model systems. Special emphasis on current literature and methodology. Prerequisite: A course in biochemistry. FALL. [3] Dermody.

328 3. Molecular and Cellular Immunology. The cellular and molecular foundations of the immune response system and the humoral and cellular reactions that result from immunologic interactions. Two lectures per week and seminars presented by students. Prerequisite: IGP 300a, 300b, and 301, or equivalent. FALL. [3] Joyce and Staff.

328 4. Focal Topics in Microbiology and Immunology. The main objective of this course is to guide students through "real life" cases illustrating dynamic features (entry, colonization, spread, injury, immune response) of the pathogen-host relationship. Small discussion groups led by a faculty preceptor will focus on twelve topics contained in booklets designed for self-directed study. The element of critical thinking in analysis of questions, concepts, and required literature will be introduced. Moreover, graduate students will gain "clinical perspective" to the molecular pathogenesis of microbial and immune diseases important for future research proposals and grant applications. Prerequisite: IGP 300a, 300b, 301, or equivalent. *Note: Interested students must discuss their qualifications with the course director prior to enrolling.* SPRING [2] Staff.

332. Foundations in Microbiology and Immunology I. The objectives of this course are to alert students to important original research articles in microbial genetics and pathogenesis, to apply methods of scientific logic for critical analysis of the knowledge presented in the articles, and to help students present complex data and conclusions to an audience. SUMMER. [2] Fang and Staff.

333. Foundations in Microbiology and Immunology II. Second semester of required course work. Original research articles focus on virology. Prerequisite: M&IM 332. FALL. [3] Ruley and Staff.

334. Foundations in Microbiology and Immunology III. Third semester of required course work. Original research articles focus on immunology. Prerequisite: M&IM 332 and 333. SPRING. [1] Boothby and Staff.

335. Research Proposals: Preparation and Critical Review. An essential skill for scientists in an academic setting is the ability to obtain extramural research funding through peer reviewed grant applications. This course will offer didactic sessions in which the process of preparing and reviewing grant applications is discussed. Each student will write a grant application using the NRSA format for postdoctoral fellowships. The student should propose research in one of the four major emphasis areas of the department: microbial genetics, virology, immunology, or microbial pathogenesis. The initial grant submission will be reviewed by a faculty mentor. The student will amend the application according to the reviewer's comments and submit a final version. Procedures for reviewing grant applications will then be discussed. Two students and the original faculty mentor will provide a written review for each of the final grants. The course will conclude with a mock NIH study section in which grants are reviewed orally and scored. SPRING. [1] Crowe (Director), Thomas, Cover.

351. Functional Genomics and Proteomics: Applications to Immunobiology. Biological applications of functional genomics and proteomics in immunology. Topics include: 1) proteomic analysis of blood cells, vascular endothelial cells, and smooth muscle cells involved in immunity and inflammation, 2) functional genomics of immunobiology using genome-wide mutagenesis, 3) gene expression profiling of immune/inflammatory responses based on DNA microarray technology, 4) peptide/protein transduction and its applications to cell-based proteomics and intracellular protein therapy, 5) proteomic analysis of MHC antigens, 6) genomics and proteomic analysis of host-pathogen interactions, 7) genomic and proteomic analysis of immunological diseases, and 8) development and application of new genomic and proteomic strategies in immunology. SPRING. [2] Link, Hawiger, Staff.

352. Special Topics in HIV/AIDS Research. During the past twenty years since the identification of the AIDS virus, significant advances in understanding the disease have been made through basic studies of HIV replication, virus host-cell interactions, viral pathogenesis using SIV animal models, and clinical studies of disease progression and manifestations. This course will review recent advances in AIDS research as a platform for discussions of the current research frontiers, with an emphasis on interactions of the virus with host cells. SPRING. [3] Aiken.

369. Master's Thesis Research.

377. Critical Issues in Cancer Biology. This seminar/tutorial will examine primary research papers to develop critical thinking skills on current topics in cancer research, including: cell growth control, signal transduction, regulation of gene expression, programmed cell death. The discussions will focus on discr edited and controversial areas as well as cutting edge studies. Students can write a paper for additional credit. This course is offered to graduate students only. Post doctoral fellows may audit if space permits by permission of the instructor. Prerequisite: IGP 300a, 300b, and 301, or equivalent. SUMMER. [2–3] Ruley .

398. Preliminary Doctoral Research. Non-qualifying hour course for students in the Ph.D. program who have not yet passed their qualifying exam. Pr erequisite: IGP 300a and IGP 300b or equivalent. FALL, SPRING, SUMMER. [Variable credit: 0–12] Staff.

399. Ph.D. Dissertation Research.

Molecular Physiology and Biophysics

CHAIR Alan D. Cherrington
VICE CHAIR Albert H. Beth
DIRECTOR OF GRADUATE STUDIES Hassane Mchaourab
PROFESSORS Albert H. Beth, Matthew D. Breyer, G. Roger Chalkley, Alan D. Cherrington, Roger J. Colbran, Jackie D. Corbin, Stephen N. Davis, Emmanuele DiBenedetto, John H. Exton, John C. Gore, Daryl K. Granner, Jonathan L. Haines, Robert MacDonald, Mark A. Magnuson, James M. May, Richard M. O'Brien, Jane H. Park, David W. Piston, Roland W. Stein, Kevin Strange, Arnold Strauss, David H. Wasserman, P. Anthony Weil, John P. Wikswo Jr.
RESEARCH PROFESSORS Sharron H. Francis, K. Sam Wells
ASSOCIATE PROFESSORS Eric Delpire, Ronald B. Emeson, Aurelio Galli, Owen P. McGuinness, Hassane Mchaourab, Alvin C. Powers, Linda Sealy, Phoebe L. Stewart, Marshall Summar, James S. Sutcliffe, Jeanne Wallace, Scott Williams, Danny G. Winder
RESEARCH ASSOCIATE PROFESSORS Charles E. Cobb, Robert Matthews, Mary C. Moore
ASSISTANT PROFESSORS Maureen Gannon, Alyssa Hasty, Anne K. Kenworthy, Shawn E. Levy, Douglas P. Mortlock, Marylyn DeRiggi Ritchie, Masakazu Shiota, Edwin J. Weeber, Chao-Lan Yu
RESEARCH ASSISTANT PROFESSORS Robert K. Hall, Eric Hustedt, Richard L. Printz
INSTRUCTORS Michael McCaughey, Joseph Solus, Richard R. Whitesell
RESEARCH INSTRUCTORS Sheng-Song Chen, Fu-Yu Chueh, Hanane Koteiche, Heinrich Matthies, Jonathan Rocheleau, Chiyo Shiota, Richard Stein

DEGREE OFFERED: *Doctor of Philosophy*

STUDENTS interested in this pr ogram participate in the Inter disciplinary Graduate Pr ogram in the Biomedical Sciences during the first year (see Biomedical Sciences). The second year comprises r equired and elective courses in Molecular Physiology and Biophysics for a total of at least 24 hours of formal course work towar d the Ph.D. degr ee. Variations are

permitted in the number of formal course hours above the minimum of 24 required for the degree. A thesis-based master's degree is awarded only under special circumstances.

The emphasis of the graduate program is on research and research training in the areas of molecular and cell biology, cellular regulation and endocrinology, electrophysiology and biophysics, whole animal physiology, and genetics. Students obtain a general background in physiology, biochemistry, molecular biology, and genetics through course work and laboratory exercises. Students are encouraged to rotate freely among various research laboratories with interests in the areas mentioned above in order to select a particular area and thesis adviser for dissertation research.

Research areas available to the student include hormonal and developmental aspects of gene control at the molecular level, with emphasis on the role played by DNA-protein interactions. There is also a focus on cellular aspects of hormonal regulation including mechanisms of glucose, fatty acid and ion transport, as well as the mechanism of action of hormonal second messengers such as cAMP, cGMP, and Ca2+. Studies are conducted, using various biophysical techniques, to study membrane function and the action of proteins in membranes and free solution, with a focus on the regulation of synaptic transmission. Studies are also carried out to investigate the hormonal regulation of metabolism in whole animal models. Examination of the genetic basis of neurological and metabolic disorders is also ongoing in the department. Research in the department has relevance to a range of human diseases including diabetes, cancer, nutritional deficiencies, and developmental abnormalities.

321. Physiology. Lectures and clinical correlations designed to cover the essentials in physiology for first year medical students. This course or MP&B 330 is required of all graduate students majoring in Molecular Physiology and Biophysics. Class meeting dates are determined by the calendar of the School of Medicine. SPRING. [5] McGuinness and Staff.

322. Physiological Techniques and Preparations. For advanced students prior to admission into candidacy for Ph.D. degree. FALL, SPRING, SUMMER. Hours and credit by arrangement. Cherrington and Staff.

323. Excitable Membrane Properties in Nerve and Muscle. (Also listed as Pharmacology 323 and Neuroscience 324) Recent findings concerning the structure, function, and pharmacology of ion channels. Topics will include the relationship between amino acid sequence, protein subunit structure, and function of both voltage- and ligand-gated channels; the relationship between channel structure and pharmacology; the interaction of drugs with channels and receptor/channel proteins, with special emphasis on the interaction of compounds with different functional channel states; indirect coupling between ion channels and neurotransmitter and hormone receptors. Classes will include both presentations by the instructors and discussion of recent publications by students. Prerequisite: consent of instructor. FALL, even numbered years. SPRING. [3] Winder, DeFelice (Pharmacology).

324. Tutorials in Physiology. The class meets once weekly. In the fall semester, graduate students critically evaluate research publications in areas of active research in the department (e.g., gene transcription, molecular biology, electrophysiology, membrane transport, intercellular signaling, beta cell biology, and regulation of intermediary metabolism). Also, there are faculty presentations on ancillary science skills, such as oral and poster presentations, and grant and proposal writing. In the spring semester, each student presents and

defends a short research proposal based on their current research area. FALL, SPRING. [1] Mchaourab and Staff.

325. Physical Measurements on Biological Systems. (Also listed as Physics 325 and Biomedical Engineering 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. One lecture and one recitation. Prerequisite: modern physics course or consent of instructor. FALL, odd numbered years. [3] Wikswo.

326. Exercise Physiology. The responses of different physiological systems to exercise. The effect and role of exercise under special conditions such as diabetes, reproduction, heart disease, and orthopedics and rehabilitation. Invited speakers will discuss the clinical and scientific aspects of the above topics. Prerequisite: consent of instructor. SPRING. [1] Wasserman.

327. Molecular Endocrinology. A survey of the molecular biology of hormone action from the target cell surface to the nucleus, equally divided between steroid and peptide hormones. Special emphasis on (i) diabetes and obesity and (ii) how receptors and intracellular messengers mediate hormone action, and (iii) how hormones regulate gene expression. Discussion of the use of genetic, molecular biology, and biochemical techniques to study hormone action. The faculty encourage an interactive atmosphere in the class through the discussion of seminal papers. FALL. [2] Colbran and O'Brien.

328. Metabolic Regulation in vivo. The hormonal regulation of fuel metabolism in the whole animal. Techniques used to study carbohydrate, lipid, and protein metabolism in vivo, as well as metabolic regulation in the normal and stressed state. Conditions such as fasting, exercise, infection, and hypoglycemia. A basic knowledge of physiology and biochemistry is required. Prerequisite: 321 or consent of instructor. FALL, odd numbered years. [2] McGuinness and Staff.

330. Human Physiology and Molecular Medicine. Lectures and research correlations on advanced aspects of human physiology, with emphasis on communication between and control of the major tissue types and organ systems. Recent biochemical and molecular biology research findings will be incorporated into the study of normal physiology and pathophysiology. This course (or MP&B 321) is required of all graduate students majoring in Molecular Physiology and Biophysics. Prerequisite: consent of instructor. FALL. [3] Cobb.

331. Medical Physiology Lectures. This is a 4-credit-hour version of MP&B 321, Medical Physiology, that involves attendance and testing over the same course lectures without the clinical correlation sessions required of medical students. SPRING. [4] McGuinness and Staff.

332. Regulation of Gene Transcription. Factors affecting DNA/protein interactions. The most recent findings on how such interactions are established within the chromosomal environment and how those interactions affect gene activity. Hormonal and developmental aspects of gene control within the context of protein/DNA interactions. Prerequisite: BCHM 321 or consent of instructor. SPRING, odd numbered years. [2] Stein and Staff.

340. Human Genetics I. Designed to cover background and latest advances in human genetics. Topics will include an overview of mutational mechanisms, cytogenetics (detection and description of chromosomal abnormalities), biochemical genetics (gene defects in biochemical pathways), molecular genetics (gene structure, function, and expression), population genetics (heritability, quantitative traits, variance analysis), disease gene discovery (study design, statistical and molecular techniques), and genetic epidemiology (genetic linkage analysis, association studies, gene-gene and gene-environment interaction). Topics will be discussed with reference to specific human genetic diseases. FALL. [3] Summar and Staff.

341. Human Genetics II. This course will cover the statistical, population, and analytical aspects of modern human genetics research. Topics to be covered include human population genetics, quantitative genetics, linkage and association analyses, computational genetics, and evolutionary genetics. Clinical examples, subject ascer tainment, and study design will also be emphasized. Students must have a strong understanding of Mendelian genetics and basic biostatistics. Prerequisite: consent of instructor. SPRING. [3] Haines and Staff.

345. Cellular and Molecular Neuroscience. (Also listed as Cell and Developmental Biology 345, Neuroscience 345, Pharmacology 345) Students are exposed to fundamental concepts and techniques in molecular and cellular neuroscience and provided with a theoretical context for experimental analysis of brain function. The course is divided into four modules*Module I: Biophysics and Biochemistry of Synaptic Transmission* reviews biophysical and molecular concepts relating to membrane excitability, action potential generation and propagation, and the molecular basis of chemical signaling at synapses. *Module II: Synaptic Integration and Plasticity* discusses mechanisms and models of synaptic integration and plasticity and concentrates on how molecular changes translate into alter ed synaptic strength and gene expression programs that underlie short and long-term plasticity. *Module III: Neural Development* examines historical and curr ent concepts in neural patter n formation, neural migration, axon guidance and synapse for mation. *Module IV: Neural Diseases and Disease Models* focuses on specific brain disor ders such as epilepsy , depression, schizophrenia, and Alzheimer's disease and curr ent models used to investigate their origin and/or treatment. This course combines faculty lectur e with discussion of original ar ticles, with an emphasis on student participation. SPRING. [4] Blakely, Carter, and Staff.

349. Genetics of Model Organisms. Basic genetic principles across a broad range of organisms (yeast, c. elegans, dr osophila, Arabidopsis, mouse, zebrafish) that ar e used to investigate molecular and developmental pathways of interest for human disease will be presented. This course focus will pr ovide students with in-depth ter minology and understanding of the advantages, applications, and approaches specific to each organism. Genomic and bioinformatics tools that facilitate genetic analysis in each species will be emphasized. Specific examples of how each model organism has successfully contributed to defining a human disorder will be presented. Course combines faculty lectur es with discussion of original ar ticles and hands-on computer time for demonstration of statistical packages. SPRING. [2] Southard-Smith and Staff.

369. Master's Thesis Research.

370. Tutorials in Human Genetics. A weekly seminar critically evaluating cur rent and past scientific literature from many areas of genetic research. The focus will be on study methods and analysis. FALL. [1] Canter.

371. Tutorial in Statistical and Population Genetics. The class meets once weekly. Graduate students critically evaluate research publications in areas of statistical methods in human genetic analysis and in the area of human population genetics. Also, there are faculty presentations on ancillary science skills, such as oral and poster pr esentations, and grant and proposal writing. SPRING. [1] Li, Ritchie.

380. Genetic Analysis of Complex Human Diseases. Designed to cover study design and application issues of disease gene discover y with specific reference to common clinical traits. Topics will include an overview of study design issues, clinical ascertainment and trait description, methods of genetic data generation, and methods of data analysis. Examples are derived from pharmacogenetics, medical genetics, and car diovascular genetics, among others. Prerequisite: Physiology 340 and consent of instructor. Summer. [1] Haines, Moore, and Staff.

385. Fundamentals of Genetic Analysis. This course is designed to accomplish three goals: (1) introduce students to critical topics of genetic research, (2) introduce students to important areas of genetic research not covered in first-year course work, and (3) promote an understanding of classical genetic analysis by learning genetics using the original literature. The approach will be to use classic literature that defined significant problems in genetic research. Specific topics will include: genetic analysis (segregation, independent assortment and locus mapping), human pedigree analysis and disease gene mapping, and population/quantitative genetics. FALL. [4] Williams and Staff.

399. Ph.D. Dissertation Research.

Neuroscience

DIRECTOR Elaine Sanders-Bush
DIRECTOR OF GRADUATE STUDIES Louis J. DeFelice
PROFESSORS Michael Aschner, Jeffrey R. Balser, Randolph Blake, Randy D. Blakely, A. B. Bonds, Kendal Broadie, Vivien A. Casagrande, Jeffrey Conn, Louis J. DeFelice, Ariel Y. Deutch, Ford F. Ebner, Alfred L. George Jr., John Gore, Jonathan L. Haines, Heidi E. Hamm, Stephan Heckers, Carl H. Johnson, Jon H. Kaas, Pat Levitt, Robert L. Macdonald, Douglas McMahon, Timothy P. McNamara, Terry Page, John S. Penn, Elaine Sanders-Bush, Jeffrey D. Schall, Subramaniam Sriram, Kevin Strange, Ronald G. Wiley, Laurence J. Zwiebel
ASSOCIATE PROFESSORS Jo-Anne Bachorowski, Bruce D. Carter, Kenneth C. Catania, Chin Chiang, Roger J. Colbran, Eric Delpire, Ronald B. Emeson, Isabel Gauthier, Vsevolod Gurevich, Craig Kennedy, René Marois, David M. Miller III, Thomas J. Palmeri, Sohee Park, Anna Roe, Bih-Hwa Shieh, Lilianna Solnica-Krezel, James S. Sutcliffe, William M. Valentine, Brian E. Wadzinski, Mark Wallace, Danny G. Winder
ASSISTANT PROFESSORS Bruce H. Appel, Michael Cooper, Kevin Currie, Aurelio Galli, Peter Hedera, Greg Mathews, Michael P. McDonald, Bethann McLaughlin, David Noelle, Daniel Polley, Marilyn DeRiggi Ritchie, Andrew Rossi, Michelle Southard-Smith, Frank Tong, Donna Webb, Edwin Weeber, David H. Zald

DEGREE OFFERED: *Doctor of Philosophy*

☙ THE program of study provides a broad background in neuroscience and related disciplines, preparing a student for a career as a research investigator and teacher. Graduates are recruited for positions in academic institutions where the discipline of neuroscience is growing rapidly, in government and research institutes, and in the biotechnology industry.

The Ph.D. program requires a minimum of 24 hours of formal course work. Two areas of focus (tracks) are available: molecular and integrative. Students in the molecular track participate in the IGP (see Biomedical Sciences); during the first year, they complete an interdisciplinary core of course work through the IGP. A required set of modules includes three courses, of which the student chooses two. These courses include Cellular

and Molecular Neuroscience, Systems Neuroscience, and Cognitive Neuroscience. These courses survey the br oad areas of neuroscience and are designed to link fundamental principles to contemporary r esearch. Neuroscience Foundations, another r equired course, is taught the first and second semesters of the first year . Additional required courses include neuroanatomy and advanced courses covering the electrical properties of nerves, molecular neuroscience, cognitive neuroscience, and biostatistics. An individualized elective schedule is designed that augments the required material in ar eas that r elate directly to the chosen r esearch, which begins in the summer of the first year. Areas of study include bases of perception, cognition and cir cadian rhythms, neural development, synaptic transmission, synaptic and systems plasticity, sensory perception and processing, neuropharmacology, neurotoxicology, neurogenetics, the etiology and tr eatment of neur opsychiatric and neur odegenerative diseases, and behavioral neur ophysiology. An original research dissertation is required for the Ph.D. degree.

For additional information, see *http://braininstitute.vanderbilt.edu*.

302. Techniques and Preparations. Laboratory rotations undertaken by Integrative Track students that culminate in the selection of a thesis adviser. FALL, SPRING. [0–6]

320. Neuroscience Research Forum. Required of all students, and second-year students are required to take this course for credit. Students make oral presentations and are evaluated based on the clarity of the pr esentation and visual aids, as well as the ability of the pr esenter to answer questions. The course meets ever y other week for 1.5 hours with two students presenting at each session. FALL, SPRING. [1]

323. The Nervous System. (Also listed as Cell and Developmental Biology 323) Emphasis on providing second-year medical students and graduate students with a solid understanding of the organization of the human central nervous system, integrating basic information from neuroanatomy, neurophysiology, and neur ochemistry. Covers the most up-to-date research conducted in neur obiology, with emphasis on r esearch with potential clinical significance. Clinical material is pr ovided by patient pr esentations, discussions of the impact of neurological disease on patients and their loved ones, and by an analysis of pathological cases. Four hours lectur e and four hours laborator y per week. Micr oscope rental fee is required. FALL [4] Norden.

324. Excitable Membrane Properties in Nerve and Muscle. (Also listed as Pharmacology 323 and Molecular Physiology and Biophysics 323) Recent findings concer ning the structure, function, and phar macology of ion channels. T opics will include the r elationship between amino acid sequence, protein subunit structure, and function of both voltage- and ligand-gated channels; the relationship between channel structure and pharmacology; the interaction of drugs with channels and receptor/channel proteins, with special emphasis on the interaction of compounds with dif ferent functional channel states; indir ect coupling between ion channels and neur otransmitter and hor mone receptors. Classes will include both presentations by the instructors and discussion of r ecent publications by students. Prerequisite: consent of instructor. SUMMER. [3] DeFelice and Winder.

325. Neuroscience Foundations. This two-semester course pr ovides discussions on a broad range of neur oscience topics, ranging from reviews of historical concepts and individuals in neur oscience to science jour nalism. Other topics include scientific ethics, science policy, good grantsmanship, and communication skills. F ALL, SPRING. [1–1] Sanders-Bush, Early-Zald.

329. Molecular Basis of Psychotropic Drug Action. (Also listed as Pharmacology 329) This advanced course focuses on the mechanism of action of CNS-active drugs, with extensive literature reading and student presentations. Each section will focus on the mechanism of action of a drug class, including classical behavioral and biochemical studies, as well as genetic and molecular analyses of drug action. Prerequisite: 345 or Pharmacology 324–325, or consent of instructor. SPRING. [2] Sanders-Bush.

330. Cognitive Neuroscience. This course provides a broad understanding of the state of our knowledge in cognitive neuroscience. The emphasis is on the findings and concepts in the major branches of cognitive neuroscience, rather than techniques (although these will be discussed). The level of analysis will focus on human and non-human primate systems. Prerequisite: an introductory-level undergraduate course in neuroscience or physiological psychology. Basic knowledge of experimental cognitive psychology is desirable but not necessary. FALL. [3] Marois.

331. Advanced Topics in Mammalian Brain Development. Focuses on a specific topic in contemporary mammalian brain development. Areas of focus may include the role of early experience in the development of brain circuitry, growth factors as pleiotrophic molecules in brain development, or the mechanisms that control the development of the cerebral cortex. FALL. [2]

335. Special Topics in Neuroscience (Also listed as Cell and Developmental Biology 335 and Psychology 335). Explores basic issues in neuroscience. Possible topics include neural development, neural plasticity, regeneration, organization and function of cortex, sensory systems, motor systems, and research methodology in neuroscience. A new topic is considered each semester. Prerequisite: Neuroscience 323 or equivalent course. FALL. [2] Casagrande.

336. Advanced Neuroanatomy (Also listed as Cell and Developmental Biology 336). Designed for graduate and medical students who want to explore in more detail topics covered in Neuroscience 323. Emphasis on advanced neuroanatomical techniques (electron microscopy, freeze-fracture, fluorescence microscopy), on an understanding of original current research conducted in neuroanatomy, and on clinical correlations. Students may elect to emphasize clinical correlations and do three five-week rotations in various subfields of neurobiology (neuro-oncology, surgery, etc.). Admission by consent of instructor. FALL, SPRING, SUMMER. [2] Norden.

340. Systems Neuroscience. Required for Neuroscience majors in the Integrative/Cognitive track. Allows students to develop a working knowledge of neural networks and brain systems and the techniques used to study these functions. Includes an introductory overview of neuroanatomy, physiology, and behavior, and then moves on to the sensory and motor systems, motivation, and learning and memory. FALL. [4] Casagrande/Deutch.

345. Cellular and Molecular Neuroscience. (Also listed as Cell and Developmental Biology 345, Molecular Physiology and Biophysics 345, Pharmacology 345) Required entry-level course for the Ph.D. in neuroscience and an elective for medical students. Students are exposed to fundamental concepts and techniques in molecular and cellular neuroscience and provided with a theoretical context for experimental analysis of brain function. The course is divided into four modules. *Module I: Biophysics and Biochemistry of Synaptic Transmission* reviews biophysical and molecular concepts relating to membrane excitability, action potential generation and propagation, and the molecular basis of chemical signaling at synapses. *Module II: Synaptic Integration and Plasticity* discusses mechanisms and models of synaptic integration and plasticity and concentrates on how molecular changes translate into altered synaptic strength and gene expression programs that underlie short and long-term plasticity. *Module III: Neural Development* examines historical and current concepts in neural pattern formation, neural migration, axon guidance and synapse formation. *Module IV: Neural Diseases*

and Disease Models focuses on specific brain disorders such as epilepsy, depression, schizophrenia, and Alzheimer's disease and current models used to investigate their origin and/or treatment. This course combines faculty lecture with discussion of original articles, with an emphasis on student participation. SPRING. [4] Blakely, Carter, and Staff.

346. Advanced Molecular Neurobiology. (Also listed as Pharmacology 346) This course examines molecular components and interactions that regulate neuronal development, signaling, and disease. Topics include development of neuronal identity, axonal transport, growth factors and cell death, axon guidance and synapse formation, electrical and chemical transmission, regulation of neuronal excitability and genetic analysis of signaling and neural disorders. Didactic and literature discussions provide students with a sound foundation for understanding the molecular bases underlying the development and function of the nervous system. Prerequisite: 345, Pharmacology 324–325, or consent of instructor. SPRING. [3] Emeson and Staff.

347. The Visual System. (Also listed as Cell and Developmental Biology 347, Psychology 336, Electrical Engineering 351) An interdisciplinary approach to how humans see and interpret their visual environment. Topics include the structure of the eye and brain (including optics), the physiology of individual cells and groups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual perception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week in addition to lecture, and turn in a more extensive paper than undergraduates. SPRING. [3] Lappin, Casagrande, Bonds (Electrical Engineering).

348. Contemporary Issues in Behavioral Neuroscience. (Also listed as Pharmacology 348) This course explores recent findings in neuroethology and behavioral neurobiology through presentation and discussion of current research. Topics may include: animal communication; prey capture and orientation; circadian rhythms, sensory systems; neural control of hunger and thirst; hormones and sexual behavior; emotion, reward, and addiction; synaptic plasticity, learning, and memory; and disorders of the nervous system. Methods used to link brain structure and function will be explored. SPRING. [2] McDonald.

350. Independent Study. Qualified students work with individual faculty members in areas not covered in available courses. Prerequisite: approval by individual faculty member and program director. FALL, SPRING, SUMMER. [Variable credit: 1–3, with total credit limited to 3]

355. Integrative Neuroscience. Structure and function of nervous systems. Emphasis on vertebrate brain and the relationship of anatomy, physiology, and biochemistry to sensory perception, cognition, motor activity, and learning and memory. Prerequisite: 201. SPRING. [3] Norden.

366. Molecular Basis of Neural Disease. This advanced course covers current concepts and models for brain and peripheral neural diseases, including genetic and environmentally based disorders. The course will combine didactic and research presentations to review the identification and characterization of defective or misexpressed molecules that increase risk or lead directly to neural diseases. Topics to be covered include simple and complex trait disorders, trinucleotide repeat syndromes, disorders of myelination, movement disorders, dementia and Alzheimer's disease, and pain. This course is offered as a module in the second half of the spring semester. Prerequisite: 345 or consent of instructor. SPRING. [2] Staff.

376. Neurogenetics. This advanced course covers Mendelian genetics including relationships between mutational mechanisms and inheritance patterns. Topics highlighting genetics of neurological phenotypes will be discussed. Prerequisite: 345 or consent of instructor. SPRING. [2] Sutcliffe.

399. Ph.D. Dissertation Research.

Nursing Science

DEAN Colleen Conway-Welch
PROFESSORS Peter I. Buerhaus, Colleen Conway-Welch, Mary Jo Gilmer, Jeffry S. Gordon, Lynda L. LaMontagne, Larry E. Lancaster, Ann F. Minnick, Linda D. Norman, James Pace, Bonnie A. Pilon, Randolph F. R. Rasch, Vaughn G. Sinclair, Patricia A. Trangenstein, Kenneth A. Wallston, Elizabeth E. Weiner
ASSOCIATE PROFESSORS Kathleen A. Dwyer, Joan E. King, Melanie Lutenbacher (Director)
RESEARCH ASSOCIATE PROFESSORS Mary S. Dietrich, Nancy Wells
ASSISTANT PROFESSORS Thomas H. Cook, Karen C. D'Apolito, Sarah C. Fogel, Rolanda L. Johnson, Sheila H. Ridner, Michele H. Salisbury, Cathy R. Taylor, Michael W. Vollman

DEGREE OFFERED: *Doctor of Philosophy*

❧ THIS program prepares scholars for research and teaching careers in major universities and for research positions in public or private sectors of health care. Two tracks of study are available: Clinical Research and Health Services Research. These areas of study are reflective of the overall research interests and expertise of School of Nursing faculty members and the resources available in the medical center, the university, the School of Nursing nurse-managed and interdisciplinary care delivery centers, and the Veterans Affairs Tennessee Valley Healthcare System (Nashville campus). More specifically, faculty research interests include such areas as stress and coping, perceived control, health promotion, clinical outcomes, oncology, pediatric palliative care, impact of chronic conditions on individuals and families, family violence, health psychology/behavioral medicine, life transitions, and symptom management.

Admission to the Ph.D. in Nursing Science program is through the Graduate School, which oversees all doctoral programs in the university. Application materials are online and may also be obtained from the Graduate School located in Kirkland Hall. Successful applicants to the program are those whose previous academic performance, letters of recommendation, Graduate Record Examination scores, and written goal statement meet admission standards for the School of Nursing and the Graduate School and whose research and career goals best match the school's research foci and faculty expertise.

The program requires 72 credit hours of study, of which 18 may be transferred from master's course work, pending review and approval by the graduate faculty. The two-year core curriculum of the program includes 26 credit hours of required course work for all Ph.D. students, 17 credit hours of required course work specific to the selected track of study, and 11 credit hours of course work that supports the student's focus of research. Students work with faculty mentors who guide and oversee their educational program from admission through completion of degree requirements. They participate in intensive research experiences connected with faculty research projects and are exposed to a variety of research designs and

analysis techniques. Requirements for the degree include successful completion of advanced course work, a qualifying paper, oral qualifying exam, and dissertation (including oral defense of proposal and findings). Full-time and part-time options are available.

Further information about the doctoral program can be obtained by writing Ph.D. Program, Office of Admissions, Godchaux Hall, 461 21st Avenue South, Nashville, Tennessee 37240, calling (615) 322-3800, or visiting the Web site at *www.mc.vanderbilt.edu/nursing/phd/admission.html*.

300. Developing a Program of Research I. This is the first of two seminar courses that provide foundational information necessary for developing a program of research. Focus is placed upon acquiring practical skills necessary to develop a program of research, narrowing the focus of student's area of research, and developing the related plan of graduate studies and experiences. Prerequisite: consent of faculty. [1]

301. Developing a Program of Research II. The second seminar in this series provides additional foundational information necessary for developing a program of research. Focus is upon developing the knowledge and practical skills necessary to investigate an area of research interest and to draft a research proposal appropriate to the student's current level of career development needs and/or phenomenon of interest. Prerequisite: NRSC 300. [1]

305. Informatics and Scholarly Inquiry. This course provides an overview of informatics, the transformation of data into information, knowledge, decisions, and actions to improve outcomes. To take advantage of electronic data mines, scholars of the future will need to understand the basics of databases and the structure of vocabularies. Knowledge management to support evidence-based practice will be a critical skill. In addition, this course prepares the student to use available technology tools to present, interpret, and organize data. Prerequisite: consent of faculty. [2]

310. Health, Healthcare, Research, and Public Policy. This course explores and critically analyzes theoretical and empirical approaches to understanding the dynamic synergies among research, nursing practice, healthcare organization, and public policy and their impact on health. Strategies for dissemination, translation, and evaluation of evidence-based research findings that support healthcare practices and public policies in order to measurably improve health outcomes for selected populations will be discussed. Local, national, and global implications will be explored. Prerequisite: consent of faculty. [2]

320. Statistics for Health Sciences. This course provides an overview of the logic and appropriate use of statistical techniques most commonly reported in the research literature of the health professions. The spectrum of topics encompasses most univariate parametric and nonparametric procedures, including correlational and repeated measures analyses. Across the varied topics, emphasis is placed on: 1) becoming knowledgeable of the underlying logic of each statistical technique, 2) the appropriate use and underlying assumptions of the procedure, 3) interpretation of results from statistical software, and 4) evaluation of published results using the procedure. Upon conclusion of the course, students will have a solid foundation for understanding and using more advanced multivariate and longitudinal statistical analysis procedures. Prerequisite: consent of faculty. [3]

342. Theory Development in Nursing. This course provides the basics for examination and critical analysis of the structural components and processes used for theory development in nursing. Concepts and theories from philosophy of science and methods of theory development are used to examine the nature of theory, theory development as a process, theory development in nursing, and the organization of knowledge for nursing. The process

of theory analysis is examined as the foundational step in formulating potential research questions and design theory–based nursing practice. Prerequisite: consent of faculty. [3]

350. Conceptual Foundations for Clinical Research. This course is designed to provide critical analysis of theories, concepts, and research related to the promotion, protection, and restoration of health across the lifespan at individual, family, and community levels. Emphasis will be on the individual level. Students conduct a critical analysis of existing and emerging scientific knowledge in a chosen field of study Prerequisite: consent of faculty. [3]

352. Measurement in Clinical Research. This course examines the principles of measurement, procedures used for critical evaluation of clinical measures and specific techniques for assessing validity, reliability, and the structure of measures for use in diverse populations. A variety of behavioral and physiologic measures are included. Development of new, as well as modification of existing, instruments are included. Prerequisite: consent of faculty. [3]

366. Curriculum Strategies for Health Professional Education. This course introduces foundations of learning theory and learning styles. The impact of technology on learning practices and the appropriate use of technology to facilitate learning is emphasized. Students will create electronic elements for effective learning and use a course management system. Copyright and fair use issues are discussed. Overall curriculum strategies that integrate content, organization, informatics, and sequencing of courses are discussed. Students will design a learning program that integrates learning styles, technology use, and a course management system. Prerequisite: consent of faculty. [3]

367. Educational Evaluation for Learning in the Health Professions. This course explores issues related to evaluating educational offerings that employ technology. The advantages and disadvantages of both traditional and more novel approaches to evaluation are discussed. Students will learn how to create online surveys along with principles of test and survey management. Issues surrounding online testing including access, privacy, and data input accuracy are emphasized. Overall program benchmarks are explored. Prerequisite: consent of faculty. [3]

368. Contextual Nature of Health and Health Behaviors. This course explores theoretical and empirical approaches to understanding the interaction of health and environment in affecting health, examining contextual factors that impact health and health behaviors of various system levels. Examines disparity (e.g., social and economic) as a determinant of health among individuals and sub-populations. Critique selected models of health, health behavior, community organization, and health care delivery and their usefulness in order to understand the impact on selected health phenomena and various ethno-cultural populations and communities. Students critically analyze and synthesize the literature related to a selected phenomenon of interest. Prerequisite: consent of faculty. [2]

380. Knowledge Synthesis in Nursing. This course provides critical appraisal of the theoretical and empirical basis of nursing science. Theories and research generated to study phenomena related to nursing are evaluated and synthesized. Strategies for synthesizing extant knowledge in nursing are discussed. Prerequisite: consent of faculty. [3]

381. Current Topics in Health Services Research. This course is designed to assist the student to develop expertise concerning the objectives, support mechanisms, limitations, and controversies of current HSR research initiatives and HSR organizations. Examples of initiatives include (but are not limited to) those of the IOM, governmental and private safety studies, QI/QA consortia, JCAHO, IHI, and other projects. The student will be expected to assess the relative place of her/his research interest in the current HSR environment and to begin to function within the professional role of a health services researcher. Prerequisite: consent of faculty. [3]

382. Measuring Outcomes: Issues in Health Services Research Designs. In this course, the student will develop exper tise in the design, measur ement, and analysis of studies employing the five generic outcomes of gr eatest interest in outcomes studies: satisfaction, cost-effectiveness, mortality, health-related quality of life, and morbidity . The student will also be expected to develop an overview including measur ement and analysis plans for a condition-specific outcome. The impact of the researcher's decisions regarding conceptual models, treatment definition, risk adjustment strategies, and the application of statistical techniques will be explored. At least one contr oversy attendant to each of the five generic outcomes will be debated in class. Pr erequisite: completion of at least one doctoral-level statistics course and NRSC 393. [3]

390. Independent Study in Nursing Science. Individualized study and r eading in ar eas of mutual interest to the student and faculty member Prerequisite: consent of instructor. [Variable credit: 1–3]

393. Quantitative Research Methods. This course provides an in-depth analysis of quantitative research methods employed in health-related research and focuses on topics such as formulation of r esearch questions and hypotheses, integration of conceptual and theor etical frameworks, experimental and non-experimental designs, intr oduction to measurement theory, sampling and sampling size estimation, and data analysis plans. Students will also critique quantitative research reports and proposals. Prerequisite: consent of faculty. [3]

394. Qualitative/Field Research Methods. This course explores qualitative approaches to research, including their theor etical foundations and practical applications. A variety of qualitative methods are presented and discussed. Class par ticipants have the opportunity to study one or two selected methods in-depth. Prerequisite: consent of faculty. [3]

395. Research Practicum. This course pr ovides students with exposur e to and involvement in the r esearch process. Learning activities ar e based on student need and inter est and determined according to best fit with available faculty r esearch programs. Prerequisite: consent of faculty. [Variable credit: 1–2]

399. Ph.D. Dissertation Research. [Variable credit: 0–6]

Pathology

See Cellular and Molecular Pathology

Pharmacology

CHAIR Heidi E. Hamm
VICE CHAIR Joey V. Barnett
DIRECTOR OF GRADUATE STUDIES Joey V. Barnett
PROFESSORS EMERITI Lawrence Berman, Wolf D. Dettbarn, Joel G. Hardman, Jack N. Wells, Grant R. Wilkinson
PROFESSORS Michael Aschner, Malcolm Avison, Jeffrey Balser, Italo Biaggioni, Randy D. Blakely, Alan R. Brash, Kendal S. Broadie, Nancy J. Brown, Richard Caprioli, Jeffrey Conn, Louis J. DeFelice, Ariel Y. Deutch, Sudhansuk Dey, John H. Exton, Alfred George Jr., Heidi E. Hamm, Kenneth R. Hande, Richard Kim, Pat Levitt, Daniel Liebler, MacRae Linton, Terry Lybrand, Robert Macdonald, Lawrence J. Marnett, Peter R. Martin, Richard McCarty, Herbert Y. Meltzer, Jason D. Morrow, Gregory R. Mundy, John A. Oates, L. Jackson Roberts II, David Robertson, Dan M. Roden, Jeffrey Rottman, Elaine Sanders-Bush, Richard Shelton, Kevin Strange, Douglas E. Vaughan, Ronald G. Wiley, Alastair J. J. Wood
RESEARCH PROFESSOR David Hachey
ADJUNCT PROFESSORS John T. Clark, Lee E. Limbird, Sukhbir Mokha
ASSOCIATE PROFESSORS EMERITI Erwin J. Landon, Peter W. Reed
ASSOCIATE PROFESSORS Joseph A. Awad, Joey V. Barnett, Richard M. Breyer, H. Alex Brown, Ronald B. Emeson, Igor Feoktistov, Vsevolod Gurevich, William A. Hewlett, Bjorn Knollmann, Craig Lindsley, Michael J. McLean, John J. Murray, Katherine T. Murray, Sandra Rosenthal, Bih-Hwa Shieh, C. Michael Stein, Brian E. Wadzinski
RESEARCH ASSOCIATE PROFESSOR C. David Weaver
ASSISTANT PROFESSORS Christopher B. Brown, Chang Chung, Kevin Currie, Jerod Denton, Anthony C. Forster, Eugenia Gurevich, Eva M. Harth, Richard Ho, Tina M. Iverson, Sabina Kupershmidt, Gregory C. Mathews, Michael McDonald, BethAnn McLaughlin, Jens Meiler, Paul Moore, Richard Nass, Satish Raj, Benjamin Spiller, Edwin Weeber, Tao Peter Zhong
RESEARCH ASSISTANT PROFESSORS David Airey, Olivier Boutaud, Lucia Carvelli, Songhai Chen, Sean Davies, Kathi Eagleson, Maureen Hahn, Xia Li, Stephen Milne, Colleen M. Niswender, Aurea Pimenta, Anita Preininger, Christine Saunders, Claus Schneider, Gregg Stanwood, Uhna Sung, Rommel G. Tirona, Dao-Wu Wang, Zixiu Xiang, Huiyong Yin, Chong-Bin Zhu
ADJUNCT ASSISTANT PROFESSORS Sanika Chirwa, Habibeh Khoshbouei
INSTRUCTORS L. Keith Henry, Dawn Matthies, Harish Prasad
RESEARCH INSTRUCTORS Paul J. Gresch, Haifa Hallaq, John Mason, Sergey Vishnivetsky, Hong-Guang Xie, Ping Yang, Zhen Jiang Yang

DEGREE OFFERED: *Doctor of Philosophy*

STUDENTS interested in pharmacology participate in the Interdisciplinary Graduate Program in the Biomedical Sciences (see Biomedical Sciences). The program of study provides a broad background in pharmacology and other biomedical disciplines, preparing the student for a career as a research investigator. Graduates have been highly successful in obtaining positions in medical schools, government research institutes, and the pharmaceutical industry.

Students in their first year complete a core of course work through the Interdisciplinary Graduate Program in the Biomedical Sciences. The second year of study is composed of required and elective courses in Pharmacology for a total of 33 hours of formal course work toward the Ph.D. degree (including the 16 hours in the first year IGP). Requirements vary regarding the amount and distribution of course work that must be taken in related fields, but substantial work is usually taken in such other areas as cell biology, biochemistry, molecular physiology, biophysics, and chemistry. Subsequent years focus upon research and specialized course work as directed by mentors in the Pharmacological Sciences Training Program. Fields of research include molecular and biochemical pharmacology; neuropharmacology; autonomic, cardiovascular, endocrine, and clinical pharmacology; and drug metabolism and toxicology. A research dissertation is required for the Ph.D. degree. A thesis-based master's degree is awarded only under special circumstances.

For more information, visit *http://pharmacology.mc.vanderbilt.edu*.

320. Pharmacological Targets and Mechanisms. Introduction to *in vivo* physiological mechanisms, anatomical structure of organ systems, and regulatory feedback pathways responsible for drug metabolism and physiological homeostasis. Classical studies that shifted the paradigm in a particular area and contemporary research will be discussed to demonstrate clarity of thinking, focused experimental strategies leading to genuine discovery, as well as potential difficulties in interpretation of results of experiments. Modular format allows for variable credit; see instructor. FALL. [1–3] Brash.

321. Principles of Drug Action. The mechanisms of drug action are taken up in a systematic manner. Course includes didactic lectures and parallel guided readings on drug discovery and design, based on current advances in basic science and clinical research. Modular format allows for variable credit; see instructor. SPRING. [1–4] Barnett.

322. Scientific Communication Skills. Techniques in effective oral communication of scientific research as well as practical experience in research and literature presentation and in the preparation of grant proposals. FALL. [1] Chung.

323. Excitable Membrane Properties in Nerve and Muscle. (Also listed as Molecular Physiology and Biophysics 323 and Neuroscience 324) Recent findings concerning the structure, function, and pharmacology of ion channels. Topics will include the relationship between amino acid sequence, protein subunit structure, and function of both voltage- and ligand-gated channels; the relationship between channel structure and pharmacology; the interaction of drugs with channels and receptor/channel proteins, with special emphasis on the interaction of compounds with different functional channel states; indirect coupling between ion channels and neurotransmitter and hormone receptors. Classes will include both presentations by the instructors and discussion of recent publications by students. Prerequisite: consent of instructor. SPRING. [3] DeFelice.

324. Receptor Theory and Signal Transduction. Structure and function of cell-surface receptors and the molecular bases by which they activate cellular function. Topics include receptor identification; quantitation of simple and complex binding phenomena; molecular bases for receptor coupling to GTP-binding proteins; the structure and function of ligand-operated ion channels, receptor-tyrosine kinases and receptor-induced signal transduction cascades receptors as oncogenes and proto-oncogenes. SUMMER. [3] A. Brown.

325. Cardiovascular Pharmacology. Cardiovascular physiology and pharmacology from the molecular to the organismal level. Classic experimental studies, molecular studies, and clinical

observations will be pr esented to demonstrate the power of inter disciplinary approaches in answering complex questions in biology. Students will have the opportunity to identify specific areas or pathophysiologic states for emphasis. T opics covered: development of the car diovascular system, regulation of cardiac contractility and electrophysiology, blood pressure regulation, coagulation, and select car diovascular pathophysiologies. SPRING of ODD YEARS ONLY. [2] Barnett.

329. Pharmacology of Psychotr opic Drugs and Drug Abuse. (Also listed as Neuroscience 329) An advanced course that focuses on the mechanism of action of CNS-active drugs, with extensive literature reading and student presentations. Prerequisite: 320, 345, or consent of instructor. SPRING. [2] Sanders-Bush.

345. Cellular and Molecular Neuroscience. (Also listed as Cell and Developmental Biology 345, Molecular Physiology and Biophysics 345, Neuroscience 345) Students are exposed to fundamental concepts and techniques in molecular and cellular neuroscience and provided with a theoretical context for experimental analysis of brain function. The course is divided into four modules. *Module I: Biophysics and Biochemistry of Synaptic Transmission* reviews biophysical and molecular concepts relating to membrane excitability, action potential generation and propagation, and the molecular basis of chemical signaling at synapses. *Module II: Synaptic Integration and Plasticity* discusses mechanisms and models of synaptic integration and plasticity and concentrates on how molecular changes translate into alter ed synaptic strength and gene expression programs that underlie short and long-term plasticity. *Module III: Neural Development* examines historical and curr ent concepts in neural patter n formation, neural migration, axon guidance and synapse for mation. *Module IV: Neural Diseases and Disease Models* focuses on specific brain disor ders such as epilepsy, depression, schizophrenia, and Alzheimer's disease and curr ent models used to investigate their origin and/or treatment. This course combines faculty lecture with discussion of original articles, with an emphasis on student participation. SPRING. [4] Blakely, Carter, and Staff.

346. Molecular Neur obiology. (Also listed as Neur oscience 346) This course examines molecular components and interactions that regulate neuronal development, signaling, and disease. Topics include development of neur onal identity, axonal transport, growth factors and cell death, axon guidance and synapse for mation, electrical and chemical transmission, regulation of neuronal excitability and genetic analysis of signaling and neural disorders. The course featur es didactic and literatur e discussions to intr oduce and cover key molecular mechanisms. Pr erequisite: 345, Phar macology 320, under graduate course in neurobiology, or consent of instructor. SPRING. [3] Emeson, Staff.

348. Contemporary Issues in Behavioral Neur oscience. (Also listed as Neur oscience 348) This course explor es recent findings in neur oethology and behavioral neur obiology through presentation and discussion of current research. Topics may include: animal communication; prey capture and orientation; circadian rhythms; sensory systems; neural control of hunger and thirst; hor mones and sexual behavior; emotion, r eward, and addiction; synaptic plasticity, learning, and memory; and disor ders of the nervous system. Methods used to link brain structure and function will be explor ed. SPRING. [2] McDonald.

350. Independent Study. Qualified students work with individual staf f members in areas not covered in other available courses. Pr erequisite: approval of staff member and depar tment chair. FALL, SPRING, SUMMER. [Variable credit: 1–2, with total credit limited to 2 hours] Staff.

360. Current Issues in Pharmacology. Presentation of current advances, paradigm shifts, and problems in phar macology with an emphasis on experimental appr oaches and their interpretation. Prerequisite: consent of instructor. SPRING. [Variable credit: 1–3] Staff.

399. Ph.D. Dissertation Research.

Philosophy

CHAIR Michael P. Hodges
DIRECTOR OF GRADUATE STUDIES Gregg M. Horowitz
PROFESSORS EMERITI John J. Compton, Clement Dore, Robert R. Ehman, John F. Post, Donald W. Sherburne
PROFESSORS Lenn E. Goodman, Michael P. Hodges, John Lachs, Kelly Oliver, Lucius T. Outlaw Jr., Charles E. Scott, John J. Stuhr, Henry A. Teloh, David Wood
ASSOCIATE PROFESSORS Idit Dobbs-Weinstein, Gregg M. Horowitz, José Medina, Robert Talisse, Jeffrey S. Tlumak
ASSISTANT PROFESSORS Mark J. Bliton, Stuart G. Finder, Jonathan Neufeld
SENIOR LECTURERS Kevin Davis, Russell McIntire, Susan Schoenbohm

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

❧ EACH candidate for the master's degree must complete 24 hours of formal course work with a minor of at least 6 hours. The minor may include courses from philosophy and other disciplines, and it must form a coherent whole. The master's degree usually requires submission of a thesis, but an optional non-thesis plan is available to students admitted to candidacy for the Ph.D.

Work for the Ph.D. degree is offered in the fields of aesthetics, epistemology, ethics, history of philosophy, continental philosophy, American philosophy, metaphysics, philosophy of mind, philosophy of religion, philosophy of science, and political and social philosophy. Candidates must complete at least 47 hours of formal course work, including a minor of at least 12 hours. This work may include courses from philosophy and other disciplines, and it must form a coherent whole.

Ability to use the philosophical literature in languages other than English is an important scholarly tool. Students are encouraged to read foreign language materials, and faculty members are encouraged to recommend them, during the regular program of course and seminar work. The language requirement is satisfied when a student completes an independent readings course (Philosophy 302, 303, 304) using materials in one foreign language, usually French, German, or Greek, or by making significant use of a foreign language in conjunction with a regular course offering. The department has special expertise in Arabic, Hebrew, and Latin, as well.

202. Formal Logic and Its Applications. 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 102 is not required. FALL. [3] Talisse.

210. Ancient Philosophy. An examination of the major Greek and Roman philosophers with emphasis on the works of Plato and Aristotle. FALL. [3] Staff.

211. Medieval Philosophy. 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. SPRING. [3] Goodman and Dobbs-Weinstein.

212. Modern Philosophy. An examination of the major philosophers of modern Europe from Descartes and Spinoza through Locke, Berkeley, Hume, and Kant. SPRING. [3] Staff.

213. Contemporary Philosophy. 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] (Not currently offered)

217. Metaphysics. Selected problems in metaphysics such as ultimate explanation, meaning of existence, time and eternity, freedom and determinism, and science and religion. [3] (Not currently offered)

218. Hellenistic and Late Ancient Philosophy. Philosophical ideas of Stoics, Cynics, Epicureans, skeptics, Peripatetics, Neoplatonists, and early monotheist thinkers such as Philo, Origen, and Philoponus. [3] (Not currently offered)

220. Immanuel Kant. 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] Lachs. (Not currently offered)

222. American Philosophy. A study of the works of selected American philosophers from the colonial period to the present. FALL. [3] Stuhr.

224. Existential Philosophy. A study of two or three existential philosophers and selected problems which arise in relation to their thought. [3] Medina. (Not currently offered)

226. Phenomenology. 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] Staff. (Not currently offered)

228. Nineteenth-Century Philosophy. A study of selected themes and writings from nineteenth-century European philosophers. [3] Staff. (Not currently offered)

231. Philosophy of History. Focus on alternative conceptions of time and history in Aristotle, Augustine, Kant, Hegel, Heidegger, and Benjamin. [3] Staff. (Not currently offered)

234. Philosophy of Education. Analysis of educational concepts. Educational implications of theories of knowledge and theories of the individual. Emphasis on higher education. FALL. [3] Hodges.

235. Gender and Sexuality. Recent theories of the relation between sex, gender, and sexuality. Construction of gendered identities, and their relation to embodiment, gender politics, ethics, and epistemology. FALL. [3] Staff.

238. Contemporary Ethical Theory. A study of theories about the cognitive foundations of ethical discourses. Prerequisite: 105. [3] Staff. (Not currently offered)

239. Moral Problems. 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. Prerequisite: 105. [3] Staff. (Not currently offered)

240. History of Aesthetics. History of philosophy of art, aesthetic experience, creativity, criticism, and related concepts. FALL. [3] Neufeld.

241. Modernist Aesthetics. Abstraction, non-traditional media, mixed media, new media, changes in artistic institutions, and the death of art. SPRING. [3] Horowitz.

242. Philosophy of Religion. A study of various problems concerning religious experiences; ideas about religion and divinity. FALL. [3] Staff.

243. Philosophy of Film. 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] (Not currently offered)

244. Philosophy and the Natural Sciences. Philosophical issues in the methodology, conceptual structure, patterns of explanation, historical development, cultural impact, and metaphysical and ethical implications of the natural sciences. Prerequisite: satisfaction of the basic science requirement. SPRING. [3] Medina.

245. Humanity, Evolution, and God. 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] Goodman. (Not currently offered)

246. Philosophy of Language. 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. FALL. [3] Medina.

247. Kierkegaard and Nietzsche. A study of selected works. [3] (Not currently offered)

248. Philosophy and Literature. Philosophical topics in novels or poetry. Examples include: meaning of life, linguistic meaning, good and evil, aesthetic value, and human freedom. SPRING. [3] Teloh.

249. Philosophy of Music. Music and meaning, language, emotion, expression, interpretation, performance, the body, and politics. No musical background is required. FALL. [3] Neufeld.

251. Topics in Aesthetics. Philosophy of art and aesthetic theory. [3] Horowitz, Neufeld. (Not currently offered)

252. Political and Social Philosophy. A study of selected social and political theories. Critical analysis of the relevant works of Hegel, Marx, Lenin, Mill, Nietzsche, Gentile, and others. FALL. [3] Teloh.

253. Philosophy and Economic Policies. A study of individual freedom, property rights, and welfare in their implications for a free market, private ownership of means of production, taxation, and expenditure for public goods. Readings from selected philosophers and economists—e.g., Locke, Hegel, Rawls, Nozick, Marx, Hayek, Friedman, Galbraith. [3] Staff. (Not currently offered)

254. Modern Philosophies of Law. 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. SPRING. [3] Davis.

256. Philosophy of Mind. Selected problems in the philosophy of mind; relationship 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. SPRING. [3] Staff.

257. Early Modern Political Philosophy. [3] Dobbs-Weinstein. (Not currently offered)

258. Contemporary Political Philosophy. The emergence of post-liberal political thought. Topics include the politics of recognition, the specificity of political action, transformations in political theory as a consequence of gender, race, and environmental issues. These will be studied through examination of the writings of Hannah Arendt, Cornelius Casoriadis, Heidegger, Derrida, Habermas, etc. [3] Staff. (Not currently offered)

260. Twentieth-Century Continental Philosophy. A study of selected twentieth-century philosophers such as Derrida, Foucault, and Lacan. SPRING. [3] Wood.

261. Jewish Philosophy. Introduction to Jewish philosophy and the philosophical achievement of such major figures as Philo, Saadiah, Maimonides, Levinas, and selected contemporary thinkers. Goodman. (Not currently offered)

262. Islamic Philosophy. Introduction to the major figures of Islamic philosophy including Kindi, Razi, Farabi, Avicenna, and Ibn Khaldun. [3] Goodman. (Not currently offered)

263. French Feminism. Introduction to the tradition of French feminist philosophy, including relevant works by Beauvoir, Cixous, Irigaray, Kristeva, LeDoeuff, Kofmann, and others. [3] Staff. (Not currently offered)

270. Ethics and Medicine. Selected ethical issues raised by clinical practice, medical theories, and biomedical research and technology. Prerequisite: 105. SPRING. [3] Bliton.

271. Ethics and Business. 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: 105. [3] Lachs. (Not currently offered)

272. Ethics and Law. 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. Prerequisite: 105. SPRING. [3] Davis.

294a–294b. Selected Topics. Topics of special interest, as announced in the *Schedule of Courses*. Students may enroll in more than one section per semester. FALL, SPRING. McGill Seminar, SPRING. [Credit: 3 each seminar, not to exceed 12 over a four-semester period] Staff.

301. Teaching and Research Methods. Survey of methods of research in philosophy and examination and discussion of teaching methods. Required of all first-year graduate students. FALL. [2] Staff.

302. Philosophical Readings in French. Selected major philosophical works or a selected bibliography about a major philosophical problem, read in French. A translation examination and appropriate reports. Completion with a *B* or better satisfies the department's language requirement. Prerequisite: four college semesters of French or equivalent; or a 550 or better score on the GSFLT in French. FALL, SPRING. [3] Staff.

303. Philosophical Readings in German. Selected major philosophical works or a selected bibliography on a major philosophical problem. A translation examination and appropriate reports. Completion of this course with a grade of *B* or better satisfies the department's language requirement. Prerequisite: four college semesters of German or equivalent; or a 550 or better score on the GSFLT in German. FALL, SPRING. [3] Staff.

304. Philosophical Readings in Classical Languages (Latin or Greek). The reading in Latin or Greek of selected major philosophical works or a selected bibliography on a major philosophical problem. A translation examination and appropriate reports. Completion of this course with the grade *B* or better satisfies the department's language requirement. Prerequisite: four college semesters of the appropriate language or equivalent. FALL, SPRING. [3] Staff.

350. Readings in Philosophy. Selected major philosophical works or a selected bibliography about a major philosophical problem. Appropriate reports and examination. FALL. [3] Staff.

351. History of Philosophy. Survey of figures and/or topics in history of philosophy. Appropriate reports and examination. FALL, SPRING. [3] Staff.

352. Topics in Philosophy. Survey of topics in philosophy. FALL, SPRING. [3] Staff.

353. Figures in Philosophy. Survey of figures in the history of philosophy. FALL, SPRING. [3] Staff.

361. Ancient Philosophy. Survey of major figures and topics in ancient philosophy. FALL, SPRING. [3] Staff.

362. Medieval Philosophy. Survey of figures and/or topics in medieval philosophy. FALL. [3] Staff.

363. Modern Philosophy. Survey of figures and/or topics in moder n philosophy. FALL, SPRING. [3] Staff.

364. Nineteenth-Century Philosophy. FALL, SPRING. [3] Staff.

365. Twentieth-Century Philosophy. Survey of figures and/or topics in twentieth-centur y philosophy. FALL, SPRING. [3] Staff.

369. Master's Thesis Research. [0]

399. Ph.D. Dissertation Research.

Physics and Astronomy

CHAIR Robert J. Scherrer
DIRECTOR OF GRADUATE STUDIES Senta V. Greene
PROFESSORS EMERITI John Paul Barach, Douglas S. Hall, Arnold M. Heiser, E. A. Jones, P. Galen Lenhert, C. E. Roos, Medford S. Webster
PROFESSORS Royal G. Albridge, Charles A. Brau, Frank E. Carroll Jr., Walter J. Chazin, Charles W. Coffey, Louis J. DeFelice, David J. Ernst, Leonard C. Feldman, Daniel M. Fleetwood, John C. Gore, Senta V. Greene, Richard F. Haglund Jr., Dennis G. Hall, Joseph H. Hamilton, Charles F. Maguire, Volker E. Oberacker, Sokrates Pantelides, James A. Patton, David W. Piston, Ronald R. Price, Akunuri V. Ramayya, Robert J. Scherrer, Paul D. Sheldon, Norman H. Tolk, A. Sait Umar, Thomas J. Weiler, David A. Weintraub, Robert A. Weller, John P. Wikswo Jr.
DISTINGUISHED RESEARCH PROFESSOR C. Robert O'Dell
RESEARCH PROFESSORS Aaron B. Brill, C. Richard Chappell, Sergey Rashkeev, Medford S. Webster
ASSOCIATE PROFESSORS Steven E. Csorna, Tobias Hertel, Will E. Johns, Thomas W. Kephart, Sandra J. Rosenthal
RESEARCH ASSOCIATE PROFESSORS Anthony B. Hmelo, Marcus H. Mendenhall
ASSISTANT PROFESSORS Franz Baudenbacher, James Dickerson, Dennis Michael Duggan, Daniel F. Gochberg, M. Shane Hutson, Robert Knop, Michael G. Stabin, Keivan G. Stassun, Julia Velkovska, Kalman Varga
RESEARCH ASSISTANT PROFESSORS Heather Andrews, Iskander Batyrev, Leonard Alan Bradshaw, Bibo Feng, William E. Gabella, Juan-Carlos Idrobo, David James, Yu Pei Ma, Alan Tackett, Leonidas Tsetseris, Eric Vaandering, Momchil Velkovsky, Sanwu Wang

DEGREES OFFERED:

PHYSICS. *Master of Arts, Master of Science, Doctor of Philosophy*
ASTRONOMY. *Master of Science*

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 role, the Department of Physics and Astronomy has active research groups studying the physics of elementary particles; nuclear structure and heavy-ion reactions; the behavior of electrons, atoms, molecules, and photons in the two-dimensional world near surfaces; nonlinear optical physics of nanocrystals, surfaces, and interfaces; the electric and magnetic properties of living systems; the structure and dynamics of biopolymers; computational physics; unusual, low-mass and young stars, extrasolar planets, and star clusters; and cosmology.

The master's degree in physics requires a minimum of 24 credit hours of formal course work, of which at least 9 must be in course work above the 300 level. Students in the physics master's program usually submit a thesis; however, a non-thesis option is available to students admitted to candidacy for the Ph.D. in physics. Under the non-thesis plan, the student presents an oral report on a research subject in the field of investigation and submits a written account of this subject to the program faculty. A master's degree in physics with emphasis in health physics is also available. For information regarding the master of science degree in medical physics, see the medical physics section in the medical school catalog.

The Ph.D. degree requires at least 72 hours of graduate work, including 18 hours of core courses, the 1 hour Physics 300 seminar, 12 hours of non-core physics graduate courses, and 5 hours of elective courses. The remaining credit hours may be earned through some combination of dissertation research and approved lecture courses.

The master's degree in astronomy requires a minimum of 24 credit hours, of which 12 are to be chosen from the astronomy course offerings. The master's program in astronomy normally requires four semesters and includes an oral examination.

Physics

210. Introduction to Electronics. (Also listed as Electrical Engineering and Computer Science 200, Elements of Electrical Engineering) An introduction to passive and active circuits. Direct-current and alternating-current circuits, power supplies, amplifiers, oscillators, wave-shaping, and switching circuits. Emphasis on the operational characteristics of these circuits. Prerequisite: Math 175. SPRING. [3] Staff of the Department of Electrical Engineering and Computer Science.

221. Classical and Moder n Optics. Geometrical optics: reflection, refraction, ray tracing, aberrations, interference. Physical optics: wave theory, absorption, dispersion, diffraction, polarization. Properties of light from lasers and synchrotron sources; photodetectors; optical technology. No credit for graduate students in physics. SPRING. [3] Dickerson.

223. Thermal and Statistical Physics. 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. FALL. [3] Tolk.

225a–225b. Introduction to Quantum Physics and Applications. A survey of modern physics using elementary quantum mechanics. 225a: Atomic and molecular structure and spectroscopy. Solid state physics. 225b: Nuclear structure decay and reactions. Properties and classifications of elementary particles. Recommended: Mathematics 198. FALL, SPRING. [4–4] Hertel, Kephart.

227a–227b. Intermediate Classical Mechanics. 227a: Vector algebra and coordinate transformations; orbital and rotational angular momentum; gravitational and Coulomb central-force problems; free, forced, damped and nonlinear harmonic oscillations; chaos in simple mechanical systems. 227b: Normal modes; rigid-body motion; special relativity; Lagrangian and Hamiltonian descriptions of classical mechanics; continuum mechanics. Prerequisite for 227a: Mathematics 170 or equivalent. Recommended corequisite for 227b: Mathematics 198. FALL, SPRING. [3–3] Brau, Sheldon.

229a–229b. Electricity, Magnetism, and Electrodynamics. 229a: Electrostatic fields and potentials; Gauss's law; electrical properties of insulators, semiconductors and metals; the Lorenz force; magnetic fields and forces; electromagnetic induction, Maxwell's equations and electromagnetic waves. 229b: Electromagnetic waves in dielectrics and conductors; electromagnetic radiation in waveguide structures; relativistic electrodynamics; magnetism as a relativistic phenomenon. Prerequisite for 229a: three semesters of calculus; corequisite for 229b: differential equations. SPRING, FALL. [3–3] Tolk, Kephart.

239a–239b. Advanced Physics Laboratory. Laboratory work in more advanced techniques or design and construction of new physics teaching experiments. Prerequisite: 225a–225b. [Variable credit: 1–3 each semester, variable total credit 3–6] (Not currently offered)

240. Selected Topics. [Variable credit: 1–3 each semester]

245. Computational Physics. Programming techniques in physics suitable for personal computers: classical scattering, one-dimensional barrier tunneling, Laplace's equation, static and time-dependent Schrödinger's equation, hydrodynamics, and diffusion. Recommended: Computer Science 120. FALL. [3] Maguire

251a–251b. Introductory Quantum Mechanics. Wave-particle duality, indeterminacy, superposition, the Schrödinger equation, angular momentum and scattering, perturbation theory. Prerequisite: 225a and 227a. Recommended: differential equations. FALL. [3–3] Greene, Hertel.

254. Physics of Condensed Matter. Crystal structure and diffraction; phonons and lattice vibrations; free-electron theory of metals; elementary band theory of solids; semiconductors; optical properties of insulators; and applications to solid-state devices, magnetism, and superconductivity. Prerequisite: 223, 225a, and 227b. SPRING. [3] Feldman.

255. Introduction to Particle Physics. Weak, strong, and electromagnetic forces as evidenced by the interactions of elementary particles. Classification of particles and experimental techniques. [3] Sheldon. (Not currently offered)

258. Physics of Magnetism. Magnetism in condensed matter; properties of isolated and interacting magnetic moments; exchange interactions and spin wave excitations; giant and colossal magnetoresistance; application to magnetic memory and spintronics. [3] Tolk. (Not currently offered)

274. Principles and Applications of BioMicroElectroMechanical Systems. Principles, design, fabrication, and application of micro- and nano-devices to instrument and control biological molecules, living cells, and small organisms. Development of microfabricated systems, lab-on-a-chip, and micro- and nano-biosensors. Topical discussions from the research literature. [3] Staff. (Not currently offered)

300. Seminar. FALL. [1] Maguire.

302. Learning to Teach, Teaching to Learn. Directed readings and discussion of topics in the teaching of science and engineering. Practical application of best teaching practices will be emphasized. Intended primarily for first-time teaching assistants and first-year graduate students. FALL. [1] Stassun.

303. Experimental Nuclear Physics. Interactions of charged particles and photons in matter, coordinate transformations, statistics of nuclear processes, radiation detectors and analyzers, and selected topics in the design and application to experiments of par ticle accelerators and instrumentation used in nuclear and high energy physics. Recommended concomitant: 225b. [3] Ramayya. (Not currently offered)

305. Particle and Continuum Mechanics. Least action principle, Lagrange for malism, conservation laws, two-body pr oblem, small-amplitude vibrations, non-iner tial reference frames, canonical for malism, rigid body motion, continuous media, and field theor y. Includes programming on scientific work stations. Pr erequisite: 227a and Math 261a; corequisite: Math 262a. FALL. [3] Varga.

306. Biomolecular Physics. Physical principles applied to the structur e and dynamics of biological molecules on the nanometer scale. Emphasis on the random Br ownian motion that dominates at all length scales, and how bimolecular str uctures move, function, and interact amid chaotic thermal fluctuations. Selected measurement techniques. Prerequisite: one year of calculus and one year of physics. [3] (Not currently offered)

325. Physical Measurements on Biological Systems. (Also listed as Biomedical Engineering 325) A survey of the state of the ar t in quantitative physical measur ement 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 dif fraction for deter mination of macr omolecular structure; magnetic r esonance spectroscopy and imaging. One lectur e and one r ecitation. Prerequisite: modern physics course or consent of instr uctor. [3] Hutson. (Not currently offered)

329a–329b. Advanced Electrodynamics. 329a: Electrostatics, potentials, boundary value problems, multipole moments, polarization, magnetostatics, Maxwell' s equations, electromagnetic wave pr opagation, dissipative and conductive media. 329b: covariant for mulation, least-action principle and Lagrange density , energy momentum tensor , charges in external fields, radiation fr om accelerated changes, multipole radiation. Pr erequisite: 229a–229b, Mathematics 262. [3–3] Umar.

330a–330b. Quantum Mechanics. Wave and matrix for ms of the theor y, transformation theory, theory of angular momentum, systems of indistinguishable par ticles, approximate methods of solution, energy levels and scattering processes, and introduction to relativistic quantum mechanics. Prerequisite: 251, Math 262. [3–3] Csorna, Oberacker.

333a–333b–333c–333d. Theoretical Physics Seminar. Topics such as theor etical nuclear astrophysics, principles of mathematical physics, quantum theor y of finite systems, exotic nuclei near the proton/neutron driplines. Prerequisite: 330a. [1–1–1–1] (Not currently offered)

340a–340b. Nuclear and Heavy-Ion Theory. Phenomenological models (liquid drop, collective and shell models), nucleon-nucleon interaction, micr oscopic theories of nuclear structure (Hartree-Fock, RPA, interacting boson approximation), heavy-ion reactions below 20 MeV/A (TDHF theor y), nuclear physics at inter mediate and high energies (quarks in nuclei, quark-gluon plasma formation). Prerequisite: 330a. [3–3] (Not currently offered)

341. Statistical Mechanics. Phase space, entr opy and r eversibility; ensemble theor y; Fermi and Bose Statistics; systems of interacting par ticles; equation of state, critical phenomena, and phase transitions; pairing and superfluidity. SPRING. [3] Varga.

343. High-Performance Computing for Scientists and Engineers. Introduction to high-performance computing focusing on speedup of science and engineering applications. The course will utilize Vanderbilt's research cluster maintained by the Advanced Computing Center for Research and Education. Students will be expected to complete a class project that introduces some features of high-performance computing to their thesis research. SPRING. [3] Walker, Tackett.

350. Selected Topics in Theoretical Physics. Topics such as Lie groups and symmetry principles in quantum mechanics, quantum electrodynamics of strong fields, phenomenological models of nuclear structure. Prerequisite: consent of instructor. SPRING. [3] Haglund.

351a–351b–351c–351d. Topics in the Physics of Elementary Particles. A single topic reflecting current faculty interest each semester. [1–1–1–1] (Not currently offered)

352a–352b–352c–352d. Special Topics in Experimental Physics. Current topics in experimental physics relevant to research areas in the department, such as biological, condensed-matter, elementary-particle, nuclear, and optical physics, astronomy, astrophysics and cosmology. FALL, SPRING. [Variable credit: 1–3] Staff.

354. Condensed Matter Theory. Free-electron theory of metals; elementary band theory of solids; quantum theory of the harmonic crystal; elementary excitations; optical properties of materials; electronic basis of magnetic interactions; density-functional theory; relativistic band structure; electronic localization and amorphous solids; two-dimensional phase transitions and superlattices. Prerequisite: Physics 330 or consent of instructor. SPRING. [3] Pantelides.

356. Biophysical Electrodynamics. The physics of bioelectric phenomena: the mechanisms that lead to the transmembrane resting and action potentials in nerve and muscle cells, the differential equations describing propagation of the nerve action potential, and the relationship between the transmembrane and extracellular potentials in nerve and cardiac muscle. FALL. [3] Wikswo.

357a–357b. Atomic and Molecular Physics. Quantum mechanical treatment of atomic and molecular structure and dynamics, including binding, transitions, radiative transfer processes, and dynamics of elastic and inelastic scattering of electron-atom and atom-atom systems. Prerequisite: 330a–330b. [3–3] (Not currently offered)

358b. Interaction of Light with Matter. Interaction of electromagnetic radiation with atoms, molecules, and solids. Optical pumping, rate equation treatment of laser action; nonlinear interactions of light with matter, including multiphoton processes, harmonic generation and stimulated scattering; and the behavior of atoms and molecules in intense photon fields. [3] (Not currently offered)

359a. Surface Structure and Dynamics. Geometrical and electronic structure of surfaces, including surface reconstruction, density of states, and effects of adsorbates, impurities, and electronic defects. Prerequisite: 330a–330b. [3] Feldman. (Not currently offered)

360a–360b. General Relativity and Cosmology. Einstein's geometric theory of gravity in terms of tensor analysis and differential geometry. Einstein's field equations are derived and solutions are discussed. Applications of general relativity are explored, including those to very strong gravitational fields, gravitational collapse, neutron stars, black holes, and quantum gravity. Topics in cosmology will include red shifts and cosmic distance relations, big bang cosmology, primordial nucleosynthesis, the very early universe and inflationary cosmologies. Prerequisite: consent of instructor. [3–3] Weiler. (Not currently offered)

361. Nonlinear Dynamics and Chaos. Qualitative and quantitative solutions to nonlinear ordinary differential equations; analytical and numerical techniques; conditions for stable solutions, onset of instability, and chaotic phenomena; connection between classical and

quantum nonlinear systems; textbook presentation and selected applications from current research literature. Prerequisite: 305. [3] (Not currently offered)

365. Many-Particle Quantum Theory. Nonrelativistic theory of atoms, solids, and nuclei; operators in second quantization, fermions and bosons, pair correlation function, interacting electron gas (metal), propagators, Wick's theorem and Feynman diagrams, Har tree-Fock theory, shell model, pairing forces in nuclei, and superconductivity. Prerequisite: 330b. [3] Oberacker. (Not currently offered)

369. Master's Thesis Research.

370a–370b. Quantum Field Theory. Relativistic quantum mechanics, canonical and path-integral field quantization, relativistic scattering theory, perturbation expansions; Feynman diagrams and radiative corrections, renormalization and regularization, with applications to quantum electrodynamics and non Abelian gauge theories. Prerequisite: 305, 329a–329b, 330a–330b. FALL, SPRING. [3–3] Weiler.

390a–390b. Independent Study. [Variable credit, 1–3 each semester] Staff.

391a. Medical Physics Practicum: Therapy. Radiotherapy physics in a clinical setting. Treatment planning instrumentation calibration, quality assurance. Radiotherapy patient interaction, clinical conference attendance, and review of treatment techniques in radiation oncology. Prerequisite: 311, 312, and 314. [6] Coffey.

391b. Medical Physics Practicum: Diagnostic. Diagnostic physics in a clinical setting. Instrumentation methodology, calibration, quality assurance. Diagnostic radiology patient interaction, clinical conference attendance, and review of imaging techniques in radiology. Prerequisite: 313 and 315. [6] Staff.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Medical and Health Physics

224. Physical Analysis of Biological Systems. Applications of physics to human biology, including biomechanics, exponential growth and decay, statistical mechanics and mass transport, bioelectricity and biomagnetism. Prerequisite: one year of calculus. Course in biology recommended. [3] (Not currently offered)

228. Physics of Medical Imaging. Applications of physics to medicine, including signal analysis, image processing, atoms and light, X-rays, nuclear medicine, and magnetic resonance imaging. Prerequisite: one year of calculus. FALL. [3] Peterson.

243. Health Physics. Theory and instrumentation in health physics and radiological physics. Radiation shielding design, methods of external and internal dosimetry, and radiation regulatory issues. Prerequisite: 153 or 225a and one year of calculus. FALL. [3] Stabin.

248. Radiation Biophysics. Response of mammalian cells and systems to ionizing radiation. Acute radiation syndromes, carcinogenesis, genetic effects, and radiobiological basis of radiotherapy. Prerequisite: 228 and Biological Sciences 110a. FALL. [2] Freeman (Radiology and Radiological Sciences).

262. Medical Imaging, Lasers and Energy-Tissue Interactions. Survey of medical technologies, including X-ray, ultrasound, C-T scan, MRI, radiation therapy, and laser medicine and surgery. Each technology will be presented in terms of the fundamental physics and

scientific discovery, research and development, and the application to medical care. The historical, sociological, economic, and ethical impacts of the medical technology will be addressed. Prerequisite: one year of calculus-based physics and Biological Sciences 110a–110b. [3] Staff. (Not currently offered)

285. Radiation Detectors and Measurements. 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. SPRING. [4] Stabin.

301a. Medical Physics Seminar. Radiotherapy treatment techniques and current methodologies in clinical therapy physics. Prerequisite: 228. [1] Staff.

301b. Medical Physics Seminar. Topics in medical imaging, techniques and applications. Prerequisite: 228. [1] Staff.

304. Radiation Interactions and Dosimetry. Theory and instrumentation of ionization measurements of high-energy photon and electron beams. Methods of radiation absorbed dose calculations for photons, k neutrons and charged particles in matter. Prerequisite: 228, 243 and differential equations. SPRING. [3] Duggan.

307. Radiation Dose Assessment. Description of models and methods for internal and external dose assessment. Historical and modern methods for calculating radiation dose, and will gain proficiency in their use by working examples and applying the principles to project analyses. Prerequisite: 243, 304. [3] Stabin. (Not currently offered)

311. Clinical Therapy Physics I. Instrumentation and application of physics to clinical radiotherapy procedures, equations for absorbed dose calculations, phantoms, methodologies in computerized treatment planning, introduction to the special techniques of brachytherapy and stereoradiosurgery. Prerequisite: 228 and 304. FALL. [3] Coffey (Radiology and Radiological Sciences) and Duggan (Radiology and Radiological Sciences).

312. Clinical Therapy Physics II. Photon and electron beam algorithms for dosimetry calculations. Methodologies in three-dimensional treatment planning with specific applications to radiotherapy. Prerequisite: 311 and differential equations. SPRING. [2] Duggan (Radiology and Radiological Sciences).

313. Clinical Diagnostic Physics. Instrumentation and application of physics to clinical diagnostic imaging procedures including: radiographic and fluoroscopic X-ray, CT, MRI, nuclear medicine, and ultrasound. Prerequisite: 228 and 304. FALL. [3] Patton (Radiology and Radiological Sciences) and Pickens (Radiology and Radiological Sciences).

314. Laboratory in Clinical Therapy Physics. Applications of physics to clinical radiotherapy procedures, experience with equipment in a modern clinical radiotherapy environment, methodology and techniques for the verifications of simulated clinical pocedures. Prerequisite: 228 and 311. SPRING. [2] Coffey (Radiology and Radiological Sciences) and Duggan (Radiology and Radiological Sciences).

315. Laboratory in Clinical Diagnostics Physics. Applications of principles, techniques, and equipment used in radiographic and fluoroscopic X-ray, CT, MRI, nuclear medicine, and ultrasound imaging. Prerequisite: 228 and 313. SPRING. [2] Price (Radiology and Radiological Sciences) and Riddle (Radiology and Radiological Sciences).

Astronomy

205. Principles of Astrophysics. Origin and evolution of matter. The tools and methods of astrophysics, including light and telescopes; cosmology and the Big Bang; galaxies and star formation; physics of stars, including nucleosynthesis and stellar death; the solar system and the search for other worlds. No credit for students who have completed 102. Prerequisite: Physics 116a or 117a, or 121a and one semester of college calculus. [3] (Not currently offered)

222. Observational Astronomy. Principles and techniques including astrometry, photographic and photoelectric photometry, spectral classification, and radial velocity measurements. Scheduled evening sessions at Dyer Observatory. Prerequisite: 102 or 175; Physics 225a. FALL. [3] Stassun.

223. Binary Stars. Visual, eclipsing, and spectroscopic binaries; techniques for solving their orbits. Extended atmospheres, circumstellar matter, mass transfer, X-ray and radio emission, and orbital period changes in binaries. Evolution of close binaries. Prerequisite: 102. [3] (Not currently offered)

252. Stellar Astrophysics. Absorption and emission of radiation by the sun and stars. Principles of stellar structure and stellar evolution from formation to death. Prerequisite: Physics 223 and 225a; Mathematics 198. [3] Weintraub. (Not currently offered)

253. Galactic Astrophysics. Interstellar matter and gaseous nebulae, the structure and evolution of normal galaxies, active galactic nuclei and quasars, and observational cosmology. Prerequisite: Physics 225a, Mathematics 198. SPRING. [3] Knop.

260. Introductory General Relativity and Cosmology. Introduction to Einstein's theory which describes gravity as a curvature of spacetime. Tensor analysis, special relativity, differential geometry, spacetime curvature, the Einstein field equations, the Schwartzschild metric for stars and black holes, and the Friedmann-Robertson-Walker metric for cosmology. Designed for undergraduates in the Department of Physics and Astronomy; graduate students should take Physics 360a–360b. Prerequisite: Physics 227a, 229a. Recommended: Physics 227b. [3] Knop. (Not currently offered)

300a–300b. Astronomy Seminar. [1–1] Stassun. (Not currently offered)

307a–307c–307d. Selected Topics in Astrophysics. Stellar atmospheres, stellar interiors, interstellar matter, binaries, variable stars, solar system physics, and galaxies. Prerequisite: consent of instructor. [3–3–3] Staff. (Not currently offered)

311. Nebular Astrophysics. Astrophysics of diffuse nebulae and interstellar gas; photoionization, thermal equilibrium, dynamics. Interstellar medium, dust, planetary nebulae, supernova remnants, HII and star forming regions, and active galactic nuclei. Prerequisite: Physics 229b. [3] Knop. (Not currently offered)

322. Methods in Observational and Computational Astronomy. FALL. [3] Stassun.

352. Stellar Astrophysics. SPRING. [3] Stassun.

369. Master's Thesis Research.

Political Science

CHAIR C. Neal Tate
DIRECTOR OF GRADUATE STUDIES Stefanie A. Lindquist
PROFESSORS EMERITI Robert H. Birkby, Alex N. Dragnich, Erwin C. Hargrove, William C. Havard Jr., Richard A. Pride, Harry Howe Ransom, Derek J. Waller, Benjamin Walter
PROFESSORS William James Booth, Mark E. Brandon, John G. Geer, George J. Graham Jr., M. Donald Hancock, Bruce I. Oppenheimer, James Lee Ray, Mitchell A. Seligson, Carol M. Swain, C. Neal Tate
ADJUNCT PROFESSORS Klinton J. Alexander, Vaughn May, Roy Neel
ASSOCIATE PROFESSORS Florence Faucher-King, Marc J. Hetherington, Jonathan T. Hiskey, Stefanie A. Lindquist
ASSISTANT PROFESSORS Brooke A. Ackerly, Brett V. Benson, Katherine B. Carroll, Pamela C. Corley, Suzanne Globetti, Christian R. Grose, Michaela Mattes
SENIOR LECTURERS Eleanor B. Fleming, Katsiaryna Ivanova

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

☙ THE master's degree in political science may be earned through (a) a program that requires 24 hours of course work and a thesis or (b) a non-thesis option requiring 33 hours of course work (including political science 350 and 351 and at least 27 hours of 300-level courses) and a master's degree examination in the student's field of choice. A master's degree in passing option is available to students who have completed all courses required for the Ph.D. degree, passed the preliminary examinations, and defended successfully the dissertation proposal.

At least 48 hours of formal course work are required for the Ph.D. degree. Statistics for Political Research (356), required of all prospective candidates, is normally taken in the first year of residence.

Candidates for the Ph.D. are expected to demonstrate proficiency in research skills, including statistics, at a level fixed by the program faculty.

201. Contemporary Political Theory. Recent political philosophy. Democratic theory, multiculturalism, feminism, post-modernism. SPRING. [3] Ackerly.

202. History of Classical Political Philosophy. Intensive analysis of the principal political philosophers in the classical tradition. FALL. [3] Graham.

203. Modern Political Philosophy. Intensive analysis of the principal political philosophers in the modern tradition. SPRING. [3] Graham.

204. American Political Thought. An analytical study of American political theories and their impact upon our political institutions. [3] (Not currently offered)

205. Modern Political Ideologies. Analysis of the belief systems of selected political movements, groups, and societies; their relationship to political philosophy; and theories of political action. [3] (Offered 2007/2008)

206. Foundations of Marxism. Intensive analysis of the political, philosophical, and economic theories of Karl Marx in the context of European philosophical and political traditions. Major critical interpretations of Marx will be stressed. FALL. [3] Graham.

207. Liberalism and Its Critics. Philosophical and political analysis of the utilitarianism of Mill and Bentham and the liberalism of Locke and Kant. Critiques by contemporary Libertarians and Communitarians. SPRING. [3] Booth.

208. Law, Politics, and Justice. Contemporary and classical theories of law and society; rights theories; gender and the law; law and transitions to democracy; law between nations. SPRING. [3] Corley.

209. Issues in Political Theory. Topics vary from semester to semester. May be repeated once if there is no overlap with previous offerings. Prerequisite: 202, 203, 205, or 206. FALL, FALL. [3] Ackerly.

210. West European Politics. Analysis of political development, social forces, institutions, and public policy in Great Britain, France, Germany, Italy, and Sweden. FALL, SPRING. [3] Faucher-King, Hancock.

211. The European Union. Political and economic integration. Origins, institutions, decision processes, policies, achievements, and prospects of the European integration movement. FALL. [3] Hancock.

213. Democratization and Political Development. 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. No credit for students who have taken 317. SPRING. [3] Hiskey.

214. The Japanese Political System. Study of the government and politics of Japan, in the context of the interaction of traditional and modern elements in contemporary Japanese political style. [3] (Not currently offered)

215. Change in Developing Countries. Comparative study of political and economic change in developing countries. Political implications of ethnicity, economic dependency, and environmental degradation. [3] (Not currently offered)

216. The Chinese Political System. 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. [3] (Not currently offered)

217. Latin American Politics. Cross-national analysis of political institutions, cultures, and processes of change in Latin America. FALL. [3] Hiskey.

218. Social Reform and Revolution. Reform and revolution as responses to social inequality. Causes and outcomes of reform and revolution in Europe and Latin America from the mid–nineteenth century to the present. [3] (Not currently offered)

219. Politics of Mexico. 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. [3] Hiskey. (Offered 2007/2008)

220. Crisis Diplomacy. Analysis of 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. SPRING. [3] Staff.

221. Causes of War. Scientific study of the onset of expansion and consequences of war; conditions of peace, emphasizing alliances, arms races, and crisis escalation. FALL, SPRING. [3] Mattes.

222. American Foreign Policy. Critical analysis of major international and domestic factors shaping U.S. foreign relations as reflected in selected twentieth-century experiences. FALL, SPRING. [3] Staff, Ray.

224. Theories of World Politics. Analysis of major theories of the basic factors underlying global relations. [3] Ray. (Offered 2007/2008)

225. International Political Economy. 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. FALL. [3] Alexander.

226. International Law and Organization. The role of international law and international organizations in the contemporary global political system. Focus on the evolution and impact of international law as well as such organizations as the United Nations, the International Monetary Fund (IMF), and selected regional (as well as nongovernmental) organizations. FALL, SPRING. [3] Mattes, Alexander.

227. Economics and Foreign Policy. Economic factors influencing foreign policy behavior, including economic factors, conditions, and motivations for conflictual and cooperative relations. Economic instruments used by governments to achieve policy goals: trade ties, economic sanctions, foreign aid. Economic theories of war and peace. FALL. [3] Staff.

228. International Politics of Latin America. 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. [3] Staff. (Offered 2007/2008)

229. Strategy and International Politics. 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. SPRING. [3] Benson.

231. Contemporary Issues in Europe. Detailed analysis of the political, economic, and social issues facing Europe's post–Cold War period including regional integration, transitions to democracy, economic transformation, ethnic-national relations, industrial organization, environmental politics. [3] Hancock. (Offered 2007/2008)

232. Evolution in French Foreign Policy Under the Fifth Republic. Development of distinct French foreign policy; use of colonial experience in the North-South dialogue; France's place in the new international order. Offered at Vanderbilt in France. [3] (Not currently offered)

233. Social Movements in the Developed and Developing Worlds. Comparative study of protest movements with emphasis on origins, activities, and impact of movements focusing on women, ethnic minorities, and the environment. [3] (Not currently offered)

234. Women, Politics, and the Development of the Third World. Analysis of the special problems afflicting women in the developing world and examination of proposed strategies, domestic and international, for reform. [3] Staff. (Not currently offered)

238. Comparative Political Parties. Political parties and their role in the democratic process of modern liberal western democracies, focusing on party systems and party organizations. SPRING. [3] Faucher-King.

239. Comparative Courts and Judicial Politics. Introduction to the structure, function, political significance, and policy making of courts and the judges who staff them, especially outside the boundaries of the United States. No credit for students who have completed 288-01 or 288–04. SPRING. [3] Tate.

240. Political Parties. 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. FALL. [3] Oppenheimer.

241. American Public Opinion and Voting Behavior. The development and dynamics of political opinion and its effects on voting and public policy. Models of political behavior. SPRING. [3] Grose.

242. Political Communication. The relationship of government and the press. Theories of communication; mass media and sociopolitical change; political persuasion and propaganda; responsibilities of the press. SPRING. [3] Staff.

243. Political Campaigns and the Electoral Process. Theories of representation and democratic accountability; electoral strategies and tactics, including political polling and analysis. FALL. [3] Grose.

244. The Legislative Process. 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. SPRING. [3] Oppenheimer.

245. The American Presidency. Constitutional, historical, and political aspects. Attention to nominating and electing the president, presidential leadership and personality, governing, and relations with Congress and the public. FALL. [3] Staff.

247. American Political Culture. 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. FALL. [3] Fleming.

253. Ethics and Public Policy. Ethical argument in the public policy process; major approaches to ethics applied to specific issues of public policy. [3] (Offered 2007/2008)

255. Public Policy Problems. Specific problems of public policies and their relations to political and institutional structures. Particular policy problems vary from semester to semester. May be taken more than once only if there is no overlap with a prior offering. [3] (Not currently offered)

260. Introduction to American Law. Law as a component of public policy and the political system; the elements and rationale of private law. FALL. [3] Corley.

261a. Constitutional Law: Powers and Structures of Government. Development of 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 completed 261. FALL. [3] Lindquist.

261b. Constitutional Law: Civil Liberties and Rights. Supreme Court's interpretation of the Bill of Rights and the Fourteenth Amendment. Case method. No credit for students who have completed 261. SPRING. [3] Corley.

262. The Judicial Process. Functioning of the judiciary in the American political process; operation and powers of the courts; nonlegal aspects of the judicial process; political role and effects of judicial decisions. SPRING. [3] Lindquist.

263. Religion and Politics. Religion in democratic societies. Abortion, gay marriage, faith-based initiatives, and the Pledge of Allegiance. Historical works and contemporary contributions to debates. FALL. [3] Booth.

270. Conducting Political Research. Introduction to research sources, designs, and methods used by political scientists. Emphasis will be placed on locating and accessing data, the logic of causal inferences, and basic data presentation and analysis. SPRING. [3] Staff.

300. Political Theory. Basic course in political theory. Surveys major texts in political theory, as well as central concepts and debates in the current literature. SPRING. [3] Graham.

302. Democratic Theory. Growth of democratic theory in political philosophy and historical application. Connections between democratic theory and political institutions. FALL. [3] Booth.

303. Philosophy of Science for Social Science. Survey of basic texts and issues within the philosophy of science as these are relevant within the social sciences. The materials are explored from the perspectives of the different theoretical and methodological options within the social sciences with rigorous applications to examples within the basic sub-fields of political science and from the cognate disciplines from which political science research and theorizing draws (including parallels from the disciplines of anthropology, economics, history, psychology, and sociology). [3] Graham.

305. Feminist Social and Political Thought. Feminist political theorists, both as critics of the history of political thought and as authors of contemporary social and political theory. [3] Ackerly.

306. Problems of Interpretation in Political Theory. Major interpretive problems of political theory. Emphasis on philosophical assumptions, meaning, text, and context. May be repeated for credit if topics vary sufficiently. [3] Staff.

308. Studies in Historical Political Thought. Major texts and themes focusing on a single thinker, a school of thought, or a theme. May be repeated with different topics. SPRING. [3] Ackerly.

309. Research in Political Theory. Supervised individual research and reading on selected topics in political theory. FALL, SPRING. [3] Staff.

310. Studies in Comparative Analysis. A survey of important literature and concepts in the field of comparative politics. FALL. [3] Hiskey.

311. Regional and International Dimensions of European Integration. Theories of political and economic integration; key actors in the European Union (including national and subnational governments, EU institutions, interest groups, and citizens); principal EU policy arenas and issues (including economic and monetary union, the single market, the common agricultural policy, regional policies, joint foreign and security policies). SPRING. [3] Hancock.

312. Comparative European Politics. Political development, institutions, behavior, and public policies in key West European democracies. Thematic foci include postindustrialism, corporatism, and political management of the economy. [3] Hancock.

315. Research in Latin American Politics. Recurring and novel topics in Latin American politics, such as the relation between economic growth and political regimes, the role of the Church, human rights, and U.S. foreign policy. Particular issues vary from semester to semester. [3] Hiskey, Seligson.

316. Politics of Change in the Third World. Patterns and problems in Third World countries, including transnational developments and linkages such as foreign aid and alignments, multinational corporations and other such institutions, regional groupings, "development," and "modernization." [3] Seligson.

318. Qualitative Methods and Small-N Analysis. Theoretical introduction and practical application of various methods of qualitative analysis, including case studies, small-N comparison, Boolean analysis, event-structure analysis, counter-factual analysis, and concept formation. [3] (Not currently offered)

319. Research in Comparative Analysis. Supervised individual research and reading on selected topics in comparative politics. FALL, SPRING. [3] Staff.

320. International Politics. Basic course in international politics. Surveys major subfields, focusing on concepts and theories that orient research—e.g., balance of power, interdependence, imperialism, decision-making, crisis-behavior. FALL. [3] Ray.

321. International Conflict: Theories and Methods. Analysis of international conflict and war. [3] Staff.

322. Peace Research. Alliances, crisis escalation, territorial disputes, and characteristics of peaceful systems. [3] Staff.

323. Current Theory and Research in World Politics. Recent trends in theory construction, research design, and findings. [3] Staff.

325. International Political Economy. Patterns of conflict and cooperation in the world economy. Theories of world systems, dependency, neoclassicism, regimes, and public choices, their applicability to trade, money, debt, industrial organization, economic development, regional integration. [3] Staff.

326. The Political Economy of War and Peace. Economic theories of war and peace, including economic actors, conditions, and motivations believed to contribute to conflict and cooperation between nations. "Economic statecraft" will also be covered. [3] Staff.

327. Domestic Politics and International Interactions. Impact of domestic political structures and processes on foreign policies and international politics. Extent to which factors external to states in their international environment affect domestic politics. [3] Staff.

329. Research in International Politics. Supervised individual research and reading on selected topics in international politics. FALL, SPRING. [3] Staff.

330. Studies in American Politics. A survey of important literature and concepts in the field of American politics. SPRING. [3] Oppenheimer.

331. Party Politics. Structure and functions of political parties; theories of partisan change, party formation, and party organization. Influence on rules and the behavior of politicians on party policies. [3] Hetherington.

332. Electoral Behavior and Public Opinion. Theories of voting and behavior of candidates in American elections; models of electoral change; the development and dynamics of public opinion. Effects of elections and public opinion on policy and governmental action. [3] Staff.

333. Political Culture, Opinion, and Behavior. Politics as a contest of meaning; how issues, structures, and events are signified; the patterns and distributions of core beliefs as the foundation of individual and collective political behavior and institutional politics. [3] Staff.

334. Executive Institutions. Theories of decision making and implementation in executive institutions. Application of theory to the executive institutions of American government, including the presidency, cabinet departments, and agencies. The relationships of elected politicians, political appointees, and civil servants in executive institutions. [3] (Not currently offered)

335. Politics of American Legislation. The structure and function of American legislative institutions, especially Congress, and their relation to the wider setting. [3] Oppenheimer.

336. The Judicial Process. The role of the judiciary in the American political process; operation, staffing, and powers of the courts; political role and effects of judicial decisions; policy-making by the courts. [3] Lindquist, Tate.

339. Research in American Politics. Supervised individual research and reading on selected topics in American politics. FALL, SPRING. [3] Staff.

355. Research Design. Introduction to Analysis of Tables, Measures of Association, OLS regression. Coverage of research design. Experimental design, survey research, elite interviewing, in-depth interviewing, aggregate data, field research, content analysis, case studies, and small-n analysis. Emphasis on concept formation and measurement. FALL. [3] Tate.

356. Statistics for Political Research I. Introduction to statistical analysis with applications in political science, statistical distributions, statistical inference, bivariate and multiple regression, logit, and probit. SPRING. [3] Globetti.

357. Statistics for Political Research II. Advanced topics in statistical analysis with research applications in maximum likelihood estimation, logit and probit analysis, simultaneous equation models, generalized least squares, and introductory time series concepts. [3] Globetti.

358. Topics in Political Methodology. May be repeated for credit when topics vary. [3] Staff.

359. Introduction to Formal Theory and Modeling. Social choice and game theory. Instability and disequilibria of group decisions under different decision-making rules. Theoretical model building as a way to generate hypotheses. Rules in decision making, manipulability of outcomes, bargaining strategies and the evolution of cooperation. SPRING. [3] Benson.

360. Topics in Formal Theory and Modeling. May be repeated for credit when topics vary. [3] (Not currently offered)

361. Writing Proposals and Securing Grants in the Empirical Social Sciences. FALL. [3] Seligson.

369. Master's Thesis Research. [0]

370. Topics in Political Science. An inquiry into selected topics. May be repeated for credit when topics vary. Consult *Schedule of Courses* for offerings. [3] Staff.

390a–390b. Independent Study. FALL, SPRING. [Variable credit: 1–3 each semester]

398. Dissertation Seminar. Focus on developing the theoretical, empirical, and normative aspects of each student's dissertation research. SPRING. [3]

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Psychology

CHAIR Andrew J. Tomarken
DIRECTOR OF GRADUATE STUDIES Thomas J. Palmeri
DIRECTOR OF CLINICAL TRAINING Jo-Anne Bachorowski
PROFESSORS EMERITI William F. Caul, Keith N. Clayton, Martin Katahn, Joseph S. Lappin, Richard D. Odom, Leslie Phillips, Oakley S. Ray, Hans H. Strupp, Warren W. Webb
PROFESSORS Randolph Blake, Vivien A. Casagrande, Ford F. Ebner, Robert Fox, Jeffery J. Franks, Steven D. Hollon, Jon H. Kaas, Gordon D. Logan, Timothy P. McNamara, Sohee Park, Jeffrey D. Schall, William P. Smith
ASSOCIATE PROFESSORS Jo-Anne Bachorowski, Isabel Gauthier, René Marois, Thomas J. Palmeri, Anna Roe, David G. Schlundt, Andrew J. Tomarken
ASSISTANT PROFESSORS Stephen D. Benning, Denise Davis, Merida Grant, Bunmi O. Olatunji, Andrew Rossi, Adriane Seiffert, Frank Tong, David Zald
RESEARCH ASSISTANT PROFESSORS Hans Peter Melzer, Iwona Stepniewska, Susanne Sterbing
SENIOR LECTURERS Leslie D. Kirby, Leslie M. Smith, N. Jane Zbrodoff

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

☙ THE graduate program in psychological sciences marshals the combined resources of the Department of Psychology in the College of Arts and Science and the Department of Psychology and Human Development in Peabody College. The program offers doctoral-level (Ph.D.) study for students who intend to become psychological scientists or scientist-practitioners. Students who plan to terminate their studies with the master's degree should not apply. Although students and faculty are each associated with a primary home department (either the Department of Psychology or the Department of Psychology and Human Development), a common set of requirements applies to all students.

Five primary areas of interest are represented in the psychological sciences graduate program (clinical science, cognition and cognitive neuroscience, developmental science, neuroscience, quantitative methods and evaluation). In addition, some faculty and students participate in an interdisciplinary program in social psychology. The Department of Psychology in the College of Arts and Science has particularly strong representation in the areas of clinical science (with a general focus on adult populations), cognition and cognitive neuroscience, and neuroscience. These concentrations constitute the primary area groups within the department. However, faculty and students also contribute to the other areas of interest represented within the broader psychological sciences program.

The primary objective of graduate training is to promote the development of the necessary conceptual and methodological skills that will allow our graduates to function as independent scientists who conduct innovative and important research. Consistent with this goal, we expect our graduate students to be continually involved in research throughout their graduate training. Candidates for the Ph.D. degree must have completed 72 hours of graduate credits with a minimum of 24 hours in formal

course and seminar work. In addition, students must satisfactorily complete a qualifying examination for Ph.D. candidacy.

Students seeking admission to the program should apply to Psychological Sciences. Applicants should submit scores on the General test and an advanced test of the Graduate Record Examination. In addition to overall potential for a scientific career, the fit between an applicant's research interests and those of a potential faculty mentor significantly influence admissions decisions. Admission is not limited to students with undergraduate backgrounds in psychology.

201. Neuroscience. A comprehensive introduction to the field of neuroscience from important molecules to cell function to neural systems to cognition. Topics include the physiology of nerve cells, the sensory systems of vision, audition and touch, the motor system, sleep, consciousness, speech, and sexual behavior. Coverage of clinical topics includes the chemical basis of the psychoses, diseases of the brain, and repair mechanisms after brain injury. FALL, SPRING. [3] L. Smith, Marois.

208. Principles of Experimental Design. An introduction to theory and research methods in psychological science. Topics include philosophy of science, ethical issues, experimental design, and data interpretation. Not open to students who have received credit for Psychology 213. FALL, SPRING. [3] Seiffert, Palmeri.

209. Quantitative Methods. Introductory survey of principles and methods for the statistical analysis of experiments, with emphasis on applications in psychology. Major topics are descriptive and inferential statistics. Prerequisite: 208. FALL, SPRING. [3] Franks.

211. Personality. Introduction to the study of personality. Major theories of personality development, methods of assessment, and results of research. The study of normal behavior is emphasized. SPRING. [3] Zald.

214. Perception. Current theory and research in sensation and perception, including an analysis of philosophical and biological issues. Understanding how biological organisms acquire, process, and use information about objects and events in the environment. Vision, audition, taste, smell, and touch. FALL, SPRING. [3] Blake, Fox.

215. Abnormal Psychology. Introduction to the study of deviant behavior. Topics include definitions of adequate human functioning, processes that disrupt functioning, and methods of evaluation and treatment. No credit for students who have taken 115a Section 2 (Abnormal Psychology). FALL. [3] Hollon.

216. Movement. Psychological, computational, and neural perspectives on the activities of looking, reaching, grasping, speaking, smiling or frowning, walking, and running. FALL. [3] Schall.

225. Cognitive Psychology. Attention, pattern recognition, knowledge representation, language, reasoning, and human intelligence. FALL, SPRING. [3] Zbrodoff.

226. Thinking and Reasoning. A survey of research findings, theories, and empirical approaches to understanding how we "think." Deductive reasoning, decision making, categorization, problem solving, and human rationality. [3] (Not currently offered)

231. Social Psychology. The influence of social conditions upon behavior in interpersonal and group relations; perception, judgment, learning, and attitudes. FALL, SPRING. [3] Kirby, W. Smith.

232. Mind and Brain. Introduction to cognitive neuroscience. How the brain supports perception, cognition, attention, memory, language thought, emotion, social judgments, and consciousness. SPRING. [3] Tong.

234. Laboratory in Behavioral Neuroscience. Experimental methods in behavioral neuroscience. Computer-based data acquisition and analysis, statistical reasoning, and manuscript preparation. Prerequisite: 201. SPRING. [4] Rossi.

235. Biological Basis of Mental Disorders. Recent discoveries of brain changes that alter mental functioning. How a malfunctioning brain can produce suicidal behavior, mood and anxiety disorders, schizophrenia, alcoholism, and sexual dysfunction. How drug abuse results in altered brain chemistry and how organic brain diseases such as epilepsy, AIDS, or stroke can cause cognitive impairment. Prerequisite: 201. SPRING. [3] L. Smith.

240. Cognition, Consciousness, and Self. Perspectives from Buddhist psychology, cognitive, physical, and biological science. FALL. [3] Franks.

241. History of Neuroscience. Ideas about brain function from ancient Egypt to modern times. Technologies and scientists that have contributed to our current understanding of the brain. No credit for students who have completed 285, The History of Neuroscience. Prerequisite: 201. FALL. [3] Rossi.

245. Emotion. Introduction to the study of emotion. Topics include defining emotion, functions of emotion, emotion and health, emotion and psychopathology, individual differences, and emotional development. Repeat credit for students who have taken 288, Emotional Processes. FALL. [3] Kirby.

252. Human Sexuality. 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, crosscultural perspectives, pornography, rape, AIDS, and homosexuality. FALL. [3] L. Smith.

254. Laboratory in Perception. Applications of experimental methods to the study of human perception. Psychophysical techniques, signal detection theory, direct and indirect scaling, chronometric analyses. Prerequisite: 208, 209, and 214. [3] (Not currently offered)

258. Animal Behavior and Evolutionary Psychology. A comparative and phylogenetic approach to the study of behavior, with special emphasis on sensory processes, instinctive behavior, the genetics of behavior, and ethology. SPRING. [3] Kaas.

266. Interpersonal and Intergroup Relations. (Also listed as Sociology 262) An examination of social psychological literature related to intergroup and interpersonal conflict and its resolution, with special attention to problems of relations between black and white in contemporary society. [3] (Not currently offered)

269. Developmental Neuroscience. Normal and abnormal brain development. Cell division, migration, cell death, synapse formation, plasticity, and clinical syndromes. Prerequisite: 201. FALL. [3] Ebner.

272. Structure and Function of the Cerebral Cortex. Classic and current concepts of cerebral function. Species differences, receptive field organization, neurotransmitters, modifications by experience, and behavioral effects. Prerequisite: 201. SPRING. [3] Ebner.

274. Neuroanatomy. Gross structure, histological architecture, and techniques for creating images of the human brain. FALL. [3] Roe.

277. Brain Damage and Cognition. Effects of neurological impairment from stroke, injury, or disease on perception, speech, memory, judgment, and behavior. Relation between brain systems and cognitive systems. SPRING. [3] Gauthier.

The following courses are seminars devoted to intensive study of special topics.

280. Special Topics in Perception. FALL. [3] Fox.

282. Special Topics in Cognitive Psychology. [3] (Not currently offered)

285. Special Topics in Neuroscience. [3] (Not currently offered)

286. Special Topics in Human Competence. [3] (Not currently offered)

288. Special Topics in Clinical Psychology. [3] (Not currently offered)

289. Special Topics in Social Psychology. SPRING. [3] W. Smith.

300a. Research Seminar. [Variable credit: 1–4]

301a–301b. Advanced General Psychology . Physiological psychology, perception and sensation, learning, complex processes, developmental, personality, social psychology, and psychopathology. Participation in various sections determined by each student's background and career interests. [3–3] Staff.

302. History and Systems of Psychology . Modern psychology viewed in the perspective of problems and theories of the past. Emphasis on major concepts, problem areas, developing methodology, and "schools" from which much of modern psychology has evolved. [3] (Not currently offered)

303. Models of Human Memory. Survey of contemporary models of human memory, especially formal models. Methods of fitting models to data will be discussed. Prerequisite: graduate course on cognition. [3] (Not currently offered)

304b. Quantitative Methods and Experimental Design. Principles and methods for the design and analysis of experiments and for the investigation of individual differences. Principles of experimental design and descriptive and inferential statistics. [3–3] Tomarken.

305. Linear and Nonlinear Mixed Effects Models. The analysis of data from hierarchical and multilevel designs. Theory and computational methods, specification and testing of fixed effects, random effects and residuals, assessment of fit, graphical examination, applications to repeated measures data, and missing data models. Prerequisite: 304b or equivalent. [3] (Not currently offered)

306. Evolutionary Psychology. Interdisciplinary analysis of the origins of mind, with particular emphasis on the mind/brain as a product of biological evolution. [3] (Not currently offered)

307. Group Process and Structure. Social psychological theory relating to phenomena of social interaction; methodological and substantive problems in selected areas of research, such as group problem-solving, and interpersonal bargaining. [3] (Not currently offered)

309. Structural Equation Modeling. Applications of structural equation modeling. Confirmatory factor analysis, path analysis, causal modeling with latent variables, latent growth curve and panel models, multiple-group and multiple-level models, and the treatment of missing data. Principles of identification, estimation, and fit. [3] (Not currently offered)

310. Research Methods in Clinical Psychology . Major methodological and quantitative issues in clinical psychology, including statistical significance testing and its alternatives; threats to internal and external validity; psychometric theory; quantitative approaches to classification; behavioral, genetic, and psychophysiological methods; animal models; analysis of change, mediation, and moderation. [3] (Not currently offered)

Courses 312, 314, 315, 323, and 324 are limited to psychology Ph.D. students.

312. Psychological Assessment. Major techniques of psychological assessment, with an emphasis on the rationale, administration, and interpr etation of measur es assessing personality and psychopathology. SPRING. [3] Zald.

315. Theories of Psychotherapy. Advanced study on the major principles, concepts, techniques, and issues r elevant to the theor y and practice of psychotherapy . Experience in supervised clinical settings or observation of clinical sessions is pr ovided to further understanding of psychotherapeutic processes. FALL. [3] Davis.

316. Brain Imaging Methods. Principles and methods used in human neur oimaging, with emphasis on functional magnetic r esonance imaging (fMRI). [3] (Not curr ently offered)

323. Practicum in Psychological Assessment. FALL, SPRING. [Variable credit: 1–5 each semester] Staff.

324. Practicum in Psychotherapy. FALL, SPRING. [Variable credit: 1–5 each semester] Staff.

325. Advanced Standing in Psychological Assessment. FALL, SPRING. [Variable credit: 1–5 each semester] Staff.

326. Advanced Standing in Psychotherapy . FALL, SPRING. [V ariable credit: 1–5 each semester] Staff.

331a–331b. Advanced Investigational Techniques. A non-thesis research project. Should be registered for only after consultation with the staf f member who will be supervising the work. [Variable credit: 1–3 each semester] Staff.

335. Special Topics in Neuroscience. (Also listed as Cell and Developmental Biology 335 and Neuroscience 335) Basic issues in neuroscience. Possible topics include neural development, neural plasticity, regeneration, organization and function of cortex, sensory systems, motor systems, and research methodology in neuroscience. A new topic is considered each semester (as per Cell and Developmental Biology). Pr erequisite: Cell and Developmental Biology 323 or equivalent course. [2] (Not currently offered)

336. The V isual System. (Also listed as Cell and Developmental Biology 347, Electrical Engineering 351, Neuroscience 347) An inter disciplinary approach to how humans see and interpret their visual environment. Topics include the structur e of the eye and brain (including optics), the physiology of individual cells and gr oups of cells, machine vision and models of visual function, visual attention, and mechanisms of complex visual per ception. Lectures by faculty from Psychology, Engineering, and Cell and Developmental Biology. Graduate students attend one hour discussion section per week, in addition to lectur e, and turn in a more extensive paper than undergraduates. SPRING. [3] Roe.

The following graduate seminars, 341–355, may be repeated up to four times each.

342. Seminar: Social. FALL. [3] W. Smith.

343. Seminar: Perception. [3]

344. Seminar: Neuroscience. [3]

351. Seminar: Cognitive Psychology. FALL, SPRING. [3] Tong, Palmeri, Logan.

352. Seminar: Clinical Psychology. [3]

353. Professional Ethics in Clinical Psychology. Issues and practical applications of ethical principles in clinical and r esearch settings. Cultural context for clinical and ethical issues. SPRING. [3] Davis.

354. Clinical Neuropsychology. Cognitive and behavioral disorders associated with brain injury and disease. Methods of neuropsychological assessment. Prerequisite: 343P or permission of instructor. [3] (Not currently offered)

357. Seminar in Cognitive Science. Integration of the subareas of cognitive science. FALL, SPRING. [Variable credit: 1–2 hours each semester] Staff. May be repeated up to four times.

358. Seminar in Neuroscience. Integration of the subareas of neuroscience. FALL, SPRING. [Variable credit: 1–2 hours each semester] Staff. May be repeated up to four times.

360. Seminar in Clinical Science. Integration of the subareas of clinical science. Includes history and systems of psychology as related to clinical science, ethical issues, and problems encountered in professional psychology. FALL, SPRING. [Variable credit: 1–2 hours per semester] May be repeated up to four times.

361. Interdisciplinary Seminar in Social Psychology. Integration of the disciplinary subareas of social psychology. May be repeated up to four times. FALL, SPRING. [1–2] W. Smith.

369. Master's Thesis Research. [0]

398. Internship. FALL, SPRING. [0] Staff.

399. Ph.D. Dissertation Research.

Psychology and Human Development

CHAIR Kathleen V. Hoover-Dempsey
DIRECTOR OF GRADUATE STUDIES David Cole
PROFESSORS EMERITI Alfred A. Baumeister, Penelope H. Brooks, H. Carl Haywood, John R. Newbrough
PROFESSORS Camilla P. Benbow, Leonard Bickman, Thomas H. Carr, David Cole, Bruce E. Compas, David S. Cordray, Paul R. Dokecki, Elisabeth M. Dykens, Dale Farran, Judy Garber, James H. Hogge, Steven D. Hollon, Ann P. Kaiser, David Lubinski, John J. Rieser, Howard M. Sandler, James H. Steiger, Wendy L. Stone, Tedra Ann Walden, Lynn S. Walker
ASSOCIATE PROFESSORS Kathleen V. Hoover-Dempsey, Robert B. Innes, Dan Levin, Laura R. Novick, Craig A. Smith, Bahr Weiss
RESEARCH ASSOCIATE PROFESSOR Georgine M. Pion
ASSISTANT PROFESSORS Jessica W. Giles, Bethany Rittle-Johnson, Megan Saylor, Georgene L. Troseth
RESEARCH ASSISTANT PROFESSORS Chase A. Lesane-Brown, Julia Noland
ASSISTANT CLINICAL PROFESSORS Vicki S. Harris, Patti Parkison Van Eys
SENIOR LECTURER Steven McFadyen-Ketchum

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

❧ THE graduate programs in psychology and human development emphasize basic research as well as empirical, data-based approaches to practical problems in education and human development. There is particular concern with the discovery of new ways to bring psychological

knowledge and research skills to bear on societal problems, especially those amenable to intervention during the early years of life.

Major in Psychology and Human Development

Department	*Area of Specialization*
Psychology and Human Development	General Psychology (M.S. only)
	Clinical Psychology
	Cognitive Studies
	Developmental Psychology
	Quantitative Methods

For the Ph.D., areas of specialization include clinical psychology, cognitive studies, developmental psychology, and quantitative methods. Students may take a master's degree as part of their doctoral program.

Specific guidelines and requirements beyond general departmental regulations are set by training committees in each area of specialization.

210P. Introduction to Statistical Analysis. Selection, application, and interpretation of measures of relative frequency, location, dispersion, and association. Approaches to statistical inference. Not open for credit to graduate students in psychology. [3]

211P. Statistical Analysis. Second course in statistics for upper division undergraduates and students in education, counseling, special education, and related social and behavioral sciences. One-factor and multifactor analysis of variance designs with both between-groups and within-groups factors, goodness of fit and contingency analysis, measures of general and linear regression. Inferences concerning means, variances, proportions, and correlations. [3]

289P. Ethics for Human Development Professionals. 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]

301P. Methods of Psychological Research. Methods for collecting and analyzing empirical information about behavior. Serves as a base upon which to build research competence through more advanced courses and research apprenticeships. [3]

303P. Research Methods in Developmental Psychology. Major empirical approaches to the study of development. Emphasis on human behavioral development, although elements from comparative psychology and biomedical sciences included. [3] (Not currently offered)

304P. Field Research Methods. The purpose of this course is to provide the student with an introduction to applied social research in field settings. The course will provide the student with an understanding of basic issues in measurement and design as well as practical skills needed to conduct research in real world settings. Basic knowledge of statistics suggested. [3]

305P. Research Methods in Child Clinical Psychology. Research with clinical populations with a particular emphasis on methods applied to the study of children, youth, and families. [3]

309P. Introduction to Statistical Inference.

310P. Statistical Inference. Introductory course designed to familiarize doctoral students with the principles and procedures of statistical inference and to prepare them for more advanced work in research design and analysis. [3]

311P. Experimental Design. Application of statistical concepts and inferential techniques to the design and analysis of experiments in the behavioral sciences. Advanced procedures for analysis of variance and analysis of covariance. Prerequisite: 310P or equivalent. [3]

312P. Multivariate Statistics. Psychological measurement theory, along with correlational and regression analysis techniques essential to the development of that theory. Prerequisite: 310P or equivalent. [3]

313P. Correlation and Regression.

314P. Structural Equation Modeling.

315P. Program Evaluation. The evaluation of social programs. The design of evaluations to produce both theoretically meaningful and practical information about the program and its effectiveness. Such topics as needs assessment, monitoring, impact assessment, and cost/effectiveness evaluations. Covers programs in education, health, and human services. [3]

317P. Psychological Measurement. Fundamental concepts, methods, and principles of psychological measurement. Particular attention will be devoted to reliability and validity issues underlying psychometric theory, and how psychometric theory relates to the assessment of individual differences or human variation more generally. Topics will include multiple regression, factor analysis, and item response theory. [3]

318P. Individual Differences. Focuses on traditional concepts and findings in the area of individual differences broadly defined. The psychological content will primarily involve abilities, interests, and personality; methodological issues encountered in assessing these attributes will be stressed throughout; and particular attention will be devoted to how these concepts can enhance research programs in both applied and theoretical areas. The specific variables discussed within each domain will be restricted to those that have empirically "panned out" (viz., variables that are reliable and related to meaningful behaviors and outcomes that psychologists are interested in predicting and better understanding), rather than theoretical constructs and measures whose external validity is unknown. [3]

319P. Advanced Seminar in Measurement, Statistics, and Evaluation. Special topics in measurement, statistics, and program evaluation. May be repeated with change of topic. Prerequisite: consent of instructor. [3]

325P. Proseminar in Mental Retardation. (Also listed as Special Education 3250) Variable topics. May be repeated with change in topic. [2]

334P. Psychological Foundations of Education. (Also listed as Education 3110) Psychological theories and research as related to the design and practice of education. Specific consideration of the developmental bases of teaching, learning, and student performance (early childhood through adult); individual differences in education with particular reference to socioeconomic status, disabling conditions, learning style, and gender; evaluation of learning; classroom and organizational influences on school effectiveness; family-school relations. [3]

336P. Behavioral Pediatrics and Child Health Psychology. Behavioral pediatrics and child health psychology for advanced predoctoral and postdoctoral trainees. Topics include the scope and definition of behavioral pediatrics, measurement of child behavior, children's health beliefs and understanding of illness, theories of psychosomatic illness, immunologic and endocrinologic aspects of stress, compliance, psychological effects of physical illness, families' responses to stress, and psychological intervention strategies. [3]

338P. Family Therapy. Techniques of family and marital therapy, integrating cognitive-behavioral, systemic, and structural approaches. [3]

339P. Advanced Seminar in Educational Psychology . May be repeated with change of topic. [Variable credit: 1–3]

340P. Psychopathology. The major forms of psychopathology: child, adolescent, and adult. Recent research, classification systems, and developmental variables affecting psychopathology. [3]

343P. Psychological Assessment. A general introduction to clinical assessment, with a particular emphasis on children. The major purpose is to familiarize students with the theoretical issues and psychometric properties of several different methods of assessment including objective and projective personality measures, behavior checklists, behavioral observation, and clinical interviews. Required before taking practica. Prerequisite: consent of instructor. [3]

344P. Psychological Intervention: Individual Focus. Theories and research in psychotherapy. Some initial skill training will be provided. Required before taking practica. Prerequisite: 343P. [Variable credit: 1–3]

345P. Seminar in Systems and Community Psychology. Systems and social ecology theory, and community applications of systems psychology. [3]

347P. Advanced Seminar in Community Psychology . May be repeated with change of topic. [Variable credit: 1–3]

349P. Advanced Seminar in Clinical Psychology. May be repeated with change of topic. [3]

350P. Human Learning. Overview of the major experimental approaches to human learning, with an emphasis on the limitations/contributions of each paradigm. [3]

352P. Human Cognition. Current research and theory in cognitive psychology. Emphasis on memory, perception, and language. Some applications of cognitive theories are explored. [3]

353P. Advanced Seminar: Cognitive Studies. Special topics in cognitive studies. May be repeated with change of topic. [3]

354P. Language and Text Processing. Fundamental survey course in language, required for students in the cognitive studies Ph.D. program. Focuses on the psychological and linguistic aspects of sentence and discourse processing, with some attention to computer simulations. Class sessions are generally a combination of lecture material and student presentation. [3]

355P. Sociobiology. Evolutionary models of social behavior across a wide range of species. Specific topics include: kin selection and inclusive fitness; space utilization; parent-infant interactions; aggression; kin recognition; mate choice and reproductive strategies and communication. [3]

357P. Seminar in Behavioral Biology. Selected topics in behavioral biology—e.g., ethology. Content varies according to student needs and interests. May be repeated. [3]

360P. Developmental Psychology. Central issues, theories, and methods. [3]

361P. Seminar in Cognitive Development. Major theoretical and conceptual issues in cognitive development. Emphasis in current research topics like memory development, reading, conceptual development, semantic development, problem solving, and reasoning. Recommended background: 352P and/or 360P. [3]

363P. Seminar in Social and Personality Development. Development of personality and social processes, with emphasis on methods of inquiry. Trait theory, socialization processes, origins of gender differences, cultural differences in childbearing practices, experimental and observational methods in developmental research, and development of motivational systems. [3]

368P. Advanced Seminar in Developmental Psychology. May be repeated with a change of topic. [3]

369P. Master's Thesis Research. Open only to candidates for the master of science degree engaged in thesis research and writing. Consent of major professor required. [Variable credit: 1–6]

370P. Theories of Personality. Psychoanalytic theories, phenomenological theories, and behavioral theories. The process of theory development and the interaction of theory and empirical confirmation. [3]

375P. Social Psychology. Emphasis on current theory and research. [3]

378P. Current Research in Social Psychology. A seminar on the current state of the field of social psychology as explored through critical analysis of recent journal articles. May be repeated. [3]

379P. Advanced Seminar in Personality and Social Psychology. May be repeated with change of topic. [Variable credit: 1–3]

380P. Assessment of Intellectual Functioning. The measurement of intellectual functioning; effective report writing; skills associated with test administration and scoring and the development of intelligence over the life span. Behavioral and vocational correlates of intelligence and competence. Methods for psychoeducational remediation. [3]

381P. Cognitive Theories of Mathematical Learning. (Also listed as MTED 3810.) Examines the research literature on mathematical learning at the elementary and secondary levels. Considers both the epistemological assumptions and implications of information-processing theories, situated cognition theories, activity theory, and constructivism. [3]

382P. Assessment of Personality. Assessment of children and adolescents in varied contexts using personality tests in practical settings, with emphasis on projective testing and the clinical method. Interpretation and report writing. Prerequisite: consent of instructor. [3]

384P. Intervention: Basic Issues. Critical analysis of intervention through examination of the historical, philosophical, political, economic, social, ethical, and value issues that underlie intervention efforts by behavioral and social scientists. [3]

386P. Psychological Intervention with Children. Various intervention approaches with children, including parent training, behavior therapy, group therapy, psychopharmacological intervention, individual psychotherapy, cognitive behavioral intervention, psychoanalytic play therapy, and residential treatment. [3]

389P. Seminar on Psychological Issues and Ethics. Emerging professional and ethical issues confronting psychologists engaged in research or practice. [1]

390P. Clinical Applications and Practicum I. This two-semester sequence is required for doctoral students in clinical psychology. The sequence involves applications of theoretical principles of behavior change in clinical settings. Didactic meetings will integrate the empirical and theoretical literatures with problems in clinical application. Students will participate in clinical practice (assessment and intervention) under program faculty supervision. Prerequisite: psychopathology, clinical assessment, and intervention, as well as consent of instructor. [1–3]

391P. Clinical Applications and Practicum II. This two-semester sequence is required for doctoral students in clinical psychology. The sequence involves advanced application of theoretical principles of behavior change in clinical settings. Students will participate in clinical practice (assessment and intervention) under the joint supervision of program faculty and adjunct faculty in community settings. Prerequisite: 390P. [1–3]

392P. Clinical Psychology Internship. Required of all Ph.D. students in the clinical pr ogram. Specialty rotations, generalized training, didactic instruction, and supervised r esearch are offered during one full year of clinical experience in an academic clinical setting or similar internship facility accredited by the American Psychological Association (AP A). Credit hours: students register for *zero hours* to reflect full-time involvement in supervised clinical psychology internship. Grading is on a Pass/Fail basis. [0]

396P. Special Topics in Psychology. May be repeated with change of topic. [V ariable credit: 1–4]

397P. Readings and Research in Psychology. Individual programs of reading or empirical research in psychology . Prerequisite: consent of faculty supervisor . May be r epeated. [Variable credit: 1–3]

399P. Ph.D. Dissertation Research. [Variable credit]

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Religion

CHAIR John S. McClure
DIRECTOR OF GRADUATE STUDIES AND ASSISTANT DEAN James P. Byrd
PROFESSORS EMERITI/A James Barr, David G. Buttrick, Edward Farley, H. Jackson Forstman, Frank Gulley Jr., Charles H. Hambrick, Walter Harrelson, Peter C. Hodgson, Joseph C. Hough Jr., Dale A. Johnson, Sallie McFague, Lou Silberman, Eugene TeSelle, Richard M. Zaner
PROFESSORS Ellen T. Armour, Lewis V. Baldwin, J. Patout Burns, Larry Churchill, Dennis C. Dickerson, Paul R. Dokecki, Volney P. Gay, Lenn E. Goodman, Thomas A. Gregor, James Hudnut-Beumler, Robin M. Jensen, Douglas A. Knight, Amy-Jill Levine, John S. McClure, M. Douglas Meeks, Bonnie J. Miller-McLemore, Daniel M. Patte, Jack M. Sasson, Fernando F. Segovia, David J. Wasserstein, D. Don Welch Jr.
ASSOCIATE PROFESSORS Victor Anderson, Gregory F. Barz, Brad R. Braxton, Beth Ann Conklin, Paul J. DeHart, Idit Dobbs-Weinstein, William Franke, Kathy L. Gaca, Joel F. Harrington, Richard King, Thomas McGinn
ASSISTANT PROFESSORS Annalisa Azzoni, James P. Byrd, Kathleen Flake, Jay Geller, William J. Hook, Alice Wells Hunt, Susan Hylen, Paul C. H. Lim, Herbert Marbury, Barbara McClure, Richard McGregor, Ted A. Smith, Melissa Snarr, John J. Thatamanil, Martina Urban, Gay House Welch

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

STUDENTS may be admitted upon graduation fr om an accredited college with a baccalaureate degree or from an accredited seminary or graduate school with a post-baccalaureate degree. Ordinarily, students with only the baccalaureate degree are admitted to the M.A. pr ogram. Successful completion of the latter provides a foundation for doctoral studies but does not guarantee admission to the Ph.D. pr ogram. Students with an M.Div .,

M.T.S., or M.A. degree may be admitted directly to the Ph.D. program. Applicants with the B.A. degree are advised to consider not only the M.A. program in the Graduate School, but also the two-year M.T.S. program in the Divinity School of Vanderbilt University as preparation for Ph.D. work.

Degree programs are offered in ethics and society, Hebrew Bible, historical studies, history and critical theories of religion, homiletics and liturgics, Jewish studies (M.A. only at present), New Testament, religion and personality, and theological studies. Interdisciplinary studies, both within religion and in other areas of knowledge, are encouraged. The study of religion is pursued both as a critical, humanistic discipline, employing a variety of methodological perspectives, and as a theological discipline, interpreting religions and their historical, theological, and ethical heritage.

Master of Arts

The M.A. program is designed to enable students to explore personal interests or vocational options, to acquire a background for teaching at the secondary level, or to attain a foundation for further studies at the doctoral level. A total of 24 credit hours and a thesis are required for the first three programs described below, while the final two programs have special requirements.

1. *Specialty M.A.* This program involves a concentration in one of the subspecialties of religious study. Students will select a major of at least 12 hours and a minor of at least 6 hours from the following areas: ethics and society, Hebrew Bible, historical studies, history and critical theories of religion, homiletics and liturgics, Jewish studies, New Testament, religion and personality, and theological studies. The remaining hours may be chosen from the above areas or from other departments of the Graduate School.

2. *General M.A.* This program provides an opportunity for a broad study of religion guided by individual interests and goals. Students may choose to concentrate on a critical study of the history and literature of the Jewish, Christian, or another religion, or they may be primarily interested in gaining a more general understanding of the phenomenon of religion and its role in human life and experience. They will normally be expected to engage in more than one of the various methods of inquiry that have figured in religious studies, such as the human sciences, historical and literary studies, philosophical descriptions and analyses, and theological and ethical interpretations. They will develop with their advisers an integrated program of courses.

3. *Cross-Disciplinary M.A.* This program, to which students are admitted under exceptional circumstances, provides an opportunity for students to relate one of the subspecialties of religious studies to an appropriate supportive discipline. Normally, 12 hours are taken in one of the areas listed under the specialty M.A., with the remaining hours taken in another department of the Graduate School. The thesis will attempt to integrate the methods and subject matters of the two disciplines in relation to a chosen problem.

4. *Non-thesis M.A.* The non-thesis M.A., designed especially for Ph.D. students who elect not to complete the Ph.D. program, may be received by students who have demonstrated reading knowledge in at least one foreign language at the level required for the M.A. degree; have completed 48 semester hours of formal, graded course work at the graduate level, including at least 24 hours at Vanderbilt; and do not seek candidacy for the Ph.D. degree.

5. *Master's Degree in Passing.* Ph.D. candidates may earn the M.A. degree upon completion of at least 42 hours of graduate study, satisfaction of the language requirements, passing of the Ph.D. qualifying exam, and approval of the dissertation proposal according to the GDR guidelines.

All M.A. candidates demonstrate reading competence in one foreign language, ancient or modern, as may be required in the program or area of concentration. The student may satisfy this requirement by performing satisfactorily in the departmentally administered Ph.D. language examination, taking and passing with the grade of *B*+ or higher a Vanderbilt University course designed specifically to teach graduate students to use the language in research, or by presenting an acceptable record of at least 12 hours (or its equivalent) in a language. Candidates specializing in Hebrew Bible or New Testament are expected to work with the original texts in Hebrew or Greek. Students designating Greek or Hebrew as the foreign language may not count introductory courses in these languages toward the requisite 24 hours for the degree.

Joint J.D.–M.A. Program. Students who have been admitted to both the Law School and the Graduate School may work toward the J.D. and the M.A. in religion concurrently. Six hours of religion credits will be accepted toward the J.D. degree, and 6 hours of law credits will be accepted toward the M.A. in religion. The joint program normally takes four years. For further information, write to the chair of the Graduate Department of Religion.

Doctor of Philosophy

Ph.D. programs are currently available in the following areas of major concentration: ethics and society, Hebrew Bible, historical studies, history and critical theories of religion, homiletics and liturgics, New Testament, religion and personality, and theological studies.

Candidates for the Ph.D. degree must demonstrate a reading knowledge of two modern languages of research. Each of the areas of major concentration specifies which languages are acceptable for its students. The requirement for modern languages may be satisfied by taking and passing with the grade of *B*+ or higher a Vanderbilt University course designed specifically to teach graduate students to use the language in research, or by passing the departmental reading examination. Beyond this department-wide requirement, in biblical studies a knowledge of Hebrew or Greek is required, and in some areas of historical studies a knowledge of Latin or Greek is required. Students should be prepared to learn such other languages, ancient and modern, as may appear requisite for scholarly interests. Students should check with their area directors concerning specific requirements.

Carpenter Certificate

Students enrolled full-time in the M.A. or Ph.D. program may earn a graduate certificate in Religion, Gender, and Sexuality. Interested students should contact the Carpenter Program director, Amy-Jill Levine.

I. The Study and Teaching of Religion

3601. The Study of Religion. Required of entering Ph.D. students. Discussion of such topics as the methods, diversities, connections, purposes, and contexts of religious studies. [3] King.

3620. Practicum in the Teaching of Religion. Preparation for the teaching of courses in religious or theological studies through discussion of case studies, issues, and problems. Required for all graduate students of religion during the semester in which they are serving as teaching fellows. Can be repeated. Not open to others except by permission of instructor. [0] Staff.

3690. Master's Thesis Research. [0]

3990. Ph.D. Dissertation Research. [0–12]

II. Languages and Methodologies

2210. Introductory Arabic I. Arabic script, elements of grammar, pronunciation, reading, writing, and elementary conversation. Experience Arabic culture and life through traditional and contemporary texts and audio-visual materials. [5] H. Elkhateeb-Musharraf.

2211. Introductory Arabic II. A continuation of Arabic I, with a greater emphasis on everyday conversation, grammar, reading, writing. Prerequisite: Arabic I or equivalent credit by examination. [5] H. Elkhateeb-Musharraf.

2500–2501. Elementary Biblical Hebrew. A two-semester course of study leading to a reading knowledge of the Hebrew Bible. Open for credit to M.A. students only. [3–3] Staff.

2514–2515. Elementary Modern Hebrew. Introduction to alphabet, the basics of grammar, and elementary conversation. Spring: greater emphasis on conversation and grammar. Open for credit to M.A. students only. [3–3] Staff.

2600–2601. Beginning Koiné Greek. A two-semester course of study leading to a knowledge of the New Testament. Open for credit to M.A. students only. [3–3] Staff.

3101. Readings in Biblical Hebrew. A reading course in selected texts of the Hebrew Bible for students who have taken 2500–2501 or its equivalent. [1] Staff.

3102–3103. Intermediate Modern Hebrew. Modern Hebrew reading, conversation, and advanced grammar. Spring: greater emphasis on reading and writing. Prerequisite: one year of Modern Hebrew or its equivalent. [3–3] Staff.

3180. Readings in the Greek New Testament. A reading course in selected New Testament texts for students who have taken 2600–2601 or its equivalent. [1] Staff.

3801. The Megillot. Five scrolls, each a different genre of literature, are customarily read in synagogues throughout the year: Esther (Purim), Song of Songs (Passover), Ruth (Shavuot), Ecclesiastes (Sukkot), and Lamentations (Ninth of Av). We sample them and discuss them within the context of ancient Near Eastern literature. For students with at least one year of Hebrew. [3] J. Sasson.

3802. Exegesis Seminar. Study of the principles, methods, and tools used in the critical study of the Hebrew Bible, including textual, historical-critical, ideological, literary, and other exegetical methods. [3] Hunt.

3810. West Semitic Inscriptions. Readings in selected Phoenician, Aramaic, and Punic texts, with relevant grammatical analysis. Knowledge of Hebrew required. [3] Sasson.

3814. Intermediate Hebrew. Designed for students who have completed an elementary course in Hebrew and need more work in the areas of grammar, syntax, and reading of Hebrew texts. [3]

3815. Ugaritic. Elements of Ugaritic grammar, with reading in selected texts. Prerequisite: Elementary Biblical Hebrew. [3] Knight.

3816. Advanced Hebrew. Reading of selections from the Hebrew Bible, with emphasis on syntax and text criticism. Prerequisite: Elementary Biblical Hebrew. [3] Knight.

3818. Aramaic. Vocabulary, forms, and syntax of Aramaic through reading of the Aramaic sections of Daniel and Ezra and of specimens of material from the Elephantine papyri, the Targums, etc. Prerequisite: 3816. [3] Azzoni.

3821. Syriac. Vocabulary, forms, and syntax of classical Syriac, with readings from the Peshitta, Ephraem Syrus, etc. [3] (Not currently offered)

3824. Elementary Ethiopic (Ge'ez). A one-semester introduction to the grammar and syntax of classic Ethiopic (Ge'ez) for students who want to make use of the Ge'ez Bible. [3]

3826. Advanced New Testament Greek. Knowledge of Greek required. [3]

3827. Readings in Hellenistic Greek. Reading, translation, and grammatical analysis of select Greek texts from the Hellenistic period. Selections from the Septuagint, the New Testament, Josephus, Philo, the apostolic fathers, and the papyri. Emphasis on problems of translation and grammar, with special emphasis on the divergence of the Koiné from classical norms and the influence of the Semitic languages. [3]

3831. Akkadian I. Elements of Akkadian (Assyro-Babylonian) grammar, with reading in selected texts. Consent of the instructor required. [3] Sasson.

3832. Akkadian II. Reading in selected historical, mythical, legal, and epistolary texts. Consent of the instructor required. [3] Sasson.

3837. Seminar: Multidimensional Critical Exegesis. An examination of the interrelations of historical-critical, semio-structural, literary, and social-scientific methodologies as theoretical framework for multidimensional practices of New Testament critical exegesis. Multidimensional exegesis as androcritical, and its relation to feminist, African American, and other advocacy and liberation hermeneutics. Knowledge of Greek required. [3] Patte.

3838. Structuralist Methodologies and the Humanities. A study of structuralist (and semiological) methodologies aimed at preparing the student for the use of structural methods in various disciplines. Structural linguistics, structural anthropology, structuralism and psychology, as well as various semiological literary methodologies presented by specialists in these fields. The computability of some of these procedures, their relationship with information science, and the philosophical implications. [3] Segovia.

3839. Cultural Criticism and the New Testament. An introduction to the paradigm of cultural studies in biblical criticism, with a focus on theoretical orientations, approaches to the text, and interpretations of texts. Previous work in biblical criticism required. [3] Segovia.

III. Ethics and Society

2814. Religion and Society. Examination of religion as a social phenomenon. Explores the writings of classical sociologists (especially Marx, Weber, and Durkheim). Readings in the areas of social theory, cultural analysis, and sociology of religion. Focus on the use of sociological insights toward understanding the relation between religion and Western social life. [3]

2815. Religion and Social Movements. This sociology seminar focuses upon the roles of religious organizations, individuals, and cultures in social-political movements for change; students will become engaged in the interdisciplinary conversations on the contributions and constraints that religious groups provide for social movements. Among the questions students will investigate are: What makes an activist? In what ways do religions provide resources—materially, ideationally, and culturally—for the emergence and maintenance of social movements? And in what ways are religious groups transformed by their interaction with the political process? [3] Snarr.

2816. Contemporary Christian Ethics. There are many approaches to studying Christian Ethics: larger historical survey, close reading of a limited body of material, thematic/issue exploration, etc. In this course, we will do a survey of recent material (published in the last ten years) that spans the denominational configuration of the United States with an emphasis on "mainline" denominations. Thus, we will read Eastern Orthodox, Catholic, Episcopalian, UCC, Lutheran, Presbyterian, Methodist, and Baptist perspectives on theological ethics. [3] Snarr.

2817. Modern Christian Political Thought. Surveying Christian Political Thought from the late nineteenth century to contemporary debates, we will analyze theo-ethical understandings of the relation of Christianity to political life. Some questions the course will focus on are: Is there a necessary and important relationship between Christianity and democracy? What is the role of the public theo-ethicist in political debates? In what ways do various ecclesial and theological assumptions impact the political engagement of the church? Social gospel, Christian Realist, Anabaptist, Liberation, Catholic Social Thought, Feminist, and Fundamentalist approaches will receive particular attention. A theory-practice option for those who want to study the concurrent U.S. campaign season is available. [3] Snarr.

3400. Social Ethics. Focuses on an examination of religious and philosophical traditions that give rise to understandings of justice, duty, rights, and community. Attention paid to how these traditions inform moral judgments and shape the responses of moral communities. Particular examples, such as abortion, poverty, and racism employed to show how different moral traditions issue in social analysis and provide backing for normative moral judgments. [3]

3402. Ethical Issues in the Women's Movement. An examination of some of the central issues concerning women's status in present-day society through a sympathetic, yet critical, reading of key feminist texts. Authors examined include Brownmiller, Daly, Beauvoir, Friedan, Greer, and Jaggar. [3] G. Welch.

3403. Theology and Ethics in America. Explores the philosophical, theological, and ethical legacies of American philosophers and theologians who have significantly influenced theology and ethics in the United States and American public discourse. Students may encounter the traditions of American pragmatism, American Empirical Theology, Theology of the Social Gospel, American Neo-Orthodoxy, and American Public Theology and figures from William James and R. and H. R. Niebuhr to James M. Gustafson. [3] Anderson.

3410. Political Ethics. An examination of the political thought of prominent thinkers in American theological and social ethics. [3] Snarr.

3411. Religion and War in an Age of Terror. Looking at both Christian and Islamic political thought, this course will wrestle with questions such as: When, if ever, is it appropriate to go to war? How has the emergence of "terrorism" as a form of war challenged traditional just

war and pacifist theories? Are there ways in which religion and violence are inherently connected? How have religion and war been linked historically? In what ways do religious worldviews challenge or complement contemporary efforts at peacemaking? [3] Snarr.

3412. Ethics and Society. An intensive examination of particular themes or thinkers in social ethics. [3] Staff.

3413. Ritual and Religious Experience. Four themes that appear in classical and contemporary literature in the social sciences: religion, religious experience, ritual, and symbol. [3]

3414. Seminar: Special Topic in Ethics. Provides a context for moral reflection upon a range of historical and contemporary social issues. Topics may include: The Moral Agent, Comparative Religious Ethics, Issues in Public Policy, Environmental Ethics, and Contemporary Social Problems (racism, violence, education, etc.). [3]

3415. Feminist/Womanist Ethics. Using resources from feminist traditions (womanist, mujerista, Asian, white), the course focuses on some major methodological, theoretical, and policy issues in feminist theological ethics. After tracing the historical development of the field of feminist theological/social ethics, we will analyze how feminists choose/use theo-ethical resources ("malestream" writings/tradition, scriptural sources, experience, women's literature), the impact of varying theoretical frameworks on feminist analysis (economic, post-modern, cultural studies, race theory), major policy foci of feminists (abortion, work-family, sexuality, globalization), whether/how to stay with a "patriarchal" religious tradition. Readings from Christian, post-Christian, pagan, Islamic feminist. [3] Snarr.

3419. Twentieth-Century North Atlantic Ethics. An examination of figures and movements that influenced the discourse on religious ethics in both Europe and North America. Special attention to representatives of History of Religions School (Troltsch, Ott); logical positivism, political theology (Moltmann, Metz, Habermas); neo-orthodox and existential theologies (Brunner, Barth, Buber, Reinhold Niebuhr); as well as ethics influenced by Wittgenstein. [3] Anderson.

3422. African American Political Theology. Examination of the writings, speeches, and other cultural products (literature, films, music) of African Americans in their attempts to give prophetic expression to the politics of race, gender, and class in the North American context. The politics of abolition and reconstruction, the politics of race, and the new cultural politics of difference approached theologically, historically, and critically. [3] Anderson.

3426. Ethics in Technological Society. An examination of moral and ethical issues raised by the many ways in which life is structured and defined by the technological ethos of our economy and culture. Philosophical and theological resources for evaluating the problematic elements of technology will be used to examine issues such as privacy in an electronic society, impacts of computerization on clerical jobs, high technology medical interventions vs. low technology preventative medical treatment. [3] Hook.

3452. Seminar in Medical Ethics. Explores a variety of topics and problems in Medical Ethics. Topics may include: Ethics, Law and Medicine, Health Care Delivery, Euthanasia and end of life decisions, Life before Birth, Issues in Reproductive Technologies, and Genetics and Ethics. [3]

3464. Seminar in Clinical and Research Ethics. An introduction to the central moral themes and issues arising in clinical and research settings configuring ethical understanding. Relevant historical movements in the development of modern medicine, the field of bioethics, and the realm of clinical ethics are explored as well as the contextual complexities associated with attempts to identify, articulate, and clarify the moral frameworks and values present in clinical and research settings. [3] Finder.

3465. Ethics for Human Development Professionals. This course involves a normative evaluation of ethical issues in serving human needs by examining conflicting values within moral dilemmas from a variety of theoretical perspectives and practical criteria. Students will review case studies of moral issues confronting the individual, the family, service organizations, and the general public. [3] Dokecki.

3951. Methods in Ethics. A survey of various methods, styles, and contexts under which moral philosophy has been developed and transmitted in Western thought. Topics treated are classical moral philosophy (Plato, Aristotle, Cicero), Christian sources (Augustine, Thomas Aquinas), modern philosophical ethics (Spinoza, Kant, Mill, and several twentieth century thinkers). [3] Anderson.

3953. Seminar in Sociology of Religion. Explores a number of possible topics in the Sociology of Religion. Topics may focus on classical theorists (Weber, Troeltsch, Durkheim), the study of religious movements, popular religions, rituals and religious Experience, and the application of social scientific research methods for the study of religion. [3]

3956. Philosophical Ethics in the Western Tradition. Major thinkers, movements, and issues in the western philosophical tradition—e.g., the ethical and political thought of Aristotle and Immanuel Kant. [3] Anderson.

3957. Seminar in Advanced Theological Ethics: The Theology and Ethics of Stanley Hauerwas. In this advanced seminar, students will examine the theology and ethics of Stanley Hauerwas, perhaps the most influential North American Christian ethicist and contributor to contemporary discussions on the meaning of the Christian life to contemporary moral questions. [3] Anderson.

3960. Special Topics in Religion. [3]

3961. Special Topics in Religion. [3]

3976. Reading Course in Ethics. [1–3] Staff.

3977. Reading Course in Medical Ethics. May be repeated. [1–3]

IV. Hebrew Bible and Ancient Israel

2503. The Hebrew Bible. The life and thought of ancient Israel, with emphasis on the community's understanding of itself and of its role in history. Concentrates both on problems of historical and literary introduction and on Israelite religious practice and faith. Not available for Ph.D. credit in biblical studies. [3] Marbury.

2513. Biblical Criticism: History and Traditions. Introduction to the resources, methods, and practice of biblical interpretation, with exercises on selected texts from the Hebrew Bible and the New Testament. Knowledge of biblical languages is not required. [3] Staff.

3108. Eighth-Century Prophecy. A study of the prophetic literature against its ancient Near Eastern background; emphasis placed on the eighth-century B.C.E. prophets and on the contemporary significance of their message. [3]

3109. Exilic Prophecy. A study of Hebrew prophecy from the seventh and sixth centuries B.C.E., with emphasis on the prophets Jeremiah, Ezekiel, and Deutero-Isaiah. The work, literature, and thought associated with these great prophets are studied against the background of the events surrounding the Babylonian exile. [3] Knight.

3111. The Pentateuch. A study of the first five books of the Hebrew Bible as the key for understanding Israelite history and theology and as the base point for some of the most critical questions in the study of biblical literature. [3]

3112. Apocalyptic. A study of the early Jewish and Christian apocalyptic movements and literature. [3] Knight, Levine.

3113. Wisdom Literature in the Ancient Near East (ANE). Israel's wisdom corpus (Proverbs, Job, Ecclesiastes, Sirach, Wisdom of Solomon) in light of comparable literature from Egypt and Mesopotamia and Aramaic material. Attention to the structure of wisdom thought, to literary forms, and to traditions. [3] Azzoni.

3115. The Psalms. A study of the Book of Psalms in general, along with readings of selected Psalms in Hebrew. The course will include an analysis of the types and setting of the Psalms in the life of Israel, a discussion of the religion of the poems and their poetic form, and a survey of modern scholarship in the area. [3]

3116. Law in Ancient Israel and the Near East. The legal materials in the Pentateuch, their relation to the prophetic movement, and the role of law in ancient Israel's thought and society against the ancient Near Eastern background. [3] Knight.

3117. The Ethics of Ancient Israel. A descriptive study of the ethics of Israel, seeking to understand the effect of religion and history on the Israelites' effort to order their society and to influence moral behavior. Views of humanity, the relationship between the individual and the community, the place of politics in establishing justice, the treatment of socially vulnerable persons, and other topics. Connections drawn to such theological concepts as covenant, righteousness, and wholeness. [3] Knight.

3120. Politics and the Economy in Ancient Israel. The political and economic systems of ancient Israel, with attention to the impact of the centralized monarchic government on the economy of the country. Political processes, rights, and obligations are examined, as well as economic options, stratification, and commercial and property law. Biblical evaluations, especially prophetic critiques of the abuse of power, are explored. [3] Knight.

3122. Themes for Preaching from the Hebrew Bible. Designed to help students identify within the historical, sociological, ideological, and literary frameworks of Hebrew texts relevant themes for preaching in modern settings. [3]

3123. The Book of Exodus. General exegesis of the Book of Exodus, concentrating on the definition of its major themes and purposes. If necessary, additional time may be allotted for those requiring extra work in Hebrew or in textual criticism. [3]

3124. Esther and Ruth. Explores the two books in the Hebrew Bible named for women. Examines Hebrew narrative technique and feminist and postmodern criticism. [3]

3125. Book of Genesis. General exegesis of the Book of Genesis, concentrating on the definition of its major themes and purposes. Hebrew language not required. [3] Sasson.

3127. Cultures of Ancient Near East. A consideration of the cultural and religious milieus of the third and second millennia B.C.E., as they shed light on Biblical origins. [3] Sasson.

3129. Book of Judges. General exegesis of the Book of Judges, concentrating on its major themes, purpose, and narrative techniques. If necessary, additional time may be allotted for those requiring extra work in Hebrew. [3] Sasson.

3130. Book of Jeremiah. General exegesis of the Book of Jeremiah, concentrating on its structure, major themes, purpose, and the history of ancient Judah as it is embedded in the book. [3]

3131. Voices of Women in the Ancient Near East. An introductory examination of the place and portrayal of women in Near Eastern antiquity and in contemporary scholarship, with special consideration of the role genre plays in their representations. [3] Azzoni.

3132. Suffering and Evil in the Hebrew Bible. The way in which, in light of the humiliating experience of the Exile, ancient Israel's experience of suffering as the people of God influenced the shape of its literature and religion. Attention to topics of evil, sin, divine judgment, and suffering—both merited and unmerited. [3]

3133. Book of Job. A study of the book of Job, attending to its literary features, religious themes, internal disputes regarding theodicy, and its relation to other texts from the region. [3] Knight.

3134. The Ideology of Race and Gender in the Hebrew Bible. The extent to which Hebrew scriptures reflect the ethnic, gender, and dualistic attitudes of ancient Hebrew culture. Particular emphasis given to the extent to which, if at all, biblical perspectives on power, election, and authority are to be applied to contemporary society. [3]

3135. Sexuality in the Hebrew Bible and ANE. Explores how various sexual practices (prostitution, homosexuality, heterosexuality, rape, sodomy, incest) are dealt with in the Hebrew Bible and in the larger context of the ANE. [3] Azzoni.

3137. Autobiography and Methodological Criticism. Considerable attention given to reading and discussing texts from across the humanities field where scholars are rethinking objectivity and exploring questions of social location, personal voice, subjectivity, and different inflections of the academic "voice." Aims to helping students experiment with different styles of academic writing and reflection in an effort to find their own voice. For graduate and advanced level students. [3]

3139. Seminar: Book of Amos. This seminar focuses on the meanings and messages of the rhetoric attributed to the Hebrew prophet Amos; the course will raise questions about the Sitz im Leben and the social context that might have given rise to such strident social critique; the seminar will devote ample attention to the stylized presentation of the prophet's voice in Hebrew poetry. Of paramount concern for the discussions will be the junctures where the prophet's rhetoric offers relevant critique for the contemporary world. [3] Marbury.

3142. The Old Testament in Greek. An introduction to all aspects of the Old Testament in Greek: the origins and purpose of the LXX; its translation technique; differences between various books; Origen's *Hexapla;* the later translators Theodotion, Symmachus, and Aquila; contacts through St. Jerome and the Latin Bible; relations with the Dead Sea Scrolls; practical use of the modern editions; practice in use for textual criticism of the Hebrew Bible. Prerequisite: knowledge of Greek, together with at least an elementary knowledge of Hebrew. [3]

3718. The Targums. As an introduction to the Jewish Aramaic translations and interpretations of the Hebrew Bible, the course will familiarize the student with Jewish Literary Aramaic as reflected by the various Targums and examine the different translations of the same biblical passages and different interpretative approaches. [3] Azzoni.

3800. The Dead Sea Scrolls. The materials from Qumran and other locations in the Judean Desert and Jordan Valley, with reference to their contributions to the understanding of Judaism in the period 200 B.C.E. to 100 C.E. and of earliest Christianity. Open to graduate and advanced Divinity students. Prerequisite: Hebrew. [3]

3801. The Megillot. Five scrolls, each a different genre of literature, are customarily read in synagogues throughout the year: Esther (Purim), Song of Songs (Passover), Ruth (Shavuot), Ecclesiastes (Sukkot), and Lamentations (Ninth of Av). We sample them and discuss them

within the context of ancient Near Eastern literature. For students with at least one year of Hebrew. [3] J. Sasson.

3803. Ben Sira with Introduction to Mishnaic Hebrew. Introduction into grammar and vocabulary of Mishnaic Hebrew, with practice in reading and guidance for further study. Reading of selected portions of the Hebrew text of Ben Sira. Emphasis on the experience in reading unpointed Hebrew text of this period, relevance for textual criticism, use of the Greek version, and the place of the book and its theology in the development of Israelite wisdom in general. [3]

3805. Job and Qoheleth. Israelite skepticism, with emphasis on the literary form, thematic coherence, and religious viewpoint of Job and Qoheleth, interpreted within the broad spectrum of Israelite wisdom and consideration of Greek influence. [3]

3806. The Song of Songs. The seminar will involve a rigorous study of the text, analyses of the literature, and inquiry regarding the religious significance and social background of the book and the role of the Song of Songs in the theology of the Hebrew Bible. Students who enroll from the Graduate Department of Religion, as well as students with proficiency in Biblical Hebrew, will have an additional class hour to concentrate on Hebrew. [3] Hunt.

3807. Proverbs. Analysis of the Book of Proverbs, with emphasis upon translation, themes, and literary features and the function of aphorisms and instructions in the ancient Near East. [3]

3808. Seminar: Hebrew Bible. Reading of selected writings and critical reflection on their significance for clarifying the Hebrew Bible. Knowledge of Hebrew required. [3]

3809. The Sociology of Early Israel. The nature of Israelite society, especially in its early periods, through readings in source materials and selected sociological interpretations. [3] Knight.

3811. Modern Interpreters of Ancient Israel. Characteristic approaches to the history and religion of ancient Israel, as seen in selected writings by prominent scholars since the Enlightenment. Attention to the presuppositions of each scholar and to the view of Israel afforded in each study. Reading ability in German desired. Consent of instructor needed for non-Ph.D. students. [3] Knight.

3812. Postexilic Literature and Theology. The literary heritage of ancient Israel from about 538 B.C.E. to 165 B.C.E. Attention to postexilic portions of the book of Isaiah; Haggai; Zechariah; Malachi; I and II Chronicles; Ezra-Nehemiah; Ruth; Esther; Song of Songs; Daniel. The variety of theological perspectives found in this period of Israel's history and the character of religious thought prior to the Maccabean period. [3]

3813. History of Ancient Israel. Examination of the major areas of debate in the reconstruction of the history of ancient Israel and analysis of the important extra-biblical sources that have contributed to the scholarship on ancient Israel's history. The course also will address the roles that ancient Israel's Near Eastern neighbors played in the development of ancient Israel's history. [3] Azzoni.

3822. The Amarna Period. The Amarna Period (sixteenth–twelfth century B.C.E.) has been a focus of research and speculation ever since excavations at the palaces and temples of Anatolia, Canaan, Assyria, and Babylon produced rich archives that illumined in remarkable detail this age, famous for its theological speculation. There were powerful personalities (Thutmoses III, Suppiluliumas I, Ramses II, Aziri, Niqmaddu) who sponsored ferocious classes of empires and cultures but also led powerful drives toward peacemaking. There were enormous commercial undertakings, incredible artistic achievements, and vast spiritual thirst (Akhnaten, Moses). Above all, there were wonderful documents—historical, theological, mythological, epistolary, legal, and belletristic—which will be examined in this course. [3] Sasson.

3823. Literature of the Ancient Near East. Readings in the literature from Egypt, Canaan, and Mesopotamia, with special emphasis on texts relating to the culture, literature, and thought of ancient Israel. [3] Sasson.

3829. The Book of Joshua. An exegesis of the book of Joshua, with special attention paid to literary features, issues of historiography and archaeological evidence, ideological and religious concerns and relation to other texts of the Hebrew Bible, especially the Deuteronomistic History. [3] Knight.

3880.02. Jewish Life in Persian Egypt. The Aramaic documents from the Island of Elephantine offer a unique portrayal of the life of a Jewish community in fifth century Egypt B.C.E. In this seminar, students will explore the historical and cultural implications of the documents in relationship to contemporary Biblical material. [3] Azzoni.

3881. Historiography and Ancient Israel: Chronicles. This course will examine the issues of historiography as they relate to Ancient Israel with a particular focus on the Book of Chronicles; class sessions will focus on the content of Chronicles as well as the sociohistorical contexts and methodical issues. [3] Hunt.

3882. African American Biblical Hermeneutics. Surveys the field of discourse in African American biblical scholarship from its beginnings through the twenty-first century; students will analyze the work of the most prominent hermeneutics; discussions will emphasize the social and ideological currents that have contributed to the development of African American biblical hermeneutics as resistance discourse. [3] Marbury.

3960. Special Topics in Religion. [3]

3961. Special Topics in Religion. [3]

3974. Reading Course in Hebrew Bible. May be repeated. [1–3]

V. Historical Studies

2564. Martin Luther King, Jr., and the Social Roles of Religion. King's role as a religious leader and as an agent of social change, with some attention to the intellectual sources of his thought and social activism. His views concerning the social roles of religion are seen against the background of classical Christian views, late nineteenth-century dissenting traditions, the early twentieth-century American Social Gospel Movement, and the more radical ideas of Malcolm X and Albert B. Cleage, Jr., during the 1960s. Critical evaluations of King are also made in terms of classical Christian views (e.g., Aquinas, Luther, Calvin, Wesley). [3] Baldwin.

2701. The Formation of the Christian Tradition. The expansion of Christianity, the development of doctrine, relationships with the Roman Empire, development of church institutions, and changing modes of Christian life from the second century into the Middle Ages, with emphasis on the periods and themes that are formative of the classical doctrines and institutional patterns. Major purpose of the course is to establish the background for the division of the Western church and the subsequent development of the Roman Catholic and Protestant churches. [3] Burns.

2703. Christianity in the Reformation Era. The setting of the Reformation (c. 1500–1648) and its development. The significant ecclesiastical, theological, and historical issues of the period. Backgrounds and causes; examination of major individuals and ecclesiastical patterns. An understanding and interpretation of the events. Major theological documents and questions of continuing historical interest that have come out of the Reformation. [3]

2704. Modern European Christianity. Institutional and intellectual developments in European Christianity between the mid-seventeenth and the twentieth centuries. Major personalities and movements of this period. Political, social, cultural, and philosophical developments that influenced Christian existence during this time. [3]

2706. The History of Christian Liturgy. As an introduction to the origins and development of Christian worship and rituals from 100 to 1600 C.E., the course will encourage students to explore the underlying structures of different worship practices as well as the function of rituals in various times and places. [3] Jensen.

2750. The History of Religion in America. The history of the religions in America beginning with colonial religious experiments in the New World. Examines American "church history" as well as the influence of non-Christian religions in American culture. [3] Flake.

2857. Baptist History and Polity. Investigates the origins, development, and theological positions throughout the history of the Baptist tradition and examines current trends in the tradition's polity. [3] Byrd.

3191. The History of the United Methodist Tradition. The history of United Methodism from its rise in England in the eighteenth century to the present. Forces that have shaped the movement and its impact on its own culture. Consideration of John Wesley and English Methodism (to 1790). Examination of Methodism on the American scene. [3] Meeks.

3192. Theology in the United Methodist Tradition. The history of theology in the United Methodist tradition, beginning with John Wesley and the rise of English Methodism in the eighteenth century. The major doctrinal concerns that have characterized Methodism historically and its position on several social concerns. The English scene, concluding with the death of John Wesley in 1791. The American theological tradition. [3] Meeks.

3200. Puritanism. Its rise, development, and effects, in England and America. Theology, worship, and political and social life and thought. Readings in Puritans and their interpreters. [3] Byrd.

3202. History of Christian Worship. Catholic and Protestant. Attention to the nature and principles of worship, the primitive tradition, Eastern rites, the Roman Mass, Protestant forms, and modern tendencies. [3]

3204. Religious Life in Nineteenth-Century England. The historical background of modern religious consciousness, as illustrated in Evangelicalism, the Oxford Movement, Christian Socialism, Methodism, Roman Catholicism, and other religious groups. The influence of culture, intellectual currents, and politics on religious life and thought. [3]

3207. Themes in American Christianity: Apocalypticism. Explores the apocalyptic and millennial theologies in America from the colonial period to the present. Particular attention will be given to apocalyptic and millennial ideas in relation to social and political crises in American history. [3] Byrd.

3208. Theology of Martin Luther. Explores the basic shape of Luther's thought. Particular emphasis on the systematic interconnections of the doctrines of God, Christ, scripture, the church, and civil society, based on their relation to the central themes of justification and faith. Readings from a variety of texts in different genres. [3] DeHart.

3209. Calvin's Institutes. An examination of Calvin's great treatise and its major topics: creation, providence, and predestination; Christology and anthropology; interrelation of justification and sanctification; the sacraments; the Church and civil society. Focus on close reading of the text and its topical organization, as well as reflection on the basic issues raised by Calvin's thoughts as a whole. [3] DeHart.

3211. Roman Catholicism: French Revolution to Vatican II. Studies in modern Catholic history in Europe and America. Such topics as institutional and intellectual developments, church-state issues, and the relation between religion and culture. [3]

3212. Jesus in Moder n America. The period from 1880 to 2000 featur ed a high level of American cultural interest in Jesus of Nazareth. More books were produced on Jesus during this period than on any other biblical figure. Through various modes of cultural production—plays, novels, movies, biblical commentaries, theologies, and moral essays —Americans depicted Jesus to meet their needs and conceptions of who this man was and what he r epresented for their congregations. Students will examine a wide range of "American Jesuses." [3] Hudnut-Beumler.

3213. Women and Religion in England. The history of the engagement of women and religion in British histor y from the Refor mation to the pr esent. Perceptions of womanhood, debates concerning the religious foundations of such perceptions, and the way in which the arguments are used. Contributions to the subject of such diverse r eligious movements as the Quakers, the Evangelical revival, and the Oxford Movement. [3]

3214. Women and Religion in America. The role of women in American r eligious history. Topics include patterns of women's ministries, religious perceptions found in different movements or gr oups, contrasting experiences of women in various r eligious traditions, and issues of historical interpretation. [3]

3215. History and Theology in the Christian Chur ch, Disciples of Christ. Study of the Disciples' origins and developments with par ticular emphasis on polity and cur rent issues confronting the church. [3] M. Miller-McLemore.

3216. Sources of American Religious History. An introduction to primary sources of American religion and religious historiography, including works fr om such representative figures as Jonathan Edwar ds, Thomas Paine, Charles Finney , Emerson, Joseph Smith, Fr ederick Douglass, Walter Rauschenbush, Mary Baker Eddy, and Richard Niebuhr. [3] Flake.

3217. Church and State in American History. A study of the complex historical r elationship between church and state in the United States. Particular attention is given to Colonial notions of biblical covenant and social contract; definitions of "religion" employed in American constitutional history; the design of nineteenth-centur y denominationalism and its influence on r eligious liberty; and the effects of pluralism on the shape and public expression of religion in the twentieth century. [3] Flake.

3218. The Bible in American Religion (1800–1950). Students will explore the use of the Bible by American religious communities and their r esponses to scholarly investigation of biblical authorship and authority. Emphasis will be placed on the developments in the late nineteenth and twentieth centuries that contributed to the fundamentalist-moder nist crisis in a variety of Protestant churches. [3] Flake.

3219. Seminar: The Public Chur ch in America. Explores the histor y and cultural context of the practice of ministry in American public life, as manifested in the church, the nation, and the academy. Emphasis placed on identifying the agenda and strategies for public theology in the twentieth century and plotting their trajectories for the twenty-first century. [3] Flake.

3220. Material History in American Religion. Enables students to become familiar with the use of non-textual sources to help recover the historical record, and aid in the interpretation, of people and movements in American religious history. The first half of the seminar will consist of analysis of exemplary techniques for reading the material culture and evidence of the religious past. The second half will consist of hands-on fieldwork and interpr etation of aspects of American r eligion such as dr ess, architecture, food ways, rituals, money practices, visual imagery, music, and the use of time. [3] Hudnut-Beumler.

3221. The Birth of Modern American Protestantism, 1870–1925. A review of scholarly texts related to the history of American Protestantism from the Civil War through the Progressive Era. Particular emphasis placed on the effect of science, higher criticism, professionalism, and socialism on establishment Protestantism's theology and organization. [3] Flake.

3222. Christian Mysticism. Dealing with the development of Christian practices of religious training and purification, and with the techniques of prayer for which they were undertaken, during the first six centuries. Reading and discussion of primary materials in order to discover the changing presuppositions and objectives of the practitioners. [3] Burns.

3224. Doctrine of the Savior. Study of the development of the Christian doctrine of Jesus Christ as divine and human, beginning with the New Testament, moving through the conflict over the process of salvation in the church councils, and culminating in medieval redemption theory. [3] Burns.

3226. Popular Religion. An examination of informal and unofficial practices, beliefs, and styles of religious expression that often stand in contrast or opposition to more formal ecclesiastical structures. Employs several approaches to the subject and treats examples from the seventeenth century to the present in Europe and America. [3]

3227. The Evangelical Movement in America. An examination of evangelical traditions from the colonial period to their present manifestations in twentieth century America, with some attention to the European background. Special attention is devoted to debates concerning the authority and inerrancy of scripture, theology, church-state relations, the role of the Christian in society, education, the relationship between science and religion, the church and racism, the moral character of America, and other areas of cultural cleavage. Cultural conflict or "wars of faith" between conservative black and white Christians studied in terms of their historical significance and political implications. [3] Baldwin.

3228. Catholicism since Vatican II. The Second Vatican Council has become a watermark in the Catholic Church's self-understanding (before Vatican II/after Vatican II). Examination of the last fifty years of Catholicism's history and their impact on various theological issues for the church today. [3] Burns.

3229. Seminar in Wesleyan Theology. The development of Wesley's doctrines of God, grace, and sanctification and their contribution to ecumenical theology. [3] Meeks.

3230. Religion and War in American History. An examination of complex interactions between religion and war in American history. Considers the various functions of religion in social and political crises, contrasting theological interpretations of violence, and the religious construction of national identity through warfare. [3] Byrd.

3232. The Long Reformation in Britain and America. (Also listed as History 317) How protestantism was imposed from above, received in the pew, and negotiated across the gap between the two, during the century and a half following the Reformation in England, Scotland, Anglo-Ireland, the Gaidhealtachd, and the British American colonies. Readings in anthropology of religion and of ritual supplement those in recent secondary historical literature, with a sampling of primary sources including spiritual autobiographies, diaries, church court records, and sermons. Each participant will produce a short work of original research in primary materials. [3]

3233. Theology in America, 1600–1850. Theology in America from the arrival of the Puritans through the Revolutionary period was a complex mixture of academic doctrines and popular beliefs. The scope of theological ideas extended beyond religious institutions to influence cultural patterns and social issues such as war, slavery, religious persecution, and the nature of citizenship. This intermediate-level seminar examines various theologies in

America, including an examination of key theologians (br oadly considered) and important themes and traditions, including the Refor med Tradition, Antinomianism, political theolo - gies, revivalism, and Deism. [3] Byrd.

3235. Twentieth-Century African American Religious History. Examines the rise of Pentecostalism, the spread of the gospel blues, how urbanization and industrialization affected black churches, the pivotal role of religion in the civil rights movement, relationship between black power and black theology, the changing roles of women in religious institutions, and the impact of post-denominationalism. [3] Dickerson.

3238. The Economy of Salvation. The elements of a theological system must fit together into a coherent explanation of the original human condition, the divine intervention in Christ, and the fullness of the Kingdom of God. Considers the interrelation of theories of sin, grace, salvation, church, and sacraments in representative Patristic theologies, including primary texts from Irenaeus, Origen, Gregory of Nyssa, and Augustine. [3] Burns.

3239. Roots of American Evangelicalism, 1770–1879. A study of the history, organizational forms, and beliefs of evangelical Christianity as it developed in America from the late colonial period through the Civil War. Particular emphasis placed on the exchange of religious ideas between Britain and America; revivalism as both a technique and a movement; source of reaction against religious enthusiasm; the South as a distinct cultural region; and the reciprocal influence of slavery and religion. [3] Flake.

3240. The Theology of Jonathan Edwar ds. Edwards' thought with r eference to the Reformed theological tradition, the Enlightenment, and the r eligious ethos of colonial New England, focusing on Edwards' writings. [3] Byrd.

3249. Seminar: Colonial American Religious History . From 1492 through the American Revolution, the Western Hemisphere saw the impor tation of a wide range of African and European religious practices and interaction with indigenous peoples who also observed a wide range of religions. Examines the primary and secondary literature about American religion in the colonial era, with special attention to the pr ocesses of colonization, r eligious competition, differentiation, and innovation. [3] Hudnut-Beumler.

3250. Seminar in Church History. Variable topics. [3]

3251. The Historiography of American Religion. This course focuses on the major important interpretive accounts of the history of American Religion. The course is designed especially for graduate students who intend to specialize within, or take a doctoral exam on, the field of American religious and church history, key problems and significant monographs in the field. [3] Hudnut-Beumler, Byrd, Flake.

3254. Seminar: American Religious Innovation. The rise and development of new religious movements in nineteenth- and twentieth-century America. Emphasizes the following themes: utopian, restorationist, and social reform movements in relation to American primitivism and political orders; the role of text and ritual in creating and maintaining religious order and community; and the problematic of the sociological categories "sect" and "cult." [3] Flake.

3261. Baptism and Eucharist in Ancient Medieval Christianity . The development of the practice and the theory of the Christian ritual of baptism and eucharist is considered. Readings include descriptions and explanations of the rituals, as well as primar y texts that discuss their significance and role in the Christian Church. [3] Burns.

3269. Eucharistic Faith and Practice. *See description under Homiletics and Liturgics.*

3538. The Black Church in America. The development of the black chur ch from the late 18th century to present. Major attention to black denominationalism, church leadership, and

the involvement of the church in the social, cultural, intellectual, political, and economic areas of African American life. [3] Baldwin.

3852. Slave Thought. Students will examine the sources and content of African American slave thought by exploring the themes of God, Jesus Christ, history, the human condition, death and the afterlife, salvation, morality, ethics, Scriptures, and the role of religion in society. Attention will be directed to the sacred world of African American slaves as revealed in narratives, tales, songs, sermons, Works Progress Administration interviews, myths, aphorisms, proverbs, and magical folk beliefs. Students in the M.Div. degree program may apply this course to the requirement in African American, race, and class studies. [3] Baldwin.

3853. Graduate Seminar in Church History. Themes, issues, and approaches that have received attention in recent historical scholarship. [3]

3854. The Theology of Augustine. Development of Augustine's thought, seen against the background of philosophical currents, biblical interpretation, social and political events, and doctrinal controversies in his time. All readings available in English translation. [3] Burns.

3856. Seminar in Patristic Thought. The formation of the Christian tradition as reflected in the writings of Greek "fathers, doctors, and ecclesiastical writers," women included. [3] Buns.

3858. Thomas Aquinas. Aquinas's major theological and philosophical assertions, his conception of the two disciplines and their relationships. All readings available in English translation. [3] Burns.

3960. Special Topic: Religion and the Civil Rights Movement. [3] Dickerson.

3961. Special Topics in Religion. [3]

3978. Reading Course in European Church History. May be repeated. [1–3] Staff.

3979. Reading Course in American Church History. May be repeated. [1–3] Staff.

3980. Reading Course in Early Church History. May be repeated. [1–3] Staff.

3981. Reading Course in Historical Theology. [1–3] Staff.

3988. Reading Course in Modern European Church History. May be repeated. [1–3] Staff.

3991. Reading Course in Reformation History. [1–3] Staff.

Latin 313. Seminar: Classical Latin Prose. [3] McGinn.

VI. History and Critical Theories of Religion

2502. Aspects of World Religiosity. An introduction to the diverse modes and manners of world religiosity and to their study. Explores some of the primary forms of human religious practice through encounters with a variety of primary and secondary sources drawn from around the world. The student will come to appreciate the variety and complexity by which homo religiosus (the human defined by religiosity) makes it through the day (and night). [3] Geller.

2505. Religious Autobiography. Considers the genre of autobiography and the roles of memory and belief in constructing narrative; students will read from the classics of Christian, Jewish, and Native American autobiographies, as well as from other religious traditions, to determine how race, class, gender, and sexuality affect the portrayal of religious experiences. [3] D. Sasson.

2567. Music and Religion. An investigation into the many ways in which religion and music contribute to community formation throughout the world. Topics include music's interdependent relationship with religious texts, religious performance, trance, sacrifice, and folk origins. [3] Barz.

3128. Jewish Messianism. [3] *See description under Jewish Studies.*

3156. Jewish and Christian Self-Definition. [3] *See description under New Testament and Early Christianity.*

3225. Ancient Origins of Religious Conflict in the Middle East. (Also listed as Classical Studies 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] Drews, Wiltshire.

3303. Religious Literature in Contemporary Contexts. A wealth of literature that describes religious experience has been published during the past decade. This course will investigate writing from a variety of religious traditions, including Protestant, Catholic, Jewish, Buddhist, and Muslim. Of prime concern will be how the authors recall experiences in past communities, shape alternative practices, and construct new literary forms through which to tell their stories. We will pay close attention to how gender, race, ethnicity, sexuality, and social class influence how religion is experienced. The course will require several short response papers and one longer critical paper. [3] D. Sasson.

3304. Rabbinic Thought and Theology. [3] *See description under Jewish Studies.*

3309. Gender, Theology, and the Religious Imagination. Provides students the opportunities for exploring the influences of gender on Western theological discourse and the human religious imagination. Particular emphasis will be placed on naming the influences of gender on theological understandings of self, world, and God. Emphasis also will be placed on exploring the ways in which religious experience and community reflect gendered priorities. [3]

3311. Modern Critics of Religion. [3] *See description under Theology.*

3500. What is Religion? The ways of studying religion and the understandings of religion that lie behind these approaches. Resources drawn from contemporary scholars and from the world's religions as interpreted by members of the department. [3]

3501. Judaism in New Testament Times. [3] *See description under Jewish Studies.*

3502. Antisemitism and Jewish Identity. [3] *See description under Jewish Studies.*

3503. The Jewish Heritage. [3] *See description under Jewish Studies.*

3505. Jewish Ethics. [3] *See description under Jewish Studies.*

3509. Introduction to the History and Critical Theories of Religion. Overview of the major thinkers and critical writings that have defined the scientific and critical study of religion. [3] McGregor.

3511. Zen Buddhism. 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]

3512. Buddhist Traditions. The thought, practice, and history of Buddhism from its beginnings in India, through the development of its Theravada, Mahayana, and Vajrayana traditions, to its present status in East and Southeast Asia. [3] King.

3514. Native American Religious Traditions. Religious and value meanings embedded in selected Native American religious traditions. Differences between the dominant western world view and Native American world views and sensibilities. Comparative study of the aesthetic, symbolic, and existential dimensions of these traditions with those of other religious traditions elucidates the characteristics of the experiences of reality found in Native American religions. [3]

3515. Women in Buddhist Traditions. Exploring Buddhist traditions through the contributions and concerns of women in various cultural contexts (India, Sri Lanka, Thailand, China, Japan, and North America) and time periods (ancient and modern). Critical analysis of practices, texts, and hermeneutical schemes that foster divergent images of women. [3]

3517. Mysticism in Islam. A survey of the origins and development of Islamic mysticism, the rise of asceticism, the development of the Sufi orders, the gradual systematization of Sufi teachings, and modern forms of Sufism. The spread of Islamic mysticism was primarily due to the teachings of great thinkers such as Ibn Arabi, Rabi'a, al-Hallaj, Rumi, al-Ghazali, and others. No prior knowledge of Islam is required. [3] McGregor.

3518. The Qur'an and the Tradition of Interpretation. This course will focus upon the Qur'an and the Islamic tradition of interpretation through a critical examination of the treatment of the biblical prophets, Jesus, and Satan. Interpretations will be drawn from the earliest period to the modern era. Rationalist, dogmatic, Shi'i, and mystical schools of interpretation will be discussed. [3] McGregor.

3519. East Asian Folk Religion. The structure and function of religious beliefs and practices at the popular level in China, Japan, Korea, Taiwan, and Okinawa. Prerequisite: any course in religious studies, anthropology, or East Asian studies. [3]

3520. Religious Traditions in Japan. The historical developments of various components of Japanese religions, including Shinto, Buddhism, Confucianism, Daoism, Christianity, folk religion, and the contemporary new religions. [3]

3521. Religion and Ethnic Nationalism in the United States. Mythic and ritual character of ethnic nationalism, emphasizing the African American and American Jewish communities. Religious vs. racial identity, the maintenance of group boundaries vs. assimilation, and this world vs. the Promised Land. [3] Baldwin.

3522. Myth, Ritual, and Symbol. Various theories concerning myth and symbol. The specifically religious and humanistic content is sought through the study of a wide variety of myths and symbols in primitive and modern religions. [3] Geller.

3524. The Holocaust: Its Meanings and Implications. [3] *See description under Jewish Studies.*

3525. History of the Study of Religion. Examination of pivotal issues, schools, and theorists in the study of religion. [3]

3531. Religious Narrative and the Self. The construction of identity in religious autobiography: motivations (personal salvation, witness, proselytism); relationships among self, God, and religious tradition; role of memory; oral vs. written; cultural, gender, and religious differences. Readings may include Augustine, Gandhi, Malcolm X, Angelou, Wiesel. [3] Geller.

3535. Black Islam in America. Varied expressions of African American Islam beginning with the bringing of Muslims as slaves from West Africa. Developments extending from the Moorish Science Temple to the Nation of Islam, other communities, and their leaders, including Malcolm X. [3] Baldwin.

3537. The Holocaust: Representation and Reflection. [3] *See description under Jewish Studies.*

3880. Seminar: Themes in Jewish Studies. [3] *See description under Jewish Studies.*

3954. Methods in the Sociology of Religion. Explores the research methods employed in sociology: research design—including theory, hypothesis formation, and measurement; univariate and simple multivariate analyses. Qualitative methods also will be addr essed, and ethical issues in human research will be examined. [3] Sandberg.

3982. Reading Course in Judaism. [1–3] *See description under Jewish Studies.*

3985. Reading Course in History and Critical Theories of Religion. May be repeated. [1–3] Staff.

Anthropology 226. Myth, Ritual, Belief: The Anthropology of Religion. Crosscultural survey of religious and ritual beliefs in the light of theories of r eligion. Topics include sacrifice, myth, witchcraft, divination, religious change, and millenarian movements. [3] Staff.

Anthropology 250. Shamanism and Spiritual Curing. A crosscultural inquiry into shamanism and sorcery. Examines altered states of consciousness, hallucinogens, spirit possession, and nontraditional techniques of curing. Contrasts shamanism with W estern approaches to curing. Implications for religion, theories of the mind, and dream analysis. [3] Conklin.

Philosophy 211. Medieval Philosophy. Comparative study of key figur es in Islamic, Jewish, and Christian philosophy as they struggle with the philosophy of logic, metaphysics, language, culture, politics, ethics, and nature. [3] Dobbs-Weinstein.

Philosophy 218. Hellenistic and Late Ancient Philosophy . (Also listed as Classics 218) Philosophical ideas of Stoics, Cynics, Epicur eans, skeptics, Peripatetics, Neoplatonists, and early monotheist thinkers such as Philo, Origen, and Philoponus. [3] Staff.

Philosophy 231. Philosophy of History. Focus on alternative conceptions of time and history in Aristotle, Augustine, Kant, Hegel, Heidegger, and Benjamin. [3] Staff**.**

Philosophy 332. Seminar: History of Philosophy. See *Schedule of Courses* for topics.

Sociology 246. Sociology of Religion. Theories of nature, function, and structur e of religion. Religion in America, including fundamentalism, the Black Church, and cults. How religion changes and is changed by secular society. [3] Staff.

VII. Homiletics and Liturgics

2706. The History of Christian Liturgy. As an introduction to the origins and development of Christian worship and rituals fr om 100 to 1600 C.E., the course will encourage students to explore the underlying structures of different worship practices as well as the function of rituals in various times and places. [3] Jensen.

2708. Sacred Time/Christian Liturgy. The course examines the construction of the Christian calendar (daily hours, weekly patter ns, seasons, and special occasions) with attention devoted to comparative sacr ed cycles in other ancient r eligions. Students will explor e the structure as well as the theory of consecrated time and its role in structuring and enacting religious practices as well as sacr ed story. The differences among various Christian gr oups will be examined, as well as the theological, social, and cultural distinctions that may explain, in part, such distinctions. [3] Jensen.

2709. Images of God in Visual Art. Considers the way visual artists of past and present have indicated and provided analogies for the Divine r eality. Issues will include various r eligious perspectives on idolatry and iconoclasm, the place of censorship and the pr oblems of transgressive art, and the role of art in Christian practices. [3] Jensen.

2710. Aesthetics and Spiritual Formation. Explores the nature and the role of aesthetics in theological reflection and spiritual for mation. The place of the ar ts in the development and expression of r eligious faith is of central concer n, as well as the definition and function of beauty and its place in human understanding and appr ehension of the Divine. Readings will be drawn from such ancient and contemporary thinkers as Plato, Augustine, John of Damascus, Bernard of Clairveaux, George Steiner, and Simone Weil. Class projects will include visits to local churches and art museums. [3] Jensen.

2759. Theology of Pr oclamation. Reflection on the phenomena of public worship and forms of speaking the gospel. Theological issues in Christian worship; theological issues in the sacraments; the her meneutic problem as a pr oblem for preaching; theological understandings of proclamation. [3]

2801. Introduction to Homiletics. The course is an examination of the theologies and methods of pr eparing sermons from Biblical texts and an exploration of her meneutical approaches, oral/aural skills, rhetorical strategies, narrative and connective logic; students are responsible for developing a working theology of the W ord, reviewing major homiletic theories, completing exegetical assignments, skill-building exer cises, sermon sketches, and sermon manuscripts; in-class preaching is required. [3] Braxton.

2802. The History of Preaching in the United States. This course will function on two levels by offering a substantive survey of preaching in the Unites States from the seventeenth century to the pr esent and by examining the writings in the philosophy of histor y (Hegel, Nietzsche, White, and Wyschogrod) to explore the role of history in constructive ethics and practical theology; class sessions will addr ess both sanctioned and unsanctioned preaching by women and men from multiple regions, racial and ethnic groups, social classes, and religious traditions. [3] Smith.

2803. Preaching, Worship, and Technology. As an exer cise in cultural criticism of chur ch practices, this course will incorporate writings from ethics and social theor y (Adorno, Arendt, Borgman, Foucault, and Haraway) together with concrete questions in contemporary preaching and worship (PowerPoint, video, pulpit design, and cyborg preachers). [3] Smith.

3004. Narrative Theology and Pr eaching. An examination of selected r eadings in theology of narrative and their impact on homiletic method. Reflection on the interplay of texts, tradition, and narrated experience, with implication for sermonic design. [3]

3009. Modern Homiletic Theory. Homiletic theory and practice have under gone tremendous changes in the past century. This course traces developments from the deductive and propositional homiletics of the late nineteenth centur y, through the liberal topical and "project" method of the early twentieth centur y, new-orthodox and Barthian emphases, inductive homiletics, narrative homiletics, structuralist and phenomenological models, and mor e recent postmodern construals of homiletic theory. Students will r ead and analyze ser mons using these theories, and opportunity will be given to construct sermons using these methods as well. [3] J. McClure.

3010. Homiletic Analysis: The T wentieth-Century Pulpit. Examination of method in homiletic criticism through an analysis of selected American ser mons 1950–1990 and parallel literature in homiletic theory. [3]

3011. Black Preaching. The theology and styles of black preaching. Sermons of the most effective black preachers of today and yesterday. Methodologies for effective outlining, manuscript development, and use of illustrations are discussed. [3]

3014. Advanced Homiletic Problems. Advanced seminar in which selected homiletic problems are addressed through an analysis of students' sermons. Hermeneutic approach to Hebrew scripture, preaching of eschatological texts, addressing of social issues. [3]

3025. Interpreting Scripture. Review of major biblical themes, with attention to issues raised for homiletic theory by historical scholarship, hermeneutics, and theology. [3]

3028. Orality, Ritual, and Liturgics. Focus on the contributions of orality theory, language and culture, and ritual theory as they inform the study of liturgical practices. Study of the works of Walter Ong, Mary Douglas, Victor Turner, Gerald Davis, Edwards and Seinkewica, and others as they relate to the group identity and practices of specific religious communities. [3]

3031. Preaching Jesus Christ. The content of Christian preaching addresses the Life, Death, and Resurrection of Jesus Christ, but in every age, the meaning of Jesus Christ must be interpreted anew. Christology is difficult because of research in the historical Jesus and the rising expression of other religious traditions. As an intermediate-level elective, this course will review tradition concerns of Christology: Jesus' Incarnation, Atonement, Sinlessness, Miracles, Teaching, Resurrection, and Ascension. We will try to locate metaphors, images, and ways of explanation to present such theological concerns to twenty-first century congregations. After initial introductory lectures, the class will feature a presentation by the instructor and student sermon-presentations each week. The requirements for students in the master of divinity and master of theological studies degree programs include one sermon with a homiletical rationale and a term paper-project; three books will be assigned as well. Enrollment is limited to eighteen students. An additional hour of instructional time will be required for doctoral students in the graduate department of religion. [3] Buttrick.

3032. Preaching Theology. In-depth exploration of the ways that theology comes to play in sermon preparation and preaching. Particular attention is given to the presence in preaching of theological methods, authorities (scripture, reason, experience, and tradition), theistic worldviews, theodicies, models of church and culture, ideas of atonement, the relationship between religions, and personal and historical eschatologies. Graduate students will be expected to do sermon analyses and/or preach twice for the class. [3] J. McClure.

3033. Preaching and Christian Apocalyptic. Focus on theological issues in preaching eschatological and apocalyptic texts. Survey of classic debates, relationship to Jewish apocalyptic, social location, hermeneutics, and homiletic approaches to preaching apocalyptic. Perspectives on Johannine, synoptic, and Pauline material. [3]

3034. Preaching Paul. Theology, themes, and rhetorical strategies in the epistles, especially for parish preaching. Focus on new creation, fruits of the spirit, wisdom and folly, cross and resurrection, body metaphors, and practical strategies for developing sermons related to Pauline texts. [3]

3037. Women, Christology, and Preaching. Survey of the impact of various feminist Christologies on homiletic method and theory. Consideration of feminist, womanist, mujerista, Asian, and lesbian discussions of suffering and liberation as they relate to traditional doctrines of incarnation, crucifixion, and resurrection; and the implications for Word and Sacrament within Christian communities. [3]

3042. Preaching the Christian Year. An exploration of the formation and meaning of the seasons of the Church Year—Advent, Christmas, Epiphany, Lent, Good Friday, Easter, Pentecost, and other special days. Students analyze theological issues and present sermons for the times of the Christian Year. [3]

3045. Narrative, Communication, and Religious Identity. Within the religious imagination, mythical, historical, traditional, communal, ritual, homiletical, and personal narratives work together to shape communal and personal identities. This course investigates the ways in which narrative functions, especially in local religious communities, to shape, subvert, and transform human identities. [3] J. McClure.

3048. The Interdisciplinary Study of Preaching and Worship. Preaching and worship are liturgical acts involving theological, anthropological, and cultural dimensions. This seminar will invite students to consider more deeply the multidimensional nature of these acts. Within the broad framework of practical theology, the seminar will examine traditional and emerging scholarship in critical discourse analysis, ritual and performance studies, orality studies, and the impact of technological media on preaching and worship. [3] Braxton.

3065. Psychology of Ritual and Myth. [3] *See description under Religion and Personality.*

3122. Themes for Preaching from the Hebrew Bible. [3] *See description under Hebrew Bible and Ancient Israel.*

3202. History of Christian Worship. [3] *See description under Historical Studies.*

3262. Baptism and Eucharist in Ancient and Medieval Christianity. The development of the practice and the theory of the Christian ritual of baptism and eucharist considered. Readings include descriptions and explanations of the rituals, as well as primary texts that discuss their significance and role in the Christian Church. [3] Burns.

3269. Eucharistic Faith and Practice. A historical examination of the eucharistic theologies and practices of the various branches of Christendom, beginning with the early church. Major focus on contemporary understandings. [3]

3271. Worship in the Reformed Tradition. Sources and contemporary development of liturgical theology in the Reformed tradition. [1]

3413. Ritual and Religious Experience. [3] *See description under Ethics and Society.*

3476. Developing Grounded Theories of Preaching and Worship. Most, if not all, theories of preaching and worship are logically deduced and based primarily on philosophical, theological, personal, or tradition assumptions. But what if theories were sought through the careful phenomenological, comparative, and theological analysis of a sampling of actual practices of preaching and worship? In this course, students will learn to investigate such practices with an eye to the development of grounded theories of preaching and worship. Methods of qualitative research taught in this course may be applicable to other fields of theological inquiry as well. [3] McClure.

3522. Myth, Ritual, and Symbol. [3] *See description under History and Critical Theories of Religion.*

3960. Special Topics in Religion. [3]

3961. Special Topics in Religion. [3]

3972. Reading Course in Homiletics. May be repeated. [1–3]

3973. Reading Course in Liturgics. May be repeated. [1–3]

VIII. Jewish Studies

2500–2501. Elementary Biblical Hebrew. A two-semester course of study leading to a reading knowledge of the Hebrew Bible. Open for credit to M.A. students only. [3–3] Staff.

2502. Aspects of World Religiosity. An introduction to the diverse modes and manners of world religiosity and to their study. Explores some of the primary forms of human religious practice through encounters with a variety of primary and secondary sources drawn from around the world. The student will come to appreciate the variety and complexity by which homo religiosus (the human defined by religiosity) makes it through the day (and night). [3] Geller.

2503. The Hebrew Bible. The life and thought of ancient Israel, with emphasis on the community's understanding of itself and of its role in history. Concentrates both on problems of historical and literary introduction and on Israelite religious practice and faith. Not available for Ph.D. credit in biblical studies. [3]

2513. Biblical Criticism: History and Traditions. Introduction to the resources, methods, and practice of biblical interpretation, with exercises on selected texts from the Hebrew Bible and the New Testament. Knowledge of biblical languages is not required. [3] Staff.

2514–2515. Elementary Modern Hebrew. Introduction to alphabet, the basics of grammar, and elementary conversation. Spring: greater emphasis on conversation and grammar. Open for credit to M.A. students only. [3–3] Staff.

2567. Music and Religion. An investigation into the many ways in which religion and music contribute to community formation throughout the world. Topics include music's interdependent relationship with religious texts, religious performance, trance, sacrifice, and folk origins. [3] Barz.

2750. The History of Religion in America. The history of the religions in America beginning with colonial religious experiments in the New World. Examines American "church history" as well as the influence of non-Christian religions in American culture. [3] Flake.

2814. Religion and Society. Examination of religion as a social phenomenon. Explores the writings of classical sociologists (especially Marx, Weber, and Durkheim). Readings in the areas of social theory, cultural analysis, and sociology of religion. Focus on the use of sociological insights toward understanding the relation between religion and Western social life. [3]

2815. Religion and Social Movements. *See description under Ethics and Society.*

3101. Readings in Biblical Hebrew. A reading course in selected texts of the Hebrew Bible for students who have taken 2500–2501 or its equivalent. [1] Staff.

3102–3103. Intermediate Modern Hebrew. Modern Hebrew reading, conversation, and advanced grammar. Spring: greater emphasis on reading and writing. Prerequisite: one year of Modern Hebrew or its equivalent. [3–3] Staff.

3108. Eighth-Century Prophecy. A study of the prophetic literature against its ancient Near Eastern background; emphasis placed on the eighth-century B.C.E. prophets and on the contemporary significance of their message. [3]

3109. Exilic Prophecy. A study of Hebrew prophecy from the seventh and sixth centuries B.C.E., with emphasis on the prophets Jeremiah, Ezekiel, and Deutero-Isaiah. The work, literature, and thought associated with these great prophets are studied against the background of the events surrounding the Babylonian exile. [3] Knight.

3111. The Pentateuch. A study of the first five books of the Hebrew Bible as the key for understanding Israelite history and theology and as the base point for some of the most critical questions in the study of biblical literature. [3] Staff.

3112. Apocalyptic. A study of the early Jewish and Christian apocalyptic movements and literature. [3] Knight, Levine.

3113. The Wisdom Literature in the Ancient Near East (ANE). Israel's wisdom corpus (Proverbs, Job, Ecclesiastes, Sirach, Wisdom of Solomon) in light of comparable literature from Egypt and Mesopotamia. Attention to the structure of wisdom thought, to literary forms, and to traditions. [3] Azzoni.

3115. The Psalms. A study of the Book of Psalms in general, along with readings of selected Psalms in Hebrew. The course will include an analysis of the types and setting of the Psalms in the life of Israel, a discussion of the religion of the poems and their poetic form, and a survey of modern scholarship in the area. [3]

3123. The Book of Exodus. General exegesis of the Book of Exodus, concentrating on the definition of its major themes and purposes. If necessary, additional time may be allotted for those requiring extra work in Hebrew or in textual criticism. [3]

3124. Esther and Ruth. Explores the two books in the Hebrew Bible named for women. Examines Hebrew narrative technique and feminist and postmodern criticism. [3] Staff.

3125. Book of Genesis. General exegesis of the Book of Genesis, concentrating on the definition of its major themes and purposes. Hebrew language not required. [3] Sasson.

3127. Cultures of Ancient Near East. A consideration of the cultural and religious milieus of the third and second millennia B.C.E., as they shed light on Biblical origins. [3] Sasson.

3128. Jewish Messianism. A study of messianism and messianic movements in Jewish history in the common era, including contemporary manifestations in Europe, Israel, and North America. [3] Sasson.

3129. Book of Judges. General exegesis of the Book of Judges, concentrating on its major themes, purpose, and narrative techniques. If necessary, additional time may be allotted for those requiring extra work in Hebrew. [3] Sasson.

3133. Book of Job. A study of the book of Job, attending to its literary features, religious themes, internal disputes regarding theodicy, and its relation to other texts from the region. [3] Knight.

3135. Sexuality in the Hebrew Bible and ANE. Explores how various sexual practices (prostitution, homosexuality, heterosexuality, rape, sodomy, incest) are dealt with in the Hebrew Bible and in the larger context of the ANE. [3] Azzoni.

3156. Jewish and Christian Self-Definition. A study of the various options (social, theological, scriptural, practical) facing Jews and Christians in the first three centuries C.E. and of the processes by which the various communities narrowed those options in their attempts to establish a normative identity. [3] Levine.

3169. Feminist Interpretations of Scripture. Examination of the representations of women, religious and ethnic "others," and sexuality in biblical and contemporary noncanonical (ANE, Pseudepigrapha, Gnosticism) texts, utilizing various approaches (literary, historical, anthropological, ideological, Womanist, Mujerista). [3] Levine.

3216. Sources of American Religious History. An introduction to primary sources of American religion and religious historiography, including works from such representative figures as Jonathan Edwards, Thomas Paine, Charles Finney, Emerson, Joseph Smith, Frederick Douglass, Walter Rauschenbush, Mary Baker Eddy, and Richard Niebuhr. [3] Flake.

3217. Church and State in American History. A study of the complex historical relationship between church and state in the United States. *See description under Historical Studies.*

3218. The Bible in American Religious History. *See description under Historical Studies.*

3225. Ancient Origins of Religious Conflict in the Middle East. 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] Drews, Wiltshire.

3226. Popular Religion. An examination of informal and unofficial practices, beliefs, and styles of religious expression that often stand in contrast or opposition to more formal ecclesiastical structures. Employs several approaches to the subject and treats examples from the seventeenth century to the present in Europe and America. [3]

3303. Religious Literature in Contemporary Contexts. A wealth of literature that describes religious experience has been published during the past decade. This course will investigate writing from a variety of religious traditions, including Protestant, Catholic, Jewish, Buddhist, and Muslim. Of prime concern will be how the authors recall experiences in past communities, shape alternative practices, and construct new literary forms through which to tell their stories. We will pay close attention to how gender, race, ethnicity, sexuality, and social class influence how religion is experienced. [3] D. Sasson.

3304. Rabbinic Thought and Theology. The Hebrew Bible, though foundational to traditional Judaism, is not central. Traditional Judaism is the heir of Rabbinic Judaism, which emerged from the academics of the Land of Israel and Babylonia in the first through seventh centuries of the Common Era. We will focus on the Rabbinic texts that helped define Judaism for over a thousand years in the post-Temple environment. Rabbinic Judaism constitutes a revolution in religiosity, and the weapon of the revolution was the midrash, or the creative Rabbinic rereadings of the Torah. Together we will explore both the messages and the methods of Rabbinic Judaism. [3]

3311. Modern Critics of Religion. An examination of the relationship between the critique of religion and the understanding of modernity. Focus on the writings of Feuerbach, Kierkegaard, Marx, Nietzsche, and Freud. [3] Geller.

3322. Theology of World Religions. The recent interreligious dialogue and its implications for Christian theology. The way in which global religious pluralism affects the nature and task of theology and the relation among major world religions as claims to truth. [3]

3335. Religious Language. Symbol, metaphor, and analogy in literary theory, linguistic analysis, and theology. [3]

3342. Feminist Hermeneutics. The revisionary interpretation feminists are currently proposing in such areas as literary theory, anthropology, psychology, ethics, and philosophy and their possible effect on contemporary theology and biblical analysis. [3]

3400. Social Ethics. *See description under Ethics and Society.*

3410. Political Ethics. *See description under Ethics and Society.*

3412. Ethics and Society. *See description under Ethics and Society.*

3419. Twentieth-Century North Atlantic Ethics. *See description under Ethics and Society.*

3501. Judaism in New Testament Times. The varieties of Judaism that emerged from 200 B.C.E. to approximately 200 C.E. Discussions of the Maccabees, the politics and religion of the Hasmonean dynasty, the Dead Sea Scroll community at Qumran, the Sadducees, Pharisees and Essenes, Philo, the early church and early rabbinic Judaism all placed in their Hellenistic and Roman contexts. Major themes in the development of Messianism and Apocalypticism. [3]

3502. Antisemitism and Jewish Identity. A historical and cultural analysis of the dilemmas Jewish emancipation presented to both Jews and non-Jews, examined through the study of a variety of popular and elite cultural representations of Jews. How antisemitism became entangled with the problems of gender, sexual, racial, class, and self identity. [3] Geller.

3503. The Jewish Heritage. A survey of Jewish history and literature for a better understanding of Jesus' Jewish roots and its important foundation of both Christianity and Islam. Sponsored by the Jewish Chautauqua Society. [3]

3505. Jewish Ethics. By tracing environmental issues through the Bible, Talmud, medieval codes and mystical texts, we will analyze how contemporary Jewish environmentalists are using these traditional sources to further their own agendas. The course will be two-pronged: (1) understanding the primary genres of Jewish law and ethics as well as the mechanisms of Jewish legal development, and (2) analyzing the specific issues involved in Judaism's complicated relationship to the environment. [3]

3509. Introduction to the History and Critical Theories of Religion. *See description under History and Critical Theories of Religion.*

3522. Myth, Ritual, and Symbol. Various theories concerning myth and symbol. The specifically religious and humanistic content is sought through the study of a wide variety of myths and symbols in primitive and modern religions. [3] Geller.

3524. The Holocaust: Its Meanings and Implications. This course examines the systematic destruction of the European Jewish communities during World War II and the historical, social, political, and cultural developments that led to the destruction. During the class sessions, students will explore the psychological and sociological dimensions of the Holocaust's aftermath and the philosophical and theological problems the event presents for both Jews and Christians. [3] Geller.

3525. History of the Study of Religion. Examination of pivotal issues, schools, and theorists in the study of religion. [3]

3530. Comparative Studies in Religion. Comparison of various religions focused on themes such as God, the human condition, history, salvation, ethics, scriptures, and religious communities, using materials from the world's religions, East and West, past and present. [3] (Not currently offered)

3531. Religious Narrative and the Self. The construction of identity in religious autobiography: motivations (personal salvation, witness, proselytism); relationships among self, God, and religious tradition; role of memory; oral vs. written; cultural, gender, and religious differences. Readings may include Augustine, Gandhi, Malcolm X, Angelou, Wiesel. [3] Geller.

3537. The Holocaust: Representation and Reflection. Explores fundamental questions about the nature of history and representation, the nature of the human and the divine, that the Holocaust raises. Prerequisite: 3524 or its equivalent. [3] Geller.

3800. The Dead Sea Scrolls. The materials from Qumran and other locations in the Judean Desert and Jordan Valley, with reference to their contributions to the understanding of Judaism in the period 200 B.C.E. to 100 C.E. and of earliest Christianity. Open to graduate and advanced Divinity students. Prerequisite: Hebrew. [3] Hunt.

3801 The Megillot. Five scrolls, each a different genre of literature, are customarily read in synagogues throughout the year: Esther (Purim), Song of Songs (Passover), Ruth (Shavuot), Ecclesiastes (Sukkot), and Lamentations (Ninth of Av). We sample them and discuss them within the context of ancient Near Eastern literature. For students with at least one year of Hebrew. [3] J. Sasson.

3802. Exegesis of the Bible. Study of the principles, methods, and tools used in the critical study of the Hebrew Bible, including textual, historical-critical, ideological, literary, and other exegetical methods. [3] Knight, Hunt.

3803. Ben Sira with Introduction to Mishnaic Hebrew. Introduction to grammar and vocabulary of Mishnaic Hebrew, with practice in reading and guidance for further study. Reading of selected portions of the Hebrew text of Ben Sira. Emphasis on the experience in reading unpointed Hebrew text of this period, relevance for textual criticism, use of the Greek version, and the place of the book and its theology in the development of Israelite wisdom in general. [3] Azzoni.

3805. Job and Qoheleth. Israelite skepticism, with emphasis on the literary form, thematic coherence, and religious viewpoint of Job and Qoheleth, interpreted within the broad spectrum of Israelite wisdom and consideration of Greek influence. [3] Staff.

3806. The Song of Songs. The seminar will involve a rigorous study of the text, analyses of the literature, and inquiry regarding the religious significance and social background of the book and the role of the Song of Songs in the theology of the Hebrew Bible. Students who enroll from the Graduate Department of Religion, as well as students with proficiency in Biblical Hebrew, will have an additional class hour to concentrate on Hebrew. [3] Hunt.

3807. Proverbs. Analysis of the Book of Proverbs, with emphasis upon translation, themes, and literary features and the function of aphorisms and instructions in the ancient Near East. [3]

3808. Seminar: Hebrew Bible. Reading of selected writings and critical reflection on their significance for clarifying the Hebrew Bible. Knowledge of Hebrew required. [3]

3809. The Sociology of Early Israel. The nature of Israelite society, especially in its early periods, through readings in source materials and selected sociological interpretations. [3] Knight.

3811. Modern Interpretations of the Hebrew Bible. Characteristic approaches to the history and religion of ancient Israel, as seen in selected writings by prominent scholars since the Enlightenment. Attention to the presuppositions of each scholar and to the view of Israel afforded in each study. Reading ability in German desired. Consent of instructor needed for non-Ph.D. students. [3] Knight.

3812. Postexilic Literature and Theology. The literary heritage of ancient Israel from about 538 B.C.E. to 165 B.C.E. Attention to postexilic portions of the book of Isaiah; Haggai; Zechariah; Malachi; I and II Chronicles; Ezra-Nehemiah; Ruth; Esther; Song of Songs; Daniel. The variety of theological perspectives found in this period of Israel's history and the character of religious thought prior to the Maccabean period. [3]

3813. History of Ancient Israel. Examination of the major areas of debate in the reconstruction of the history of ancient Israel and analysis of the important extra-biblical sources that have contributed to the scholarship on ancient Israel's history. The course also will address the roles that ancient Israel's Near Eastern neighbors played in the development of ancient Israel's history. [3] Azzoni.

3816. Advanced Hebrew. Reading of selections from the Hebrew Bible, with emphasis on syntax and text criticism. Prerequisite: Elementary Biblical Hebrew. [3] Knight.

3818. Aramaic. Vocabulary, forms, and syntax of Aramaic through reading of the Aramaic sections of Daniel and Ezra and of specimens of material from the Elephantine papyri, the Targums, etc. Prerequisite: 3816. [3] Azzoni.

3819. The Targums. An introduction to the Jewish Aramaic translations and interpretations of the Hebrew Bible. The course will aim at familiarizing students with Jewish Literary Aramaic as reflected by the various Targums. Furthermore, by examining different translations of the same biblical passage, different interpretative approaches will be highlighted. [3] Azzoni.

3823. Literature of the Ancient Near East. Readings in the literature from Egypt, Canaan, and Mesopotamia, with special emphasis on texts relating to the culture, literature, and thought of ancient Israel. FALL. [3] Sasson.

3828. Book of Daniel. An in-depth analysis of the Book of Daniel, with particular attention to the text, its historical background and literary form. The place of the Book of Daniel within Prophetic and Apocalyptic literature will also be discussed. [3] Azzoni.

3880.01. Seminar: Modern Jewish Identity. Considers how Jewish thinkers at the end of the nineteenth century and early twentieth century addressed the question of individual and collective identity by examining the cultural, political, and religious definitions of modern Jewish identity, the role of the reinvention of cultural, political, and religious definitions of modern Jewish identity, the role and the reinvention of national myths, the "Jewry of muscles," the "new Hebrews," and the Zionism myth narratives in Zionism. [3] Urban.

3880.03. Seminar: Judaism and the Problem of Evil. Investigates the explanation for the origin, nature, and representations of evil from Scripture through the Hasidic masters as well as the reflections of modern thinkers. [3] Urban.

3880.04. Seminar: Zionism and Its Critics. As a course from the Jewish Studies curriculum, the seminar will address the history of the Zionist idea from the nineteenth century by focusing on ideological, cultural, and religious issues and by examining criticism from within and without the movement. [3] Urban.

3881. Historiography and Ancient Israel: Chronicles. Examines issues of historiography as they relate to Ancient Israel with a particular focus on the Book of Chronicles. Focuses on the content of Chronicles as well as sociohistorical contexts and methodological issues. Ph.D. students will do an extra session with the Hebrew text. [3] Hunt.

3923. God in the Western Tradition. The major philosophical and theological texts of the Western tradition from Plato to the twentieth century. The changing history of the interpretation of God from Christian neoplatonism to nineteenth- and twentieth-century challenges of classical approaches. [3]

3953. Seminar in Sociology of Religion. Explores a number of possible topics in the Sociology of Religion. Topics may focus on classical theorists (Weber, Troeltsch, Durkheim), the study of religious movements, popular religions, rituals and religious Experience, and the application of social scientific research methods for the study of religion. [3]

3982. Reading Course in Judaism. May be repeated. [1–3] Staff.

Anthropology 226. Myth, Ritual, Belief: The Anthropology of Religion. Crosscultural survey of religious and ritual beliefs in the light of theories of religion. Topics include sacrifice, myth, witchcraft, divination, religious change, and millenarian movements. [3] Staff.

Anthropology 263. Myth and Legend: The Anthology of Oral Tradition. Narrative traditions and folklore of Western and non-Western cultures. Myths of world creation, human origins, and transformation. Relationship of myth to dream, historical narrative, and social organization. Myth telling and performance. The structure and theory of myth. [3] Staff. (Not currently offered)

Anthropology 265. Psychological Anthropology. How personality and culture affect each other. Socialization and the life cycle, the definition of sex roles, individual psychology and group aggression, religion and group personality, and the nature of mental illness and normalcy in non-Western societies. [3] (Not currently offered)

Anthropology 284. Problems in Anthropological Theory. An advanced seminar in anthropological theory: cultural evolution, cultural history, ethnic relations, cultural ecology, archaeological method and theory, social structure, political organizations, religious institutions. FALL. [3]

Anthropology 310. Archaeological Method and Theory. Development of archaeology as a discipline; relationships with anthropology and history; intellectual trends. Prerequisite: consent of instructor. [3] (Not currently offered)

Anthropology 315. Seminar in Anthropological Theory: History, Themes, and Current Issues. An advanced consideration of the history of anthropological theory and recent issues and controversies. Emphasis on theories of cultural evolution and development of complex societies. Dialectical exploration of ideas requires each student to argue contrasting perspectives. [3] (Not currently offered)

Anthropology 322. Culture, Structure, Personality. Integrative anthropological approaches to human behavior examining symbolism, values, the organization of the group, interaction and psychology. [3] (Not currently offered)

Art History 241. American Art 1865 to 1945. 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. SPRING. [3] Fryd.

Art History 242. Art since 1945. A survey of art produced in the United States and Europe since 1945 with emphasis on theory and social and intellectual factors. FALL. [3] Fryd.

Art History 301. The Methods of Art History. Comparative analysis of art historical methods including social history, post-structuralism, feminism, gender studies, stylistic analysis, and iconography. Assessment of methods in action through critiques and exercises in independent application. FALL. [3] Folgarait, Fryd.

Classical Studies 209. Greece and the Near East from Alexander to Theodosius. From Alexander's conquest of the Persian Empire to the ascendancy of Christianity in the late fourth century. Emphasis on social, cultural, and religious transformations, within the framework of political history. [3]

Comparative Literature 330. Seminar in the Enlightenment and Its Literary Connections. FALL. [3] McCarthy.

Comparative Literature 360. Philosophy and Literature. Problems and methodological issues inherent to the study of these two disciplines. [3]

English 232a–232b. Twentieth Century American Novel. 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, and Pynchon. 232a: emphasizes writers before 1945; 232b emphasizes writers after 1945. FALL, SPRING. [3–3] Bell, Chen.

English 268a. America on Film: Art and Ideology. American culture and character through film, film theory, and literature. FALL. [3] Girgus.

English 278. Colonial and Post-Colonial Literature. Literature from countries colonized by Europe from eighteenth to twentieth century. Examines implications of colonial encounter and formation of "post-colonial" culture and such issues as language, agency, gender roles, and relation between power and narrative. Such authors as Forster, Coetzee, Okri, Tagore, Chatterjee, Kincaid, Rushdie, Soyinka. [3] Barsky.

German 241. The Racial Imagination. The complex and contradictory history of the idea of "race" as a scientific category. Study of medical, scientific, philosophical, anthropological, and literary texts. No German required. FALL. [3] Eigen.

German 269. Writing under Censorship. An introduction to the main literary trends and authors of the former East Germany (1949–1989). [3] (Not currently offered)

German 270. German Film. A survey of the German film with special attention to its sociocultural context and to pertinent theories of photography and of cinematic narration. No knowledge of German required. SPRING. [3] Sevin.

German 273. Nazi Cinema: The Manipulation of Mass Culture. 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 German required. [3] Eigen.

German 340. Beyond Good and Evil. Emergence of and complexity in literature against the backdrop of Nietzsche's *Beyond Good and Evil* (1886), E. O. Wilson's *Consilience* (1998), P. Cillier's *Complexity and Postmodernism* (1998); "beyond good and evil" as a catch phrase of modern decenteredness in such works as *Notes from Underground*, *Mysterious Stranger*, *The Tin Drum*. FALL. [3] McCarthy.

German 351. Philosophical Backgrounds of German Literature. Survey of German philosophical thinking from Leibnitz to Nietzsche and its importance for German literature from Goethe to Hesse. SPRING. [3] McCarthy.

History 220. Europe in the Nineteenth Century. Major political, social, economic, and cultural developments from 1815 to 1914. FALL. [3] Schultz.

History 225. Europe from World War I to World War II. Political, socioeconomic, cultural, and colonial history of Europe from 1914 to the fall of Hitler. [3] Schulz. (Not currently offered)

History 226. Europe since 1945. 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] Schulz. (Not currently offered)

History 231. History of Germany in the Twentieth Century. 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. No credit for students who have completed 230b. [3] Smith. (Not currently offered)

History 235. Modern France. From the French Revolution of 1789 to the present. Emphasis on politics, with some attention to the major economic, social, cultural, and intellectual developments. SPRING. [3] Ramsey.

History 237. Russia: Tsardom to Empire. Russian history from fifteenth-century Muscovite state, society, and economy; orthodox Russian culture and religion; Peter the Great and Catherine the Great; eighteenth century absolutism, empire, serfdom, and intellectual life. [3] Wcislo. (Not currently offered)

History 245. Victorian England. Cultural values, liberal reform, urbanization, women and gender, imperialism. [3] Epstein. (Not currently offered)

History 256. Nationalism and Islam in the Middle East since 1798. Secular nationalism and the changing nature of Islamic identification in the Middle East with emphasis on Egypt, Turkey, Iran, and Palestine/Israel. SPRING. [3] Longwell.

History 277. The New South. 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. SPRING. [3] Carlton.

History 321. Topics in European History: Interdependence and Internationalism since 1648. Focuses on Europe, the European expansion, and the gradual interweaving of societies, economies, and polities in Europe and the world since 1648. The course comprises three modules with heavy reading emphasis on (1) the "human web" (cultural, financial, commercial, associational, migration, flow of energy), (2) the culture of nationalism and internationalism, mainly in the nineteenth century, and (3) the rise and historical significance of international institutions in the nineteenth and twentieth centuries. FALL. [3] Schulz.

Philosophy 211. Medieval Philosophy. 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] Goodman. (Not currently offered)

Philosophy 218. Hellenistic and Late Ancient Philosophy . Philosophical ideas of Stoics, Cynics, Epicureans, skeptics, Peripatetics, Neoplatonists, and early monotheist thinkers such as Philo, Origen, and Philoponus. [3] (Not currently offered)

Philosophy 231. Philosophy of History. Focus on alternative conceptions of time and history in Aristotle, Augustine, Kant, Hegel, Heidegger, and Benjamin. [3] Staff. (Not currently offered)

Philosophy 240. Aesthetics. The leading accounts of the nature of art, the character of aesthetic experience, the nature of artistic creation, and selected problems associated with art in specific media. FALL. [3] Neufeld.

Philosophy 242. Philosophy of Religion. A study of various problems concerning religious experiences; ideas about religion and divinity. FALL. [3] Tlumak.

Philosophy 243. Philosophy of Film. 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] (Not currently offered)

Philosophy 245. Humanity, Evolution, and God. 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] Goodman. (Not currently offered)

Philosophy 258. Contemporary Political Philosophy. The emergence of post-liberal political thought. Topics include the politics of recognition, the specificity of political action, transformations in political theory as a consequence of gender , race, and environmental issues. These will be studied through examination of the writings of Hannah Arendt, Cornelius Casoriadis, Heidegger, Derrida, Habermas, etc. [3] Staff. (Not currently offered)

Philosophy 260. Twentieth-Century Continental Philosophy. A study of selected twentieth-century philosophers such as Derrida, Foucault, and Lacan. SPRING. [3] Wood.

Philosophy 294b. Selected Topics: Forms of and Responses to Evil. Study of changes in our understanding of evil from the Book of Job through the 1755 Lisbon earthquake to the Holocaust and September 11, and of various individual and collective responses to evil. Centrally invoked philosophical materials will be enriched with religious, psychological, and artistic perspectives. [3] Tlumak.

Philosophy 330. Seminar in Philosophy: History of Philosophy. Spinoza. FALL. [3] Dobbs-Weinstein.

Political Science 246. Religion and Politics in the United States. The historical and contemporary impact of religion on political culture, coalitions, and behavior in the United States. The vitality of religion in American society and its political consequences. The evolution of church-state relationships. [3] (Not currently offered)

Sociology 246. Sociology of Religion. Theories of 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. SPRING. [3] Pitt.

Sociology 255. Racial and Ethnic Minorities in the United States. 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] (Not currently offered)

IX. New Testament and Early Christianity

2511. The New Testament. How the New Testament shows the main characteristics of early Christianity as compared and contrasted with early Judaism and with Hellenistic religions. Religious authority in early Christian communities and the types of faith and ethics found within the New Testament traditions. Not available for Ph.D. credit in biblical studies. [3] Segovia.

2513. Biblical Criticism: History and Traditions. Introduction to the resources, methods, and practice of biblical interpretation, with exercises on selected texts from the Hebrew Bible and the New Testament. Knowledge of biblical languages is not required. [3] Staff.

3035. Paul and Politics. Paul formed his gospel in the cauldron of an apocalyptic theology that mingled religion and politics. This volatile mixture produced a provocative counter-claim to Roman imperial culture. This seminar will explore Paul's responses to pressing religious and political issues of his time such as Roman imperialism, slavery, the role of women, ethnic reconciliation, and sexual identity. Additionally, the seminar will examine the enduring role of Paul's letters in contemporary conversations around cultural and political issues. Advanced M.Div. and M.T.S. students must receive the permission of the instructor. [3] Braxton.

3150. Lives of Jesus: Ancient and Modern. An exploration of ancient and modern interpretations of the story of Jesus to see the ways in which generations of Christians have told this story to fit the needs of their own particular settings and cultures. [3] Levine.

3151. Jesus and the Early Christian Communities. How the Gospel writers present the traditions about Jesus in response to historical problems and religious questions current in first-century communities. The relation of the Jesus of history to the Gospel portrayals. Prerequisite: 2511, or its equivalent. [3] Levine.

3152. Interpreting the Gospels. The Gospels through history and cultures. A survey of their interpretations from their original historical contexts, 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] Patte.

3154. Gospel According to Luke. Exploration of Luke's compositional techniques, possible sources, Christology, community formation, and ethics, utilizing a variety of approaches (sociohistorical, literary, ideological, feminist). Knowledge of Greek required. [3] Levine.

3156. Jewish and Christian Self-Definition. Students will examine the various options (social, theological, Scriptural, practical) that confronted Jews and Christians in the first three centuries of the Common Era and the processes by which the various communities narrowed these options in their attempts to establish a normative identity. [3] Levine.

3160. Synoptic Studies. Introduction to basic issues of synoptic research and methodology, with an emphasis on the message and theology of the individual evangelists. [3] Patte.

3161. The Parables in Exegesis and Interpretation. The nature of parable as form; the history of the interpretations of parables; the study of parables in the setting of the ministry

of Jesus and the theology of the Evangelists; and literary criticism and the interpretation of the parables. [3] Levine, Buttrick.

3162. The Pauline Interpretation of Christianity. Pauline Christianity and its place in the early church, using the letters of Paul, the deutero-Pauline letters, and the portrait of Paul in Acts. Attention to the problems of method. Greek not required. [3] Patte.

3163. Exegesis of Selected Pauline Letters. Selected Pauline letters are the base from which the character and content of Pauline theology are explored. The development of basic skills in exegesis is emphasized. [3] Patte.

3164. The Johannine Literature. Exegesis of selected passages of the fourth gospel, with emphasis on the major Johannine themes and symbology. [3] Segovia.

3165. Matthew. Through analytical approaches such as historical-critical, literary, sociological, and ideological, students will reconstruct Matthew's audience, both actual and ideal, and explore the topics of Christology, ecclesiology, debates with the synagogue, politics, and artistry of composition. [3] Levine.

3166. The Problem of Biblical Authority. A study of controversies over the authority of Scripture. Various uses of Scripture to clarify doctrinal statements about Scripture and revelation. Comparison of the views of Scripture held in early Palestinian Judaism, New Testament Christianity, selected periods of church history, contemporary evangelical and liberal circles, the Black church, and secular culture. [3] Patte.

3167. History of Reception of the New Testament and Exegesis. Selected instances of the reception of New Testament texts throughout the history of the Church and today, in the East and the West, in the "first" and in the "two-thirds" world, by religious and secular readers as well as by biblical scholars. Special attention to the interface of these diverse readings and of contemporary critical interpretations. [3] Patte.

3169. Feminist Interpretations of Scripture. Examination of the representations of women, religious and ethnic "others," and sexuality in biblical and contemporary noncanonical (ANE, Pseudepigrapha, Gnosticism) texts, utilizing various approaches (literary, historical, anthropological, ideological, Womanist, Mujerista). [3] Levine.

3173. The Book of Revelation. The Book of Revelation has puzzled interpreters for centuries and was nearly excluded from the canon in the fourth century and was shunned by Protestants during the Reformation. In this course, students will explore the reasons behind Revelation's disputed status. The class will begin with the text of Revelation itself, and students will learn practices of New Testament interpretation by preparing a section of text for each class meeting. Students will be pay particular attention to the literary genre and style of this book and to its social and historical context by exploring the variety of ways the text has been understood. Participants in the course will learn to recognize interpretive choices that a reader of Revelation makes and to analyze how the interpreter's social context may affect the interpretation. A range of scholarly and popular interpretations of Revelation—written, musical, and visual—will be considered. Sessions will be discussion-oriented with brief introductory lectures. [3] Hylen.

3174. Ethics of the New Testament. The ethical teaching found in selected documents of the New Testament (such as the Sermon on the Mount, Luke-Acts, Paul's letters). Comparison of these documents in terms of the types of behavior expected of the believers and of the basis upon which their specific ethical teachings are established. [3] Patte.

3176. Cultural Criticism and the New Testament. An introduction to the paradigm of cultural criticism in biblical studies, with a focus on theoretical orientations, approaches to the text, and interpretations of texts. Previous work in biblical criticism required. [3] Segovia.

3344.01. Contemporary Biblical Hermeneutics: The U.S. Scene. An analysis of the methods and goals of biblical interpretation in the United States since the decline of historical criticism, with special focus on reader response criticism and the relationship between social location and interpretation. [3] Segovia.

3344.02. Ideological Criticism: Socioeconomic and Liberation Studies. Analyzes the juncture of economic studies and biblical criticism in the texts of early Christianity as well as in the interpretations and interpreters of such texts in modernity and postmodernity; the course has a two-fold focus: the trajectory and parameters of hermeneutics of liberation and the questions of political economy and social class in the Roman Empire. [3] Segovia.

3344.03. Ideological Criticism: Postcolonial Studies. Ideological criticism may be seen as a fourth major paradigm in biblical interpretation, with a focus on the analysis of unequal relations of power in society and culture. This seminar will address a particular set of such relations: the analysis of the conceptions of race and ethnicity and the allied notions of nations, diasporas, and minorities. Ideological criticism is profoundly interdisciplinary in character and requires, therefore, attention to a body of work outside biblical studies. [3] Segovia.

3345. Contemporary Biblical Hermeneutics: The Global Scene. An analysis of the methods and goals of contemporary biblical interpretation in Africa, Asia, Latin America, and the West. [3] Segovia.

3347. Acts of the Apostles. Exegesis of selected passages from Acts 1–15 with foci on various methodological perspectives. Greek required. [3] Levine.

3830. New Testament Studies: Ethos and Locos /Methods and Theories. Open to GDR students only. [3] Segovia.

3834. Literary Criticism and the New Testament. The tradition of literary criticism from Plato to the present as a critical background for exploring recent literary studies of the New Testament. Knowledge of Greek required. [3] Segovia.

3836. Seminar: Structural Exegesis of the New Testament. Structural exegesis of various texts of the New Testament using methods derived from semiological literary criticism (Greimas, Barthes) and from structural anthropology (Lévi-Strauss). Prerequisite: Greek. [3] Patte.

3839. Cultural Studies and the New Testament. An introduction to the paradigm of cultural studies in biblical criticism, with a focus on theoretical orientations, approaches to the text, and interpretations of texts. Previous work in biblical criticism required. [3] Segovia.

3841. Seminar in New Testament. [Variable credit]

3843. Hellenistic Culture and Literature. Primary and secondary texts, presenting aspects of the history, literature, and religious traditions of the Hellenistic period (ca. 4th century B.C.E. to 4th century C.E.). Knowledge of Greek required. [3]

3845. Global Interpretations of the New Testament. Comparing interpretations of biblical texts by Christians in Africa, Asia, Latin America, and Oceania—where at present two-thirds of the readers of the Bible are located—with the interpretations of Orthodox Christians in Eastern Europe and the Middle East and by Catholic and Protestant Christians in Western Europe and North America. [3] Segovia.

3960. Special Topics in Religion. [3]

3961. Special Topics in Religion. [3]

3975. Reading Course in New Testament. May be repeated. [1–3]

X. Religion and Personality

3053. Seminar: Contemporary Psychotherapy and Pastoral Counseling. Recent trends in psychotherapy. Theories of personality and personality change, as do strategies for psychotherapy. Students will assess critically the implications of these theories for pastoral counseling. [3]

3054. Seminar: Method and Evaluation. The use of the social sciences in the investigation of religious phenomena. The psychological analysis of religion. Representative studies and empirical investigations are sampled. [3] Gay.

3055. Families: Theory and Practice. An examination of spiritual and moral formation and religious practices within families and congregations using academic and popular texts and field research. [3] Miller-McLemore.

3056. Seminar: Pastoral Method. A survey and critical examination of the various literatures on method in practical theology, pastoral theology, pastoral care, and ministry. Attention to the church as the locus for pastoral theology and a focus on questions of understanding and interpretation. [3] Flesberg.

3057.01. Seminar: Hope and Despair. This seminar from the pastoral theology and counseling discipline explores variable topics; for the spring term, the theme is hope and despair. [3] Vaughn.

3057.02. Body and Soul: The Intimate Connection. This seminar is designed to encourage students to develop an understanding and appreciation of the intimate and unbreakable connection between human sexuality and spirituality. [3] Flesberg, Lewis.

3058. Multicultural Pastoral Care and Counseling. Multicultural pastoral care and counseling through a consideration of the biases of traditional western approaches to counseling and the issues for a pluralistic world. [3]

3059. Seminar: Shame and Guilt. Students enrolled in this seminar will examine the dynamics of shame and guilt in social and personal life from theological, psychological, and pastoral perspectives. [3] Flesberg.

3060. Freudian Theories and Religion. Intensive reading and discussion of fundamental texts in psychoanalysis and their relationship to Freud's critique of religion. The basic requirements and texts are introductory; more advanced students can use supplementary texts and approaches. [3] Gay.

3061. Post-Freudian Theories and Religion. An examination of the Object Relations school of contemporary psychoanalysis (M. Klein, D. Winnicott, W. R. D. Fairbairn, Otto Kernberg, Heinz Kohut). Focus on both the clinical and the explanatory theories as they relate to the examination of religious experience and similar self states. [3] Gay.

3062. Research in Religion and Health. Introduces the empirical study of the relationship between health and religion and explores the ways in which the disciplines of theology, religion, psychology, and medicine affect such empirical study. Students will have opportunities to engage in research practica in health care and congregational settings. [1–3] Pace and Vollman.

3064. Practical Theology: Past, Present, and Future. Examines the history, theory, and practice of practical theology. Considers the relationship between practical theology and the other theological fields. Particular attention given to the role of practical theology in theological education, cultural studies, and congregational research. Permission of instructor required. [3]

3065. Psychology of Ritual and Myth. Religious rituals and myths from both Christian and other traditions. Major psychological theories of ritual and myth. Their relevance to an understanding of myth and ritual as religious phenomena. To be offered alternately with 3752. [3] Gay.

3066. Health and Salvation. Investigates the theory and practice of pastoral health care from theological, historical, psychological, and ethical perspectives. Special attention given to the relationship between health and salvation in particular religious traditions and cultures and in the experiences of men and women. Explores pastoral responses to this relationship in healing services, health-care institutions, health-care ministries, congregational nursing, visitation of the sick, and social advocacy for health care. [3]

3067. Sexuality: Ethics, Theology, and Pastoral Practice. A critical investigation of selected readings in the general area of sexuality, intimacy, and relationships as they inform pastoral practice. Uses autobiography and case study methods in conversation with theories in social sciences, ethics, and theology. [3] Flesberg.

3068. By Their Fruits? Pragmatics of Religious Coping. Explores the phenomena of coping and religious coping with various kinds of stress and forms of suffering. Close attention to the psychological, social, and theological dimensions of these phenomena. Evaluation of the constructs of coping and religious coping from various pragmatic and confessional theological perspectives. [3]

3069. Theories of Personality. A study of representative theorists within the different schools of psychology to clarify alternative understandings of the nature of personality and approaches to the psychological sciences. Attention is given to relationships with pastoral theology and counseling. [3] Miller-McLemore.

3070. Seminar: Gender, Sexuality, and the Family. Addresses the issues of divorce, custody, blended families, reproduction, infidelity and adultery, unpaid labor in the household, rape, incest, domestic violence, and "coming out." The class will focus on the delivery of pastoral care and counseling related to these issues and also will address the use of community resources to encourage further care. The course's design seeks to help prepare those who intend to be front-line care providers. For students who have not satisfied the seminar's prerequisite of an introductory course in pastoral theology and counseling, permission of the instructor is required for enrolling in the course. [3] Flesberg.

3072. Crisis Ministry of Pastor. Examines various pastoral responses to persons facing transitions (e.g., birth, vocational choice, partnering, marriage, aging, and dying) and crises (e.g., illness, bereavement, and interpersonal discord). Close attention paid to the theological and psychological dimensions of these experiences. Current research in coping and religious coping theory to develop strategies for theological reflection and pastoral action. [3] Flesberg.

3073. Seminar: Theological Foundations of Pastoral Care. Literature from selected eras is used to discover the influence of theological and cultural understandings on pastoral care orientations and practices. [3]

3074. Seminar: Pastoral Theology. A study of methods and topics in pastoral theology, focusing on the history of the field, the development of its procedures and subject matter, and a variety of contemporary approaches, problems, and revisions. [3] Miller-McLemore.

3079. Readings in Women, Psychology, and Religion. Focus on dialogue with feminists in the fields of theology, personality theory, and psychotherapy. Investigates (1) new developmental models and self-concepts; (2) altered views of therapy and therapeutic goals; (3) fresh understandings of theological and psychological world views; and (4) implications for pastoral care and theology. [3] Staff.

3081. Spirituality and Pastoral Care. An exploration into the history and contemporary literature on spirituality within the pastoral care tradition. Topics include the differentiation between spiritual direction and pastoral care; the history of the cure/care of souls; feminist spirituality, African American spirituality, and spirituality from the margins. [3] Miller-McLemore.

3084. Readings in Heinz Kohut and Self-Psychology. Investigates the writings on self-psychology of theorist and analyst Heinz Kohut with attention to the implications of his ideas about the formation and fragmentation of the self for 1) individual health and development; 2) cultural context; and 3) psychotherapy and pastoral care and counseling. Evaluation of the theory in conversation with various critical theological perspectives. [3] Miller-McLemore.

3086. The Pastoral Theology of Lutheran Tradition. Explores the pastoral theology within the texts and praxes of the early Lutheran tradition. Particular attention to Martin Luther's writings regarding care for and the overcoming of suffering. The anthropology assumed in this historic tradition compared to the anthropologies assumed in the relational psychoanalytic psychologies of our time. Implications for important issues in constructive, historical and pastoral theology examined, e.g., God and human suffering, mutuality in pastoral care, society and the common good. [3]

3087. Practical Theology and Historical Theology . Explores the relationship between practical theology and historical theology. Special attention given to the place of historical consciousness in the writings of Schleiermacher, H. R. Niebuhr, Gadamer, and select pragmatists. Consideration of the practical theological implications of various social and intellectual histories (e.g., accounts of pietist women reformers in eighteenth-century Germany, activities of American antislavery religious movements, perspectives on children in the history of Christian thought). Various proposals to construct a critically historical, socially transformative, practical theology examined. [3]

3088. Community Religious Belief/Practice. Intensive analysis of research in practical theology and community psychology. Methodologies of both disciplines used for individual proposals of research. [3]

3099. Pastoral Care for Addictions and Mental Disorders. In-depth examination of pastoral ministry for those suffering with clinically diagnosable addictions and major mental disorders. Close attention given to the theological and biopsychosocial dimensions of these afflictions. Strategies for pastoral and congregational care for those suffering with these disorders examined. Prerequisite: 2550. [3]

3752. The Religious Self According to Jung. 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. The life and thought of Jung as illustrated by his autobiography, *Memories, Dreams, Reflections*. His theory as a means to understand religious phenomena. [3] Gay.

3755. Critical Issues in Psychotherapy. Examination of key areas of psychotherapy including: patient's experience of therapy; unconscious thought processes in therapy; interpretation as intervention; transference and the interpretation of transference. [3] Gay.

3756. Seminar: Research in Religion and Health. Examination of empirical studies of religion and health. Explores claims and findings about the association of religious beliefs and practices to health beliefs, practices, and outcomes. Close attention paid to the theological assumptions of these empirical studies. [3]

3757. Seminar: Methods in Religion and Personality. Focus on the relationship of theology and science in general and religion and personality theory specifically. Uses several classic models as illustrative of the ways that persons have attempted to bring these two, sometimes similar, sometimes disparate, disciplines and enterprises together . Students should expect to apply these methods to their own projects in the field. [3] Miller-McLemore.

3760. Clinical Seminar. An ongoing case conference required of all Ph.D. students in Religion and Personality. [0–3] Miller-McLemore, Staff.

3960. Special Topics in Religion. [3]

3961. Special Topics in Religion. [3]

3970. Readings in Religion and Personality. [1–3] Staff.

3971. Reading Course in Pastoral Theology. [1–3] Staff.

3971.02. Seminar in Death and Dying. Addresses the issues of theology and pastoral practice that pertain to ministering to the dying and the bereaved. Participants will have opportunities to consider and to clarify their theological postures regarding theodicy, eschatology, sin and sickness, prayer, suicide, euthanasia, and hope. The course also will examine how one's theological commitments translate into authentic acts of care such as accompanying the dying, offering support to the bereaved, and assisting the family in making decisions. [3] Vaughn.

XI. Theological Studies

Interpretation, Language, and Belief

2505. Religious Autobiography. Considers the genre of autobiography and the roles of memory and belief in constructing narrative; students will read from the classics of Christian, Jewish, and Native American autobiographies, as well as from other religious traditions, to determine how race, class, gender, and sexuality affect the portrayal of religious experiences. [3] D. Sasson.

3192. Theology in the United Methodist Tradition. The history of theology in the United Methodist tradition, beginning with John Wesley and the rise of English Methodism in the eighteenth century. The major doctrinal concerns that have characterized Methodism historically and its position on several social concerns. The English scene, concluding with the death of John Wesley in 1791. The American theological tradition. [3] Meeks.

3308. Theology of Education. Classical and contemporary theories of education, focusing on theological interpretations of the educational process and on religious dimensions of teaching. [3]

3309. Gender, Theology, and the Religious Imagination. Explores the influence of gender (as both difference and identity) on Western theological discourse and the human religious imagination. This exploration is guided by the notion that there is much work left to do in unveiling the impact of gender in its broadest sense on where we've been, where we want to go, and how we're going to get there—religiously speaking. Particular emphasis will be placed on naming the influence of gender on theological understandings of self, world, and god. A second major emphasis will be to explore the ways in which religious experience and community reflect gendered priorities. Questions related to the pursuit of gender equality will be used to frame the course as a whole. [3]

3310. Men, Masculinities, and Religion. How have androcentric, male-supremacist forms of masculinity shaped, and been shaped by, religion in the West? Recent thinking from the critical study of men and masculinities (men's studies) will be engaged to explore this set of questions. Specific attention given to R. W. Connell's "hegemonic" masculinity, the diversity of men's experience *qua* men (race, sexual orientation, etc.), and the male body and/in religion. [3]

3312. Evolution of Religion and Science. Interactions between science and religion from antiquity to Charles Darwin. Subsequent modifications of Darwinism and religious responses to evolutionary theories. [3] Cherry.

3334. Theology and Hermeneutics. Modern and postmodern theories of interpretation and their significance for theological method. [3]

3335. Religious Language. Symbol, metaphor, and analogy in literary theory, linguistic analysis, and theology. [3]

3537. The Holocaust: Representation and Reflection. Explores fundamental questions about the nature of history and representation, the nature of the human and the divine, that the Holocaust raises. Prerequisite: 3524 or its equivalent. [3] Geller.

3960. Special Topics in Religion. [3]

Current Issues in Systematic and Philosophical Theology

2656. Constructive Christian Theology I. Introduction to the discipline of theology, with practice in reading texts in the field, formulating critical positions and enhancing theological thinking and writing skills. Emphasis will be on the constructive development and reformulation of the major interconnected themes of Christian theology, considered in relation both to the doctrinal tradition and to the challenges of the contemporary context. Themes for the first semester will include the nature and tasks of theology, scripture and authority, the doctrine of God, creating and the relation of God to the world, and Christology. Prerequisite: 2503, 2511, 2701, and either 2703 or 2704. [3] Meeks.

2657. Constructive Christian Theology II. The expansion of Christianity, the development of doctrine, relationships with the Roman Empire, development of church institutions, and changing modes of Christian life from the second century into the Middle Ages, with emphasis on the periods and themes that are formative of the classical doctrines and institutional patterns. Major purpose of the course is to establish the background for the division of the Western church and the subsequent development of the Roman Catholic and Protestant churches. [3] Thatamanil.

3311. Modern Critics of Religion. An examination of the relationship between the critique of religion and the understanding of modernity. Focus on the writings of Feuerbach, Kierkegaard, Marx, Nietzsche, and Freud. [3] Geller.

3312. Theologies, Traditions, and Difference. Contemporary concerns with the historical marginalization of particular groups in North American society have resulted in much attention to the topic of "difference," whether it be ethnic, religious, racial, class, sexual, gender, or other markers of particularity. This course looks at how three important traditions have framed and responded to these issues—liberal political, Christian theological, and postmodern. Not typically read together, these theories offer modes of ethical and communal thinking and will shape the focus of the course in its investigation of how communities ought to engage difference within and beyond their bounds. Seminar. Readings will include Johan Rawls, Kent Greenawalt, Donald Moon, William Connolly, Derrida, A. MacIntyre, John Yoder, John Milbank, and S. Welch, among others. [3]

3315. Creation and Ecology. Recent theological treatments of creation in light of ecological crises and scientific-technological developments. Readings include various views of nature, evolution, and biogenetic intervention and differing theological responses. [3] Meeks.

3316. The Doctrine of God. Surveys an array of contemporary constructions of the doctrine of God from a variety of theological standpoints: process, trinitarian, postmetaphysical,

narrative, revisionist, feminist, and others. Particular attention given to issues of epistemology, metaphysics, and the tension with classical constructions. [3] DeHart.

3317. The Doctrine of the Trinity. Classical and modern formulations of the doctrine of the Trinity, with reference to questions concerning divine process, the relation of God and the world, and the problem of belief in God. [3] DeHart.

3318. Economy and Theology. Critical retrieval of biblical and trinitarian understandings of the "economy of God" in relation to contemporary economic theory. Focus on the church's response to major economic problems related to property/inclusion, work/income, and consumption/sustainability. [3] Meeks.

3319. Ecclesiology. The study of recent theologies of the church with concentration on the nature, sacraments, ministries, and mission of the church in twenty-first century societies. [3] Meeks.

3320. Christology. Contemporary theologies of the life, work, death, resurrection, and presence of Jesus Christ. Focus on ways in which views of salvation, self, society, and nature interact with the memory of Israel's Jesus. Readings from Jewish, eschatological, feminist, black, and ecological perspectives. [3] Meeks.

3321. Process Theology. Contributions made to Christian theology by the tradition of process thought, and the questions raised for process thought by the character of Christian theology. [3]

3322. Theology of World Religions. The recent interreligious dialogue and its implications for Christian theology. The way in which global religious pluralism affects the nature and task of theology and the relation among major world religions as claims to truth. [3]

3323. Spirit, Community, and Social Theory. Study of the doctrine of the Holy Spirit in contemporary theology in dialogue with recent social theories (Bourdieu, Walzer, McIntyre, Taylor, Milbank). Focus on problems of embodiment, identity, law, language, community formation, gifting, etc. [3] Meeks.

3326. Seminar: Philosophical Theology. Subject: Hegel and Whitehead. [3]

3327. Contemporary Theology. The major movements in Christian thought from the beginnings of dialectical theology to the present. [3] DeHart.

3328. Eschatology and Apocalypse in Modern/Postmodern Theology. The development of eschatological and apocalyptic theology in relation to the modern and postmodern experience of evil, guilt, and death. [3] Meeks.

3330. Theology and Contemporary Continental Philosophy. Addresses the important figures in contemporary continental thought whose contributions are particularly significant in the study of theology; among the philosophers and theorists who will be studied are Jacques Derrida, Michel Foucault, Giorgio Agamben, Emmanuel Levinias, Luce Irigary, and Julia Kristeva. [3] Armour.

3331. Theology of Nature. A study of issues that arise when a theological perspective is brought to bear on the subject of nature: ecology and the destruction of the environment, the nature of human beings in evolutionary and biological perspective, and the activity of God in the operations of nature. Works in the history, philosophy, and theology of nature are consulted. [3]

3338. Communities, Traditions, and Difference. Contemporary concerns with the historical marginalization of particular groups in North American society have resulted in much attention to the topic of "difference," whether it be defined around ethnic, religious, racial, class,

sexual, gender or other markers of particularity. Key in determining the way a community deals with differences is its account of tradition and traditioning. This course will explore the relation of accounts of tradition/traditioning to difference in the work of selected contemporary theologians and philosophical ethicists and compare these to the same issues in selected political theorists. Readings from such theologians as E. Farley and J. Yoder, philosophical ethicist A. MacIntyre, and political theorists D. Moon and W Connolly. [3]

3339. Latin American Theology. A survey of theological production in Latin America, Catholic and Protestant, with a focus on Liberation Theology —origins and development, concerns and parameters, critical reception and present status. [3] Segovia.

3340. Feminist Theology. Introduces students to the classic texts and themes of feminist, womanist, and mujerista theologies as well as to current issues and important texts on the relationships among sexuality, gender, and race, the validity of "women's experiences" as sources for feminist theological reflection, and feminist critiques and reconstructions of traditional theological loci. [3] Armour.

3342. Feminist Hermeneutics. The revisionary interpretation feminists are currently proposing in such areas as literary theory, anthropology, psychology, ethics, and philosophy and their possible effect on contemporary theology and biblical analysis. [3]

3349. The Religion of George Eliot. Religious themes and theological motifs in selected novels of George Eliot, *Scenes of Clerical Life, Adam Bede, Romola, Middlemarch, Daniel Deronda*. [3]

3350. Postliberalism in Theology. An introduction to some influential texts associated with "post-liberalism," especially those stemming from the so-called "Yale School" (Frei, Lindbeck). Attention directed to the nature and identity of postliberalism as a theological trend, its opposition to "liberalism," and the controversy it has occasioned. [3] DeHart.

3351. Readings in Theological Postmodernism. What is "postmodernism" and what is it doing in theology? An attempt to answer this question by reading some basic interpretations of the postmodern as it relates to philosophy and theology, and by indicating some of the varied ways in which this chameleon-like set of concerns is currently shaping theology. [3] DeHart.

3352. Paul Tillich and the Future of Theology. This course will engage in close readings of Paul Tillich's three-volume *Systematic Theology* with the following questions in mind: what is Tillich's role in the future of Christian Theology? In what ways must Tillich's project be modified if it is to be viable for any future constructive Christian theology? How does our knowledge of the world's religious traditions require a rethinking of content and structure of Tillich's system? [3] Thatamanil.

3353. Comparative Theology: South Asia. The purpose for this course is twofold: 1) to introduce students to major South Asian traditions, texts, and thinkers in the Hindu and Buddhist traditions in theological depth; likely thinkers to be discussed include Nagarjuna, Sankara, and Ramanuja; 2) to introduce methods for the emerging field of comparative theology; thinkers to be considered here include Francis X. Clooney, S. J. and Robert C. Neville. [3] Thatamanil.

3355. Hindu-Christian Dialogue. Introduces students to basic texts and motifs of Hindu religious traditions and then brings specific texts, themes, and thinkers into dialogue with Christian theology. Central themes to be considered include samsara, moksha, devotion, karma, liberating knowledge, meditation, nondualism, and varieties of Hindu theism. The course will examine vernacular literatures as well as classical Sanskrit texts. The course will also take up present tensions between Hindus and Christians on conversion, caste and communalism. The course will conclude with readings from contemporary Christian theologians who do theology in conversation with Hinduism. Likely figures may include Raimon Panikkar, Francis X. Clooney, and Sathianathan Clarke (Dalit theology). [3] Thatamanil.

3356. Buddhist and Christian Dialogue. Introduces students to the rich theoretical and contemplative fruit of the continuous dialogue that has been flourishing for several decades between Buddhists and Christians. Following an intr oduction to Theravada and Mahayana Buddhism through a close reading of selected primary sources, we will read Christian thinkers who engage those primary sources while asking, "What can Christian theologians lear n from Buddhism?" Much of the "dialogue" between Buddhists and Christians has transpired in silent meditation. Students will be introduced to practices of Buddhist meditation and Christian contemplative prayer; they will be encouraged to consider what these rich practices teach us about each tradition's experience of the way events ar e. Conversation with Buddhists inevitably raises the most searching and profound questions for Christians. Is it possible to be religious without reference to an ultimate Divine being? If so (and Buddhists do just this), then what are the implications of such non-theistic "spirituality" for Christian thinking? Ar e Buddhists and Christians taking different paths to the same destination, or is each r eligious tradition committed to a good not to be found in the other? Can dialogue between traditions lead to a mutual transformation of Buddhism and Christianity? [3] Thatamanil.

3357. God and the Other in Relational Theology. The theme of otherness has acquired central importance in much r ecent philosophy and theology. As an ethical theme, philosophers such as Emmanuel Levinas, call us to defer to the absolute dignity and inviolability of the Other. Theologically, the encounter with the face of the Other is said to be site of our encounter with God. But ontologically, there is a fundamental question to be addressed: Is it meaningful to speak of the neighbor as radically Other? Ar e not self and other co-constituted in and through relationship? If that is true, then in what sense can we speak of deferring to the absolute priority of the Other? Perhaps God is encounter ed not in the Other but in the "between" where self and other meet and become. In summary, how are we to think together these two profound notions, relatedness and otherness? This course will explor e otherness and relationality in philosophy and theology . In philosophy, we will begin by r eading Martin Buber, Emmanuel Levinas, and the Buddhist thinker of r elationality, Nagarjuna. We shall then consider how these themes have been and might yet be appr opriated in contemporary constructive theology. Our conversation par tners will include Catherine Keller , Anslem Min, F. LeRon Shults, and John Zizioulas. [3] Thatamanil.

3833. Postcolonialism and Christian Studies. Analysis of relationship between Postcolonial Studies and Theological Studies in the contemporar y world. Focus on theological production of non-Western world and of non-Western minorities in the West. [3] Segovia.

3858. Thomas Aquinas. Systematic investigation of Aquinas' major theological and philosophical assertions by considering his conception of the two disciplines and their r elationships. All readings will be available in English translations. [3] DeHart.

3908. Seminar in Systematic Theology: Christology. Students in this advanced seminar will explore the contemporary theologies of the life, work, death, r esurrection, and presence of Jesus Christ; class sessions will addr ess the ways in which views of salvation, self, society , and nature interact with the memory of Israel's Jesus. The readings for the seminar will include Jewish, eschatological, feminist, black, and ecological perspectives. [3] Meeks.

3923. God in the Western Tradition. The major philosophical and theological texts of the Western tradition from Plato to the twentieth century. The changing history of the interpretation of God from Christian neoplatonism to nineteenth- and twentieth-century challenges of classical approaches. [3] DeHart.

3924. Becoming Divine: Easter n Orthodox Theology and Spirituality . This course will engage Eastern Orthodox Theology and spirituality and ask what resources this tradition has to offer for contemporary constructive Christian theology and spirituality. The contributions of

Athanasius, Nyssa, Pseudo-Dionysius, Maximus, and Palamas. This course will also engage contemporary theologians who engage components of the Orthodox tradition like Vladimir Lossky and Jean-Luc Marion. [3] Thatamanil.

3960. Special Topics in Religion. [3]

3983. Reading Course in Systematic Theology. [1–3] Staff.

3984. Reading Course in Philosophical Theology. [1–3] Staff.

3987. Readings in Religion/Gender/Sexuality. [1–3] Staff.

Theology and the Christian Tradition

3196. Theology in the Reformed Tradition. The doctrine and theology of the Presbyterian or Reformed Churches from the Reformation to the present in historical context. Classic confessions of faith, influential thinkers (e.g., Calvin, Edwards, Schleiermacher, Barth), schools of thought (e.g., federal theology, Consistent Calvinism, evangelicalism), movements (e.g., Puritanism, revivalism, liberalism), and problems (e.g., ecclesiology, church and state, apartheid). Distinctive aspects of the Reformed tradition, its relevance for contemporary life and thought, and contributions which it can make to ecumenical dialogue. [3]

3325. Protestant Theology in the Nineteenth Century. Major movements in Protestant thought during the nineteenth century, from Schleiermacher to Troeltsch. [3] DeHart.

3327. Contemporary Theology. The major movements in Christian thought from the beginnings of dialectical theology to the present. [3] DeHart.

3333. Theology of Karl Barth. An introduction to the thought of one of the most important and controversial theologians of the twentieth century. [3] DeHart.

3346. Kierkegaard the Theologian. An advanced exploration of Kierkegaard's philosophy of Christian belief, with particular attention to his analysis of faith, the relation of ethics and religion, sin and human existence, and his metaphysical and theistic assumptions. Based on close reading and classroom analysis and discussion of selected texts from the pseudonymous authorship. [3] DeHart.

3912. Mystical Literature from Plotinus to John of the Cross. Traces the various inflections of what emerges as a strikingly unified tradition of discourse about the experience of union, *unio mysticus*, across the Middle Ages from Plotinus to John of the Cross. Particular emphasis placed on apophasis, or the failure of language, prior to this experience. [3] Franke.

3918. Schleiermacher. The theology of Schleiermacher, with special focus on *The Christian Faith.* Attention to Schleiermacher's theological method, to selected major doctrines, and to the overall structure of his theology. Other works of Schleiermacher pertinent to these studies: the *Speeches*, the *Lücke Letters,* and the *Hermeneutic.* [3] DeHart.

3960. Special Topics in Religion. [3]

3961. Special Topics in Religion. [3]

3981. Reading Course in Historical Theology. [1–3] Staff.

Social Psychology

☙ THE interdisciplinary program in social psychology provides doctoral students with the opportunity to pursue either a major concentration or a minor in social psychology. Students choose a major concentration in social psychology through the graduate program in psychology, sociology, or management (organization studies). A minor may be chosen through these programs as well as community research and action or psychology and human development. The program is coordinated by an interdisciplinary faculty committee composed of William P. Smith and Kenneth A. Wallston (*Psychology*), Bruce Barry, Jennifer Escalas, and Raymond Friedman (*Management*), Douglas D. Perkins (*Community Research and Action*), and Leonard Bickman (*Psychology and Human Development*).

Students are admitted to and earn the Ph.D. degree in one of the participating disciplines and complete a minimum of five courses related to social psychology offered by the programs and approved by the interdisciplinary committee. In addition, participants enroll in an interdisciplinary seminar in social psychology for at least three semesters. (See program Web site *www.vanderbilt.edu/socialpsych* for a current list of electives and the seminar schedule.) Students choosing a major concentration conduct their dissertation research in social psychology.

Prospective students should apply for admission in psychology, sociology, or management and indicate on the Graduate School's application their interest in social psychology. Individuals already studying in these disciplines may elect at any time to complete a major or minor concentration in social psychology, and those in community research and action or psychology and human development may satisfy a minor concentration by enrolling in the required course sequence.

Core Seminar

PSYCHOLOGY: 361, Interdisciplinary Seminar in Social Psychology. May be repeated.

Sociology

CHAIR Gary F. Jensen
DIRECTOR OF GRADUATE STUDIES Karen E. Campbell
PROFESSORS EMERITI Ernest Q. Campbell, Jack P. Gibbs, Walter R. Gove, Richard A. Peterson
PROFESSORS Daniel B. Cornfield, Katharine Donato, Larry W. Isaac, Gary F. Jensen, Holly J. McCammon, Ronnie Steinberg
ASSOCIATE PROFESSORS George Becker, Karen E. Campbell, Monica J. Casper, James J. Lang
ASSISTANT PROFESSORS Tony Brown, Laura Carpenter, Michael Ezell, Shaul Kelner, Jennifer Lena, Richard Lloyd, Richard Pitt, Steven J. Tepper
SENIOR LECTURER Maryaltani Karpos

DEGREES OFFERED: *Master of Arts, Doctor of Philosophy*

☙ THE sociology program prepares students for research and teaching careers in academic and policy settings. Students are exposed to a wide range of sociological works and research methods. Emphasis is on becoming an independent social researcher and teacher. Students have an opportunity to work closely with faculty members, in part because of a low ratio of graduate students to faculty members (roughly a one-to-one ratio).

The master's program consists of 36 hours of required course work: 301, 302, 310, 311, 312, one methods seminar, two survey seminars, one special topic seminar, and 9 hours of electives. Also, students must write a master's paper by the end of their fourth semester in order to receive a master's degree.

Students must satisfy all of the master's degree requirements in order to receive a Ph.D. In addition, Ph.D. degree course work requirements consist of 323 and 34 hours of electives (up to 20 hours of which may be 399). Students must pass two special area exams, defend a dissertation proposal, complete a dissertation, and defend a dissertation in order to receive a Ph.D. degree.

Students may transfer up to 30 credit hours of eligible, graduate course work performed at another institution, subject to the approval of the director of graduate studies, the department chair, and the Graduate School.

204. Self, Society, and Social Change. Problems and prospects for individual participation in social change; volunteering, community service, and philanthropy; role of individuals and voluntary associations in social change. SPRING. [3] Cornfield.

220. Population and Society. The mutual influence of demographic factors and social structure. Trends in fertility, mortality, population growth, distribution, migration, and composition. Population policy and national development. FALL. [3] Donato.

224. Women and Law. History of laws subordinating women and efforts by feminists to achieve substantive and procedural equity. American historical examples augmented by comparative research. Examines employment law, laws making rape and domestic violence illegal, and tax law. [3] (Not currently offered)

230. The Family. 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. FALL. [3] Karpos.

231. Criminology. The nature, distribution, causes, and control of crime with emphases on contemporary American society and a broad range of types of crime. SPRING. [3] Becker.

232. Delinquency and Juvenile Justice. The nature, distribution, causes and control of juvenile delinquency and the operation of the juvenile justice system in contemporary American society. FALL. [3] Jensen.

233. Deviant Behavior and Social Control. 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. FALL. [3] Noble.

234. Prison Life. Prison life from the perspective of prisoners, officials, and the society in which they operate. SPRING. [3] Noble.

235. Contemporary American Society. Shifts in the political, economic, and social structure of the United States; changes in technology, demography, and social mores. SPRING. [3] Lloyd.

236. Class, Status, and Power. Analysis of the competition for jobs, advancement, and income. The influence of social background, education, politics, race, sex, changes in the national economy, and other factors will be considered. Theoretical and empirical analysis focusing on the United States. [3] (Not currently offered)

237. Society and Medicine. 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] (Not currently offered)

238. Social Problems of American Medicine. Problems of medical care in the United States in terms of their historical development and of their sociological concepts and principles. [3] (Not currently offered)

240. Law and Society. Examines the relationship between the legal system and other institutions with illustrations drawn from both American and other societies. The actual operation of the legal system including lawyers, courts, and police is described. SPRING. [3] McCammon.

241. Art in Society. A description of the process of creating, displaying, merchandising, and evaluating art. Analysis of artist circles, production companies, training centers, patrons, critics, dealers, audiences, and government influences in the contemporary American scene as well as in other times and places. [3] (Not currently offered)

242. The Urban Community. Social organization of the urban community. Historical and contemporary patterns in the structure and growth of the city. World urbanism and social change. SPRING. [3] Lloyd.

243. Revolutions in the Modern World. From the French Revolution to the breakdown of communism and the rise of radical Islamic movements. Diffusion and transformation of challenging strategies and ideologies. Developmental paths opened or altered on a global scale. Links to domestic terror and international terrorism. [3] (Not currently offered)

244. Politics, State, and Society. Topics include the political effects of bureaucratization, social conditions necessary for democracy, the political implications of technological changes,

structural differentiation and conflict among elites. Attention is given to for mal models of political processes, such as those of conflict and coalition formation. [3] (Not currently offered)

245. Music in Society . Production, use, and evaluation of music as social pr ocesses and shared practices. How music expresses status and identity. Making music together and making musicians. The impact of changing technology on music. Pop, rock, classical, jazz, country, hip hop, salsa, blues, alternative, and folk music. [3] (Not currently offered)

246. Sociology of Religion. Theories of the nature, function, and structure of religion. Religion in America, including fundamentalism, the Black Chur ch, and cults. How r eligion changes and is changed by secular society. FALL. [3] Pitt.

247. Human Behavior in Organizations. Organizations are treated as resources in the production and distribution of goods and services. Case analyses fr om the economy ar e reviewed to diagnose "organizational pathologies" and to understand r eciprocal impacts among organizational structures, leaders, and citizens. [3] (Not currently offered)

248. Popular Culture Dynamics. Examination of theories and research that link culture and society. Consideration of the mass media ar ts with particular emphasis on popular music. Focus on creators, industry, and audiences. SPRING. [3] Lena.

249. American Social Movements. The effect of key social movements on American society. Comparison of the organization and success of movements such as the American Revolution, Southern Secession, Populism, Woman's Suffrage, and Civil Rights. SPRING. [3] Isaac.

250. Gender in Society. Theoretical approaches to gender relations with a focus on the contemporary U.S. Evolution of gender ster eotypes, gender socialization over the life course, gender in social interactions, institutional sour ces of gender inequality, and intersections of gender with race, social class, and sexual identity . Topics include work, school, families, health, and intimate relationships. [3] (Not currently offered)

251. Women and Public Policy in America. 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 patter ns on the family; birth control, abortion, and health care policies; child car e; participation of women in political pr ocesses; divorce, child support, and custody; affirmative action policies; present governmental remedies and proposed alternatives. FALL. [3] Campbell.

254. Schools and Society: The Sociology of Education. How schools affect individuals and relate to institutions: the gover nment, the economy, social classes, and families. How social attributes, including race and class, af fect academic achievement. Contr oversies such as desegregation and intelligence testing. SPRING. [3] Pitt.

255. Racial and Ethnic Minorities in the United States. 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. FALL. [3] Pitt.

257. Gender, Sexuality, and the Body. 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 r eflexive project and as the site of historical and ideological significance. We address race, ethnicity, physical abilities, and class in explaining variations in cultural ideals. SPRING. [3] Carpenter.

258. The South in American Cultur e. The changing relationship between the South and the rest of the countr y and its effects on understandings and definitions of the South, and changes in southern social structures and patterns, race relations, and economic and political institutions. [3] (Not currently offered)

260. The Individual and Society. How individuals, as social beings, are created by society, and how society is in turn created and sustained by individuals. The social self, stigmas, deviance and identity, social structure and personality, small group processes, collective behavior. [3] (Not currently offered)

261. Work and Family in American Life. The changing relationship between work and family from the Colonial era to the present. Role of the U.S. corporation, specialization of the family, sex roles, social mobility. [3] (Not currently offered)

262. Interpersonal and Intergroup Relations. An examination of social psychological literature related to intergroup and interpersonal conflict and its resolution, with special attention to problems of relations between black and white in contemporary society. [3] (Not currently offered)

263. Religion, Science, and the Paranormal. Critical study of paranormalism as a belief system at the fringes of science and religion. SPRING. [3] Jensen.

264. Social Dynamics of Mental Health. 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. FALL. [3] Brown.

265. Psychological Anthropology. (Also listed as Anthropology 265) How personality and culture affect each other. Socialization and the life cycle, the definition of sex roles, individual psychology and group aggression, religion and group personality, and the nature of mental illness and normalcy in non-Western societies. [3] (Not currently offered)

270. Human Ecology and Society. Demographic growth, social organization, technology, and the global environment. Sustainable agriculture, ecological degradation. Urban waste and recycling. Community-based approaches to development in Asia and Latin America. FALL. [3] Lang.

272. Gender Identities, Interactions, and Relationships. 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] (Not currently offered)

277. Contemporary Latin America. 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] (Not currently offered)

278. Comparative Asian Development. Emphasis on modern India, China, and Japan. Current history and long-term trends. Religious, social, and artistic traditions. Models of modernization; dilemmas of development; challenges of globalization. [3] (Not currently offered)

281. Development for a Small Planet. Community-based approaches to public health, food production, and education. Appropriate technology; creating sustainable life styles; dilemmas of big development. Examples from Asia, Africa, and the Americas. SPRING. [3] Lang.

294. Seminars in Selected Topics. Topics of special interest, as announced in the *Schedule of Courses*. May be repeated for credit once if there is no duplication of topic. [3] (Not currently offered)

301. Classical Theory. Theoretical perspectives and theorists in the early history of sociology, focusing primarily on Durkheim, Marx, and Weber. [3] (Not currently offered)

302. Contemporary Theory. Modern developments including neo-Marxist, functionalist, structuralist, conflict, interactionist, exchange/rational choice, and feminist theories. [3] (Not currently offered)

310. Sociological Inquiry. Introduction to research methods, including theory construction, sociological reasoning, study design, and specific research techniques. Normally limited to graduate students in the department. FALL. [3] McCammon.

311. Multivariate Analysis I. Basic concepts in probability and statistical analysis. Multivariate analysis of sociological data, with special attention to regression analysis. The use of computers. Prerequisite: enrollment in graduate program in sociology or permission of the instructor. FALL. [3] Brown.

312. Multivariate Analysis II. The general linear model in analyzing sociological data, including analysis of variance, regression, path analysis, and parametric techniques for contingency-table analysis. Practice in the use of computers. Prerequisite: 311 or an equivalent statistics course approved by the instructor. SPRING. [3] Brown.

313. Quantitative Methods Workshop. Analysis of large data sets from the social sciences or of data brought to the course by students. Scaling and measurement; nonparametric analysis of contingency tables; and advanced topics in regression and path analysis. Prerequisite: 312 or an equivalent statistics course approved by the instructor. FALL. [3] Ezell.

323. Teaching Workshop. For students wanting to improve their teaching skills. Students visit the classrooms of outstanding teachers on campus and discuss their approach to teaching; deliver lectures in the presence of critics; examine their own lectures on videotape; discuss methods of evaluation; read outstanding books on college teaching; and survey teaching materials produced by the American Sociological Association. Normally limited to graduate students in the department. Graded P/F only. SPRING. [3] Campbell.

Courses numbered 331–347 are taught as "survey seminars." Course assignments aim at giving students breadth, and, to that end, a wide range of readings are covered in a seminar format. One of these seminars is usually offered each semester.

331. Survey Seminar on Inequalities and Movements. Relationship between multiple forms of social inequality, such as class, race, and gender inequality, and related social movements. [3] (Not currently offered)

333. Survey Seminar on Cultural Sociology. The creation of culture, including values, norms, beliefs, symbols, and life-styles. The reproduction of society through culture; institutions that purposefully preserve, produce, and transmit aspects of culture. SPRING. [3] Lena.

335. Survey Seminar on Deviant Behavior and Social Control. Major works on crime, juvenile delinquency, and forms of extralegal deviance. Social control in connection with counteraction of deviance, sociology of law, and manipulation of human behavior. [3] (Not currently offered)

339. Survey Seminar on Political Sociology. Classical and modern theories about the nature and distribution of power in society and other human groups. The social bases and implications of major political institutions, the state in particular; collective behavior and social movements; and political order and change. [3] (Not currently offered)

341. Survey Seminar on Population Studies and Human Ecology. Population processes, elements of social organization, and their interaction. Major theories and research pertaining to fertility, mortality, migration, urbanization, urban structure, technology, and the division of labor. [3] (Not currently offered)

343. Survey Seminar on Social Psychology. The interaction of social structure and personality. Socialization, social perception, small groups, exchange theory, and symbolic interactionism. [3] (Not currently offered)

345. Survey Seminar on Social Stratification. Major theories and lines of research pertaining to the origin, nature, and functioning of systems of social inequality. [3] (Not currently offered)

347. Survey Seminar on Sociology of Science and Knowledge. How ideas and systems of thought are related to the social structure and culture of societies. Institutionalization of scientific and intellectual activity, scientific and intellectual communities or organizations, and social influences on the directions of research by scientists and academicians. [3] (Not currently offered)

Courses numbered 361–371 treat "special topics" in sociology. Title and focus of each seminar depends on the interests of students and the faculty. In all, students are expected to engage in research, design research, or undertake some other kind of creative work, and report the product in a semester paper. One usually offered each semester.

361. Special-Topic Seminars on Social Phenomena at the Macro Level. Each focuses on some aspect of social structure, social organization, culture, international relations, global systems, spatial organization, or the social division of labor. Cities, communities, urban areas, metropolitan areas, regions, countries, or status categories are the principal units of comparison. [3] (Not currently offered)

363. Special-Topic Seminars on Institutions and Organizations. Each focuses on some type of institution—economic, educational, familial, medical, political, or religious—or some type of organization, including business firms and voluntary associations. [3] (Not currently offered)

367. Special-Topic Seminars on Norms, Power, and Related Normative Phenomena. Each focuses on a particular type of deviance, the sociology of law, social control, or political sociology. [3] (Not currently offered)

368. Special-Topic Seminars on Social Processes and Social Change. Each focuses on collective behavior, social movements, innovation and diffusion, societal development, cultural evolution, revolutions, migration, mortality, fertility, or mobility. FALL. [3] Isaac.

371. Special-Topic Seminars on Theory and Methodology. Each focuses on a particular theorist, a particular theoretical perspective, the methodology of theory construction, or particular kinds of research methods and statistical techniques. SPRING. [3] Casper.

390a–390b. Directed Studies. Students work independently on topics of special interest not covered in depth in course offerings. Work in a tutorial relationship with an individual faculty member or in a student seminar, subject to faculty approval, should several students share a common interest. Prerequisite: consent of the instructor. FALL, SPRING. [Variable credit: 1–3 each semester] Staff.

395a–395b. Research Practicum. Research with the guidance of individual faculty members on problems of mutual interest. [3–3] Staff.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Spanish and Portuguese

CHAIR Cathy L. Jrade
DIRECTOR OF GRADUATE STUDIES Benigno Trigo
PROFESSORS EMERITI J. Richard Andrews, John L. Bingham, John Crispin, Russell G. Hamilton, C. Enrique Pupo-Walker, Francisco Ruiz-Ramón
PROFESSORS Earl E. Fitz, Edward Friedman, Cathy L. Jrade, William Luis, René Prieto, Philip D. Rasico
ASSOCIATE PROFESSORS M. Fráncille Bergquist, Susan Berk-Seligson, Victoria A. Burrus, Benigno Trigo, Andrés Zamora
ASSISTANT PROFESSORS Jason Borge, Carlos A. Jáuregui, Christina Karageorgou, Emanuelle K. F. Oliveira
SENIOR LECTURERS Frances Alpren, Tatiana Botero, Sarah Delassus, Chalene Helmuth, Paul Miller, Elena Olazagasti-Segovia, Raquel Rincón, Lorraine Sciadini, Waldir Sepúlveda, Cynthia M. Wasick

DEGREES OFFERED:

SPANISH. *Master of Arts, Doctor of Philosophy*
SPANISH-PORTUGUESE. *Doctor of Philosophy*
PORTUGUESE. *Master of Arts*

☙ THE M.A. programs in Spanish and in Portuguese each require 30 hours of course work. A reading knowledge of another foreign language is also required. (Credit for basic language courses taken do not count toward the degree. For Portuguese M.A. students, the required language is Spanish. For Spanish M.A. students, the recommended language is Portuguese. Students with a special academic interest in another language should request in writing approval from the director of graduate studies before enrolling in any language other than Portuguese.) A 45-hour double M.A. program is also available, in which a 30-hour M.A. in either Spanish or Portuguese is complemented with 15 additional hours of course work in the other field for the conferment of the second M.A. (No additional foreign language is required.)

The Ph.D. program in Spanish requires 60 hours of course work, which includes the 30 hours of the M.A. in Spanish and 9 hours for a minor, which may be Portuguese, a certificate program in Latin American studies, an interdisciplinary minor in philosophy and literature, or another approved program of courses from one or more departments. Candidates must demonstrate either a reading knowledge of an additional foreign language beyond the one required for the M.A. (which will normally have been Portuguese) or they may continue in the study of Portuguese (or another approved language) to an advanced level.

The combined Ph.D. in Spanish and Portuguese requires 66 hours of course work, which includes the 45 hours of the double M.A. described above and at least 9 additional hours in each of the two areas. No minor is necessary. Near-native proficiency in both Spanish and Portuguese is

required of all students enrolled in the combined program. There is no additional language requirement.

Spanish

214. Dialectology. 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 nonstandard dialectal varieties of Spanish. [3] Rasico. (Offered 2007/2008)

216. Phonology. 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. FALL. [3] Rasico.

217. Contrastive Analysis of Spanish and English. 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. FALL. [3] Bergquist.

218. Morphology and Syntax. 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. [3] Rasico. (Offered 2007/2008)

219. History of the Spanish Language. 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. SPRING. [3] Rasico.

220. The Languages of Spain. Origins, development, and the contemporary sociolinguistic situation of the principal languages and dialects of Spain, including Castilian, Catalan, Galician, and Basque. [3] Rasico. (Offered 2007/2008)

230. Development of Lyric Poetry. Popular and traditional forms; the sonnet and other Renaissance and Baroque classical forms. Romanticism. [3] Staff. (Not currently offered)

231. The Origins of Spanish Literature. 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. [3] Burrus. (Offered 2007/2008)

232. Literature of the Spanish Golden Age. Representative works from early modern Spain, including poetry, prose, and drama of the Renaissance and Baroque periods. [3] (Not currently offered)

233. Modern Spanish Literature. The eighteenth and nineteenth centuries: essays and Neoclassic literature, Romanticism, Realism, and Naturalism. Representative works and authors from all genres. [3] Zamora.

234. Contemporary Spanish Literature. Representative authors and works from the Generation of 1898 to the present. [3] Staff. (Not currently offered)

235. Spanish American Literature. The development of all forms from colonial times to World War I. The different patterns of interaction of native American, African, and European cultural traditions. The unity and diversity of Spanish American literature. [3] Jáuregui, Trigo. (Offered 2007/2008)

236. Contemporary Literature of Spanish America. All literary forms from World War I to the present. Emphasis on the works of Neruda, Borges, Paz, García Márquez, and others. SPRING. [3] Jrade, Jáuregui, Prieto, Trigo.

237. Contemporary Lyric Poetry. From Modernism to the present in Spain and Spanish America. FALL. [3] Karageorgou.

239. Development of the Novel. From the seventeenth century through Realism and Naturalism in Spain and Spanish America. [3] Zamora. (Not currently offered)

240. The Contemporary Novel. New forms in the twentieth-century novel in Spain and Spanish America. [3] Staff. (Not currently offered)

244. Afro-Hispanic Literature. From nineteenth-century slave narrative to modern writers such as Miguel Barnet, Alejo Carpentier, and Quince Duncan. [3] Luis. (Not currently offered)

246. *Don Quixote*. Directed reading and intensive study of the novel. [3] Friedman. (Offered 2007/2008)

251. Development of Drama. Spanish theatrical works from 1600 to 1900, including the Golden age *comedia*, neoclassicism, romanticism, and early realism in drama. SPRING. [3] Friedman.

256. Love and Honor in Medieval and Golden Age Literature. 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. [3] Burrus. (Not currently offered)

260. Development of the Short Story. From early manifestations in Spain through its current forms in Spain and Spanish America. SPRING. [3] Friedman, Prieto.

272. Love in the Latin American Novel. Conceptions of love in Latin American novels beginning in the nineteenth century. The effect of history, race, and morals on the shaping of affective response. FALL. [3] Prieto.

276. Going Native in Latin American Literature and Film. Intersections among literature, cinema, anthropology, and cultural theory, through selected movies and texts from different moments of Latin American cultural history. Ethnographic, historical, and literary narrations and films in which the encounter with the native "savage" causes the destabilization of identity for the "civilized" conqueror, missionary, captive, ethnographer, or traveler. [3] Jáuregui. (Not currently offered)

281. The Theory and Practice of Drama. Critical works and plays from different periods. Introduction to the principles of dramaturgy. [3] Friedman. (Offered 2007/2008)

289. Independent Study. 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. FALL, SPRING. [Variable credit: 1–3 each semester, not to exceed 12 over a four-semester period] Staff.

293. Contemporary Latin American Prose Fiction in English Translation. (Also listed as Portuguese 293) Major themes and techniques. No credit for graduate students in Spanish or Portuguese. [3] Fitz, Jrade, Trigo. (Not currently offered)

294. Special Topics in Hispanic Literature. [May be repeated for credit if there is no duplication of topic] FALL, SPRING. [3] Staff.

295. Special Topics in Spanish Language and Linguistics. Topics as announced in the *Schedule of Courses*. FALL, SPRING. [3] Staff.

296. Special Topics in Hispanic Culture. FALL, SPRING. [May be repeated for credit if there is no duplication of topic] [3] Staff.

301. Literary Analysis and Theory. (Also listed as Portuguese 301 and Comparative Literature 313) Methods of literary analysis for the teaching of literature. The systematic application of contemporary theories—structuralist and poststructuralist—in the analysis of poetry and narrative. FALL. [3] Zamora or Friedman.

302. Ibero-Romance Philology. (Also listed as Portuguese 302) Study of the evolution of the languages and dialects of the Iberian Peninsula. Analysis of selected linguistic developments and readings from medieval texts. SPRING. [3] Rasico.

310. Foreign Language Learning and Teaching. (Also listed as Portuguese 310) Principles and practices of teaching a second language, with concentration on recent interactive and communicative models of foreign language instruction. Goals of the course are 1) to introduce principles of Second Language Acquisition and learning, 2) to critically read relevant literature in the area(s), and 3) to develop FL instructor's awareness through reflective and critical thinking. Classroom observations, journal writing, development of materials, and a small action-research project are expected. Required of all entering teaching assistants. FALL. [3] Alpren.

314. Introduction to Latin American Colonial Studies. (Also listed as Portuguese 314) Provides a panoramic introduction to the canonical works of the colonial period from "discovery" to "independence," as well as an overview of the theoretical debates in colonial studies within the Latin American context. Topics include the construction and reshaping of *identities* and *otherness* through various stages of Latin American cultural history, the emergence of what has been called the American consciousness during the "New World Baroque," and the discourses of "independence" and early nation building. [3] Jáuregui, Fitz. (Not currently offered)

330. Survey of Medieval Spanish Literature. Introduction to major works of pre-modern Spanish literature through the fifteenth century. [3] Burrus. (Not currently offered)

331. Seminar: Studies in Medieval Literature. Topics as announced in the *Schedule of Courses*. [3] Burrus. (Not currently offered)

332. Love in Late Medieval Spanish Literature. Examination of the different conceptions and discourses of love in Spain during the fourteenth and fifteenth centuries. [3] Burrus.

333. Seminar: Modernismo. The major literary movement of the end of the nineteenth century and beginning of the twentieth century in the Spanish-speaking world. Major authors, their context, and the fundamental ideological and literary shifts evident in their works. [3] Jrade.

334. Ordering and Disrupting Fictions in Latin America. Fictions of the mid nineteenth and early twentieth centuries. The racialized and sexualized nature of these imagined communities and their uncanny tendency to disassemble themselves. SPRING. [3] Trigo.

335. The Spanish American Novel of the Boom Period. An examination of the Boom novel, from the 1960s: *La muerte de Artemio Cruz*, *Rayuela*, *La casa verde* or *Conversación en la Catedral*, *Tres tristes tigres*, and *Cien años de soledad*. [3] Luis.

336. Self-Writing in Latin America. Theory and practice of self-writing; memoir, testimony, autobiography in Latin America. The connection between the body, language, and memory in a subject of both national and individual dimensions. FALL. [3] Trigo.

337. The Melancholy Novel in Latin America. Construction of a melancholy subject built on the loss of a linguistic, sexual, and racial identity. The works of mourning and remembering of an abject maternal body. Texts by Latin American women writers and Latinas. FALL. [3] Trigo.

338. Seminar: Studies in Colonial Literature. (Also listed as Portuguese 338) [3] Fitz, Jáuregui. (Not currently offered)

340. Seminar: Hispanic American Essay. (Also listed as Portuguese 340) SPRING. [3] Jáuregui.

342. Seminar: The Baroque. Readings in Spanish baroque literature and culture, including works by Góngora, Quevedo, Cervantes, María de Zayas, Calderón, and Gracián. SPRING. [3] Friedman.

343. Seminar: Studies in Golden Age Drama. The *comedia nueva* in cultural and critical contexts. [3] Friedman.

345. Seminar: Early Modern Spanish Narrative. Readings in Spanish prose fiction from 1550 to 1700, including the picaresque tradition and works by Cervantes, María de Zayas, and other writers. SPRING. [3] Friedman.

351. Comparative Methodology. (Also listed as Portuguese 351) Comparative literature as an academic discipline; scholarly and theoretical distinctions; methodologies, applications, relationship to national literature units and humanities programs. FALL. [3] Fitz.

352. Seminar: Issues in Hispanic Cinema. Possible topics include: feminine reflections in contemporary Spanish cinema; Hispanic variations on the cinematic Bildungsroman; traveling films; delivering the nation (Spain 1975–2005). [3] Zamora, Borge.

353. The Literature of *Indianismo* and *Indigenismo*. The evolution of *Indianismo* and *Indigenismo* from the mid-nineteenth century to the present, and native Americans in works of literature. FALL. [3] Prieto.

354. The Politics of Identity in Latino U.S. Literature. The writings of Latinas/Latinos from the four largest groups: Chicanos, Cuban Americans, Puerto Rican Americans, and Dominican Americans. Redefinition of borders, cultures, and languages. [3] Luis.

361. Seminar: Studies in Eighteenth- and Nineteenth-Century Spanish Literature. A broad survey of specific topics such as: textual civil wars; literary constructions of the nation; reconstruction of the narrative genre (1700–1900); eccentricities of Spanish Enlightenment and/or Spanish Romanticism; theatrical spectacles. [3] Zamora.

362. Seminar: The Realist Novel of the Nineteenth-Century Spanish. A multifaceted approach to the Spanish Realist novel with attention to the sociopolitical context, contemporary cultural discourses and practices; European literary and artistic currents of the day, and theoretical formulations on the genre. [3] Zamora.

363. Seminar: Modern Spanish Poetry and Poetics. Key moments of Spanish lyric poetry during the nineteenth and twentieth centuries. Theory and praxis, Romanticism, Avant-Garde, and Post-Modernism. [3] Karageorgou.

369. Master's Thesis Research. [0]

372. Seminar: Studies in Twentieth-Century Spanish Literature. Topics as announced in the *Schedule of Courses.* SPRING. [3]

387. Seminar: Contemporary Spanish American Novel. SPRING. [3] Luis, Jrade, Prieto.

388. Special Topics in Spanish Literature. Topics as announced in the *Schedule of Courses.* FALL. [3] Friedman, Karageorgou, Zamora.

389. Special Topics in Spanish American Literature. Topics as announced in the *Schedule of Courses.* For list of previous topics, please see departmental Web page. FALL, SPRING. [3] Jrade, Luis, Prieto, Trigo.

396. Special Studies in Spanish Linguistics. FALL, SPRING. [Variable credit: 1–6] Staff.

397. Special Studies in Spanish Literature. FALL, SPRING. [Variable credit: 1–6] Staff.

398. Special Studies in Spanish American Literature. FALL, SPRING. [Variable credit: 1–6] Staff.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Portuguese

200. Intermediate Portuguese. Intermediate or intensive language course. Follow-up of Portuguese 102 or intensive course for students with some previous preparation. Composition, conversation, grammar review. Cultural components, including films, art, music, and literature from the Luso-Brazilian world. SPRING. [3] Oliveira.

205. Introduction to Luso-Brazilian Literature. Critical readings and methods of literary analysis. Selections include masterpieces from Portugal and Brazil and cover all genres in several periods. Emphasis on improving conversational and writing skills. Prerequisite: 200. FALL. [3] Oliveira, Fitz.

225. Brazilian Culture. The values and attitudes that shape Brazil and Brazilian national identity. History, race relations, literature, music, cinema, and ecology. Taught in English. FALL. [3] Oliveira.

232. Introduction to Brazilian Literature. 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. FALL. [3] Fitz.

285. Modern Brazilian Literature. The development of Brazilian literature from the *Semana de Arte Moderna* to the present. Emphasis on the Modernist and Neo-Modernist movements. SPRING. [3] Fitz.

289. Independent Study. Content varies according to the needs of the individual student. Primarily to cover material not otherwise available to the student in the regular curriculum. FALL, SPRING. [Variable credit: 1–3 hours, not to exceed 12 over a four-semester period]

293. Contemporary Latin American Prose Fiction in English Translation. (Also listed as Spanish 293) Major themes and techniques. No credit for graduate students in Spanish or Portuguese. [3] Fitz or Jrade. (Not currently offered)

294. Special Topics in Portuguese Language, Literature, or Civilization. Topics announced in the *Schedule of Courses.* [3] Fitz, Oliveira.

297. Latin American Literature in a Comparative Perspective: From the Pre-Columbian Era through the Nineteenth Century. Spanish American and Brazilian literature from the conquests to the end of the nineteenth century. Authors may include: Sor Juana, Mathos, Alencar, Assis, and Carrasquilla. Prerequisite: 205. [3] Fitz. (Offered 2007/2008)

298. Latin American Literature in a Comparative Perspective: The Twentieth Century up to the Present. Spanish American and Brazilian literature from twentieth century and to the present. Texts may include: *Os sertões, La guerra del fin del mundo, Ficciones, Perto do coração selvagem,* and *Água viva.* Prerequisite: 205. [3] Fitz. (Offered 2007/2008)

301. Literary Analysis and Theory. (Also listed as Comparative Literature 313 and Spanish 301) Methods of literary analysis for the teaching of literature. The systematic application of contemporary theories—structuralist and poststructuralist—in the analysis of poetry and narrative. FALL. [3] Zamora or Friedman.

302. Ibero-Romance Philology. (Also listed as Spanish 302) Study of the evolution of the languages and dialects of the Iberian Peninsula. Analysis of selected linguistic developments and readings from medieval texts. SPRING. [3] Rasico.

310. Foreign Language Learning and Teaching. (Also listed as Spanish 310) Principles and practices of teaching a second language, with concentration on recent interactive and communicative models of foreign language instruction. Goals of the course are 1) to introduce principles of Second Language Acquisition and learning, 2) to critically read relevant literature in the area(s), and 3) to develop FL instructor's awareness through reflective and critical thinking. Classroom observations, journal writing, development of materials, and a small action-research project are expected. Required of all entering teaching assistants. FALL. [3] Alpren.

314. Introduction to Latin American Colonial Studies. (Also listed as Spanish 314) Provides a panoramic introduction to the canonical works of the colonial period from "discovery" to "independence," as well as an overview of the theoretical debates in colonial studies within the Latin American context. Topics include the construction and reshaping of *identities* and *otherness* through various stages of Latin American cultural history, the emergence of what has been called the American consciousness during the "New World Baroque," and the discourses of "independence" and early nation building. [3] Jáuregui, Fitz. (Not currently offered)

338. Seminar: Studies in Colonial Literature. (Also listed as Spanish 338) [3] Fitz, Jáuregui. (Not currently offered)

340. Seminar: Hispanic American Essay. (Also listed as Spanish 340) SPRING. [3] Jáuregui.

351. Comparative Methodology. (Also listed as Spanish 351) Comparative literature as an academic discipline: definition, scholarly and theoretical distinctions, methodologies, applications, relationship to comparative literature. FALL. [3] Fitz.

385. Seminar: Studies in Contemporary Literature of the Portuguese-Speaking World (Portugal, Brazil, Lusophone Africa). Variable topics to be announced in the *Schedule of Courses*. May be repeated with change of topic. SPRING. [3] Fitz.

397. Special Studies in Portuguese Literature. FALL, SPRING. [Variable credit: 1–6] Staff.

398. Special Studies in Brazilian Literature. SPRING. [Variable credit: 1–6] Staff.

399. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Special Education

CHAIR Daniel Reschly
DIRECTOR OF GRADUATE STUDIES Mark Wolery
PROFESSORS Anne L. Corn, Stephen N. Elliott, Donna Y. Ford, Douglas Fuchs, Lynn S. Fuchs, Stephen E. Graham, Karen R. Harris, Robert Hodapp, Carolyn Hughes, Ann P. Kaiser, Craig Kennedy, Daniel Reschly, Mark Wolery, Paul J. Yoder
RESEARCH PROFESSOR Teris Schery
ASSOCIATE PROFESSORS Donald L. Compton, Joseph J. Cunningham, Mary Louise Hemmeter, Joseph H. Wehby
ASSOCIATE PROFESSOR OF THE PRACTICE Kimberly Paulsen
ASSISTANT PROFESSOR Kathleen Lynne Lane
ASSISTANT PROFESSOR OF THE PRACTICE Ruth Ashworth Wolery
ASSISTANT CLINICAL PROFESSOR OF SPECIAL EDUCATION To Be Announced

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

☙ THE program of study is based in the multidisciplinary body of knowledge relevant to the understanding, education, and treatment of persons with disabilities. The Ph.D. degree is composed of three major elements of course work: core studies in special education, including 10 hours of proseminar in special education; at least 13 formal course hours in research methods; and a 15-hour minor or related area of study. The program of study will be planned individually with the major professor and approved by the student's qualifying committee. In addition, the program requires demonstration of competence in research methods and dissemination and in college teaching/supervision.

3000. Education and Psychology of Exceptional Learners. An overview of people who are labeled "exceptional" and the implications for education related to them. The disabilities that people have and services, systems, and concepts associated with them. Legal, sociological, educational, political, general system theory perspectives and psychological perspectives. State and federal law relating to education from infancy to adulthood will be related to intervention, ethics, and issues. Trends and issues related to the areas of exceptionality and relate these to previous trends, issues, and attitudes. FALL. [3] Staff.

3010. Proseminar I. Advanced review of research and scientific principles, methods, and the status of research and other professional developments in special education. Required for post–master's degree students in special education. FALL. [3] Kaiser.

3011. Proseminar II: Contrasting Research Methodologies in Special Education Research. An overview of the frameworks and major designs within three alternative research methodologies within Special Education: single-subject research, group design, and qualitative methods. Prerequisite: 301a. SPRING. [3] L. Fuchs.

3012. Research Design in Special Education. In-depth analysis of group research methodology within Special Education. Design features and statistical methods are reviewed; research is critiqued; and sample studies are designed. Prerequisite: 301a, 301b. FALL. [3] L. Fuchs.

3013. Introduction to Single-Subject Research Methodology. Initial course in the use of single subject research methodology within Special Education. Overview of behavioral measurement, single subject research designs, and methods of data analysis. Critical analysis of research articles. Development of a single subject research proposal is required. Prerequisite: 321. SPRING. [3] Kennedy.

3014. Advanced Procedures in Single-Subject Research Methodology. Use of research procedures to investigate problems in the education of persons with disabilities. Advanced procedures in single subject research methodology, including design strategies and experimental control, are emphasized. Design and implementation of a research study is required. Prerequisite: 301d, 321. FALL. [3] Hughes.

3015. Implementing Research in Special Education. Provides structure and support for students implementing studies in Special Education. Design and implementation issues in research are reviewed with peers and faculty participants to help students resolve problems and design better studies. Prerequisite: 301a, 301b, 301c, 301d. SPRING. [1] Staff.

3016. Teacher Education Research. Designed for doctoral students interested in preservice teacher education research. It focuses on two of the most important domains in the teacher education field, namely teacher learning and multicultural teacher education research. SPRING. [3] Artiles.

3017. Experimental Analysis of Behavior . Overview of basic behavioral processes. Presents information relating to human and nonhuman learning with a focus on the experimental analysis of behavior. Topics covered include environmental feedback mechanisms, schedules of reinforcement, establishing operations, multioperant performances, discriminative stimulus control, stimulus equivalence, rule-governed behavior, behavioral pharmacology, and remembering/forgetting. The course also focuses on research methodologies and the critical analysis of research. Students apply their skills using computer-based simulations of laboratory experiments. [3]

3018. Observational Methods. This doctoral-level course addresses what is known about quantitative, systematic observation of behavior to measure behavior that may or may not be used to infer status on psychological constructs. The content emphasis is on providing students with the rationale for selecting among the many options at all stages of observational measurement. Among the topics covered are (a) classical measurement theory and Generalizability theory as they relate to observational measurement, (b) principles for selecting measurement procedures, selecting behavior sampling methods, designing coding systems, selecting appropriate metrics (including nonsequential and sequential variables), (c) sequential analysis of behavior , (d) the tension between ecological validity , representativeness, and construct validity, (e) interobserver reliability issues, and (f) other issues related to the direct observation of behavior. [3]

3030. Advanced Issues in Family Intervention. Issues and practices related to families with children who have special needs. Emphasis on taking a family systems prospective and a family centered approach to intervention. Provides strategies for effective communication for the purpose of information sharing and collaborative planning with families. Topics include definition and history of the family, family and professional relationships, professional ethics, models of working with families, service coordination, family assessment and the IFSP , promoting family participation in the IEP, and Public Laws, including I.D.E.A. FALL. [3] Staff.

3040. Administration and Supervision in Special Education. Principles, theories, and methods of administration that emphasize managerial functions. Prepares students to assume leadership roles in special education and organizations providing services for people with disabling conditions. Prerequisite: 300 or consent of instructor. [3] (Not currently offered)

3050. Augmentative and Alternative Communication. This course is designed to provide an overview of the field of augmentative and alternative communication (ACC) for use with young children and school-age children with severe disabilities. Specifically, the course will provide an overview of theories that are important to the understanding of appropriate uses of ACC 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 ACC systems. [3]

3060. Cultural Diversity in American Education. 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. FALL. [3] Artiles.

3070. Special Education Law. Survey of current law relating to special education of infants, toddlers, children, and youth and adults. Emphasis is on major federal statutes and regulations, particularly the Individuals with Disabilities Education Act and its regulations. Related laws include "Section 504," grants and contracts law, related state laws, leading cases (e.g., AIDS, extended school year, LRE, testing, private residential placement), IEPs, and Family Service Plans. Proper APA citation and writing about laws and cases. [3] (Not currently offered)

3080. High Poverty Youth: Improving Outcomes. 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 twice 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]

3120. Field Work in Special Education Teaching. Observation, participation, and classroom teaching for graduate and professional students majoring or minoring in any of the areas of exceptionality. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING. [1–6] Staff.

3130. Advanced Field Work in Special Education. Practicum for graduate and professional students majoring or minoring in any area of exceptionality, with opportunity for supervised participation in community special education programs. May be repeated for credit. Prerequisite: consent of instructor. FALL, SPRING. [1–6] Staff.

3140. Extended Student Teaching for Graduate Students. Graduate student teaching, observation, participation, and full-day classroom teaching. Designed for graduate students with no previous undergraduate student teaching experience. Prerequisite: 312 and consent of department. FALL, SPRING. [6] Staff.

3210. Management Procedures for Academic and Social Behavior. Application of behavioral principles in educational settings. Definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress. Procedures for increasing academic and socially appropriate behavior through simulations and practice exercises. Review of research methodologies and the critical analysis of research literature in the area of applied behavior analysis are required. Students apply their skills in classroom settings. Corequisite: 1 hour of 312 or 313. FALL. [3] Wehby.

3230. Research Methods in Special Education. Students will learn the purposes, procedures, and processes of conducting research on educational and psychological issues of exceptional children and educational programs. Includes the study of terminology and

research methods (both quantitative and qualitative) and "hands-on" application of methods in small-scale pilot studies within the classroom. Some study of statistical procedures is included, but the practical methods and simple computer analyses are emphasized over formulas and mathematical calculations. [3] D. Fuchs.

3250. Proseminar in Mental Retardation. (Also listed as Psychology and Human Development 325P) Variable topics. May be repeated with change in topic. FALL, SPRING. [2] Staff.

3300. Advanced Programming for Students with Severe Disabilities. Provides information on the nature and needs of individuals with severe/profound disabilities and the roles of federal, state, and local agencies in providing services to this population. Emphasis on strategies for the acquisition and generalized use of age-appropriate functional skills in natural community-based settings. Methods for developing, implementing, and evaluating 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. Current research evidence to support effective practices is stressed. FALL. [3] Hughes.

3310. Transition for Persons with Disabilities. Theory and practice of transition from school to community and employment living for young adults with disabilities. Legislative history and practical applications of skills such as job development and job placement. Prerequisite: 3300. [3] Hughes.

3320. Advanced Transition for Persons with Disabilities. Extends and deepens the course content of 3310. Greater emphasis on development of programs and interagency collaboration and development of community-based transition. Prerequisite: 3300, 3310, or consent of instructor. [3] Hughes.

3330. Advanced Procedures for Students with Multiple Disabilities. The causes, treatment, education, and management of students with multiple disabling conditions, including neurological impairments resulting in physical disabilities, sensory impairments, and the combination of these. Emphasis on environmental adaptations and direct training needed to maximize independence as determined through systematic ecological inventories. Physical and medical management. Competencies in research-based programming. SPRING. [3] Staff.

3340. Instructional Principles and Procedures for Students with Severe Disabilities. Characteristics and models of effective instruction, particularly for students with severe disabilities. Behavioral, ecological, and developmental learning theories and implications for instruction. Methods for defining current level of functioning, designing interventions, and monitoring learner progress. Review of fundamental special education procedures including IEP development, task and concept analysis, effective teaching strategies, and functional curriculum programming. Current research evidence to support effective practices. [3] (Not currently offered)

3360. Advanced Procedures for Community and Employment Integration. Graduate-level course in advanced procedures in community and employment integration of persons with disabilities. Strategies that may be applied on four levels in order to facilitate integration: (a) individual, (b) school or workplace, (c) community, and (d) systems-wide. Students implement interventions in school, work, or community settings. SPRING. [3] Hughes.

3400. Foundations of Early Childhood Special Education. Provides the historical, legal, and theoretical foundations of early intervention/early childhood special education for infants, toddlers, and preschoolers with disabilities. Includes recommended practices related to assessment and instruction for early childhood classes. Discusses typical and atypical development, assessment to identify goals and outcomes, and strategies for promoting development. [3]

3410. Recommended Practices in Early Childhood Special Education. Provides information on typical and atypical development of infants, toddlers, and preschoolers with disabilities. Includes in-depth treatment of recommended practices in assessment, instruction, application of practices in natural and inclusive environments, and working with other professionals in service sites. [3]

3420. Recommended Practices in Early Elementary Grades for Children with Disabilities. Provides information on typical and atypical development of early elementary children with disabilities. Includes discussions of the general education curriculum (literacy, mathematics, social studies, and science) and recommended practices in adapting that curriculum for children with disabilities. [3]

3510. Educational Procedures for Visually Impaired Learners. Introduction to the literature, history, principles, programs, practices, and problems in the field. Administrative, curricular, and methodological adaptations for various educational programs. The education of individuals with visual impairments and other accompanying disabilities. SPRING. [3] Com.

3540. Communication Skills for Visually Impaired Learners. Emphasis on methods of teaching communication skills and the preparation of materials for the visually impaired. Open only to teachers who have a working knowledge of braille. Consent of instructor required. SPRING. [3] Staff.

3550. Orientation and Mobility Skills for Teachers of Visually Impaired. Lectures, discussions, and simulated activities in teaching orientation, mobility concepts, and skills to visually impaired individuals. Offered by a mobility specialist. FALL. [3] Staff.

3580. Advanced Procedures for Visually Impaired Learners. Topics related to assessment, social skills development, transitions, career development, consumerism, and other unique areas of the core curriculum for visually impaired learners. FALL. [3] Staff.

3590. Advanced Orientation and Mobility Skills for Teachers of Visually Impaired: Practicum. Advanced course equips orientation and mobility specialists with methods, techniques, and approaches using the long cane and other mobility devices essential in the development of safe and efficient travel skills of persons with visual impairments. Demonstration, simulation, and practicum experiences in various settings. Prerequisite: 255 or consent of instructor. FALL. [3] Staff.

3600. Speech and Language for Exceptional Learners. An overview of normal language development, psycholinguistic theory, and research. Emphasis on specific intervention procedures useful for teachers of children and youth with severe/profound or mild/moderate disabling conditions. SPRING. [3] Staff.

3690. Master's Thesis Research.

3700. Applications of Technology in the Classroom. The use of computer-based instruction and management systems to facilitate classroom instruction. Review of the history of the development of computers; the use of technology with persons with disabilities; review and analysis of microcomputer and video technology hardware and software; overview of instructional and managerial computer applications. No previous computer experience required. SPRING. [3] Staff.

3710. Advanced Applications of Technology in the Classroom. Models and techniques of instruction for integrating computers and technology into special education classroom curricula. The development, implementation, and advanced instructional and managerial applications of technology when used with disabled individuals. Prerequisite: 370 or equivalent. [3] (Not currently offered)

3720. Seminar: Microcomputer Technology in Special Education. An in-depth look at the use of existing microcomputer technology as it relates to research on teaching and learning in special education. Seminar participants review extant research on the use of microcomputer technology with special-needs populations and propose new applications of existing and developing technology. Each class member is required to participate in developing a section of a publishable manuscript on the topic "what we know about the effectiveness of special education technology," and will be expected to demonstrate basic competencies in the use of the microcomputer for research and professional dissemination activities. [3] (Not currently offered)

3800. Advanced Trends and Issues in Learning Disabilities. Advanced study of current trends, research, and issues in mild/moderate disabilities with specific emphasis on learning disabilities. Historical perspectives and theoretical models; empirical research related to definitions, identification procedures, conceptualizations, educational strategies, and service delivery options for individuals with learning disabilities. FALL. [3] D. Fuchs.

3810. Advanced Trends and Issues for Students with Behavior Disorders. Historical overview and analysis of theoretical issues regarding etiology and treatment of severe behavior disorders. Definitions, historical development, contributing factors, and major classifications of behavior disorders. Research methods used in treating disordered behavior. Ability to analyze, synthesize, and apply research methods related to prevention and management strategies with children and adolescents is required. FALL. [3] Staff.

3820. Advanced Issues and Procedures in the Assessment of Students with Mild/Moderate Disabilities. The diagnosis and evaluation of students with mild/moderate disabilities using a variety of developmentally appropriate curriculum-based assessments, criterion-referenced, and norm-referenced tests in the academic and vocational subject areas. Emphasis on the interpretation of information from assessments into Individualized Education Program annual goals and objectives and instructional programming strategies. Specific consideration is given to reporting assessment information to parents, teachers, and other support personnel to determine appropriate placement levels within the continuum of services. Practical application is required. FALL. [3] Staff.

3825. Educational Testing, Assessment, and Accountability. In-depth analysis of testing, assessment, and accountability applied to general and special education. Analysis of applied issues such as standards-based reform, annual yearly progress, response to intervention, and program effectiveness. FALL. [3]

3830. Advanced Instructional Procedures for Students with Mild/Moderate Disabilities. This methodological course consists of two principal components. The first applies instructional design, delivery, and assessment procedures taught in 383 to mathematics content. Intensive instruction in the theory of direct, explicit mathematics instruction. The second component reviews technological advances and validated learning, test-taking, study, and self-monitoring strategies for students with mild/moderate disabilities. SPRING. [3] Paulsen.

3840. Instructional Principles and Procedures in Reading and Writing for Students with Disabilities. Presents empirically validated instructional procedures to address the reading and writing deficits of students with disabilities. Focuses on explicit teaching procedures, direct instruction, and instructional design principles that apply to reading and writing. Proficiency in the development of assessment profiles, instructional lessons, monitoring of progress through curriculum-based measures and data-based decision making is required. [3]

3845. Advanced Principles and Procedures in Reading and Writing for Students with Disabilities. This course focuses on the etiology and treatment of developmental reading and writing problems in children. Methods for designing effective instruction/interventions,

principles that apply for defining current level of functioning, and monitoring learner progress are emphasized. SPRING. [3]

3850. Consultation Strategies for Teachers of Students with Mild/Moderate Disabilities. The history, theory, and research associated with models of school consultation with an emphasis on behavioral consultation. The use of behavioral consultation to help teachers better accommodate individuals with social and academic problems in their classrooms. Interdisciplinary consultation strategies involving parents, medical, vocational, career, and social work professionals. Prerequisite: 3800 or 3860. [3] (Not currently offered)

3860. Advanced Procedures in Classroom Management and Social Skills Instruction for Students with Mild/Moderate Disabilities. Current teaching practices in the field, with emphasis on examination of the research bases of effective teaching with students with behavior problems. Procedures for serving learners with behavior problems who are served by consultant, resource, and self-contained teachers. Students are expected to synthesize and analyze research on effective teaching and management practices and to apply the knowledge to classroom situations for students with behavior problems. SPRING. [3] Staff.

3870. Accommodating Diversity in the Classroom. 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. SPRING. [3] D. Fuchs.

3880. Teaching Special Education in Secondary Schools. This course consists of two components. The first component focuses on an overview of special education in secondary schools. Emphasis will be placed on specific secondary models, characteristics of high school students with disabilities, and dropout prevention. The second component focuses on empirically-based test-taking, study, self-monitoring, and self-advocacy strategies. Accommodations for students with disabilities within content areas are also emphasized. FALL. [2] Hughes.

3930. Seminar in Special Education. Special topic areas directly related to students' objectives. FALL, SPRING. [Variable credit: 1–4] Staff.

3931. Seminar: Behavioral Research in Education of the Visually Impaired. Analysis and synthesis of research, theory, and the literature in education and related psychological and social factors for blind and visually impaired persons. FALL, SPRING. [1–3] Corn.

3937. Seminar: Issues and Trends in Early Childhood Special Education. Topical seminar in research issues relevant to early childhood special education. SPRING. [Variable credit: 1–3] Kaiser.

3950. Internship in Special Education. Supervised on-site experience in a professional role as teacher, counselor, research associate, administrative aide, or other member of professional teams. Consent of major professor required. SPRING. [Variable credit: 1–12] Staff.

3960. Readings and Research in Special Education. Individual programs. May be repeated. Consent of instructor required. FALL, SPRING. [Variable credit: 1–3] Staff.

3990. Ph.D. Dissertation Research.

3995. Half-time Ph.D. Dissertation Research. For students who have completed 72 hours and devote a half-time effort to dissertation research. [0]

Teaching and Learning

CHAIR Leona Schauble
DIRECTOR OF GRADUATE STUDIES Clifford A. Hofwolt
PROFESSORS EMERITI Jerold P. Bauch, Carolyn M. Evertson, Elizabeth Spencer Goldman, Charles B. Myers
PROFESSORS Paul A. Cobb, Dale C. Farran, Rogers Hall, Richard Lehrer, Victoria J. Risko, Leona Schauble
PROFESSOR OF THE PRACTICE EMERITA Earline D. Kendall
ASSOCIATE PROFESSORS Clifford A. Hofwolt, Kevin M. Leander, Kay J. McClain, Deborah W. Rowe
ASSOCIATE PROFESSOR OF THE PRACTICE Ann M. Neely
ASSISTANT PROFESSORS Kefyn Catley, Youb Kim, Henry Richard Milner, Carin Neitzel
RESEARCH ASSISTANT PROFESSOR Alene H. Harris

DEGREES OFFERED: *Master of Science, Doctor of Philosophy*

THE graduate program in teaching, learning, and diversity is designed for persons who will conduct research on teaching and learning processes and who will pursue careers as education faculty members at research universities. The program admits a very select number of students with strong academic credentials who have had experience in K–12 education and are interested in working closely with the faculty in research and development projects.

Programs of study for the doctor of philosophy include (a) a core set of courses that develops a knowledge base in the areas of learning theory and classroom processes; (b) a specialization area, developed in conjunction with a faculty adviser, which focuses on an area of research such as classroom processes, young children's learning, or applications of technology to instruction; (c) a minor area, either within the department or in a related area; and (d) research methodology courses including statistics and research design.

Students admitted to the doctor of philosophy program in teaching, learning, and diversity may obtain a master of science degree with a major in teaching, learning, and diversity upon completion of 30 semester hours and the completion of either a thesis or the major area paper.

Post-baccalaureate professional degree programs (M.Ed.) are offered through Peabody College. Information regarding these programs is available in the Peabody College catalog.

Education

2040. Introduction to Classroom Technologies. An introduction to various technologies used in classrooms with an emphasis on microcomputer-based technologies. Meets licensure requirements for preservice teachers. Credit for M.A.T. students only. FALL, SPRING. [1] Staff.

2310. Teaching in Secondary School. Curriculum organization and patterns, teaching methods, and professionalism of the secondary-school teacher. A practicum in secondary schools included. Credit for students seeking teacher licensure only. FALL, SPRING. [3] Staff.

2320. Teaching for Understanding and Academic Literacy. Designed to assist secondary content teachers in developing multiple teaching strategies, including use of technology, to enhance students' learning opportunities in diverse classrooms. Includes an emphasis on all teachers as teachers of reading and writing. Pre- or corequisite: EDUC 2040. [2] Staff.

3000. Internship in Teaching: Elementary. Observation, participation, and teaching in graduate intern centers and/or schools. Post-baccalaureate equivalent of student teaching. May be repeated to provide experiences at different levels. FALL, SPRING. [6] Staff.

3001. Internship in Teaching: Early Childhood Education. Observation, participation, and teaching in graduate intern centers and/or schools. Post-baccalaureate equivalent of student teaching. May be repeated to provide experiences at different levels. FALL, SPRING. [6] Staff.

3002. Internship in Teaching: Secondary. Observation, participation, and teaching in graduate intern centers and/or schools. Post-baccalaureate equivalent of student teaching. May be repeated to provide experiences at different levels. FALL, SPRING. [6] Staff.

3005. Internship Seminar: Elementary. Seminar to accompany EDUC 3000. FALL, SPRING. [1] Staff.

3006. Internship Seminar: Early Childhood Education. Seminar to accompany EDUC 3001. FALL, SPRING. [1] Staff.

3007. Internship Seminar: Secondary. Seminar to accompany EDUC 3002. FALL, SPRING. [1] Staff.

3030. Sociology of the Classroom. Sociological and social psychological aspects of classroom settings, group processes, and influences on teaching and student learning. FALL. [3] (Not currently offered)

3040. Teaching as a Social Practice. This course provides an investigation into teaching as situated in the social context of the school and school district. Classroom observations in tandem with a series of readings are the basis of the course. Assignments are intended to provide students opportunities to coordinate important aspects of the readings with observation of practice. [3] McClain.

3050. Advanced Social and Philosophical Aspects of Education. Exploration of the interaction between contemporary social problems and various philosophies in relation to educational theory, policy, and practice. FALL, SPRING, SUMMER. [3] Smrekar.

3070. Inquiry into Education. An introduction to the function and means of various practices of educational research. Promotes understanding of the language of educational inquiry, aims and uses of research, various ways of framing research questions and designing studies, and procedures for obtaining, analyzing, and interpreting qualitative and quantitative data. Presents issues of procedure or design and related issues of validity; construct definition and data generation, instrumentation and data collection; and data quality, meaning, appropriateness, credibility, and inferences made based on data. [3] Neitzel.

3110. Psychological Foundations of Education. (Also listed as Psychology and Human Development 334P) Psychological theories and research as related to the design and practice of education. Specific consideration of the developmental bases of teaching, learning, and student performance (early childhood through adult); individual differences in education with particular reference to socioeconomic status, disabling conditions, learning style, and gender; evaluation of learning; classroom and organizational influences on school effectiveness; family-school relations. FALL, SPRING. [3] Staff.

3120. Learning and Instruction. Introduces theories of learning and explores their utility for the design of learning environments. Contrasts sociocultural and cognitive approaches toward concepts and categories, problem solving, and model-based reasoning. FALL. [3] Lehrer.

3140. Seminar in Teaching and Learning. Theory and current practice in various content areas and at all levels of instruction, preschool through college. For graduate and professional students in Teaching and Learning. SUMMER. [3] Staff.

3150. Advanced Science and Social Studies Curriculum in Early Childhood Education. An integrated study of the development of young children's scientific and historical ideas, early childhood science and social studies curriculum, and strategies for effective science and social studies instruction. The course will draw from and build upon current research and exemplary practice. [4]

3170. Analysis of Teaching. Use of objective and unobtrusive evaluation procedures and methodologies in a variety of educational settings. Emphasis on theoretical base for qualitative and quantitative evaluation and methodologies. Experience given in collecting, processing, summarizing, and reporting data. SPRING. [3] McClain.

3180. Observation and Curriculum Planning. Survey of a variety of observation and assessment techniques used to inform curriculum planning for young children. The focus of the course is on using formative assessment to plan instruction based on students' developing understandings. Also considers 1) use of formative assessment, 2) relations between formative and summative assessment, 3) working with other professionals to plan and conduct assessments, and 4) ways to collaborate and communicate with families. [3]

3200. Foundations in Learning and Development. Provides a foundation in relevant developmental milestones related to children's academic behaviors from pre-kindergarten through high school. Children's development and learning are viewed in the context of school expectations with an emphasis on the diversity among learners. [3]

3210. Instructional Programs for Young Children. Compares models of current interest in curriculum, materials, methods, and staff roles. Observation in a variety of local early childhood education programs. SPRING. [3] Staff.

3220. Parents, the School, and the Community . Parent participation, parent education, and community involvement in school programs. Laboratory experiences in school settings examine ecological influences and environmental transactions among the home, school, and community. SPRING. [3] Staff.

3230. Administration and Supervision of Early Childhood Programs. Selection, training, and supervision of staff; working with regulatory agencies, boards, funding sources, and parents; evaluation of program components; and exploration of administrative theory and practice. [3] Staff. (Not currently offered)

3240. Seminar in Early Childhood Education. Relevant research as the basis for formulating policies and program development guidelines. Different topics emphasized each time course is offered. May be repeated for credit with change of topic. [3] (Not currently offered)

3250. Advanced Seminar in Early Childhood Education. Emphasizes research, theory, and policy making that bear on current practice. Intended primarily for post–master's degree students. FALL. [3] Staff.

3370. Literacy Assessment and Professional Development. Study of literacy assessment research and practices, multiple opportunities for collecting and analyzing data using multiple assessment tools, and methods for implementing diagnostic findings in PreK–12 settings, emphasizing corrective instruction. Attention is given to professional development of teachers

and paraprofessionals in areas of literacy development and methods for communicating the use of assessment information to guide instructional decisions. [3] Risko.

3380. Seminar in Language and Literacy Education. Emphasis on current literacy research and topical issues. Designed to meet the needs of pr ofessional students with a major in language and literacy education. Prerequisite: EDUC 3390 or 3420. [1–3] (Not currently offered)

3390. Literacy Development. Survey of theories and approaches to developing reading and writing in school-based settings. In-depth development of theory and research related to literacy development, with an emphasis on reading/writing processes and instruction. [3] Rowe.

3412. Literacy Learning in Early Childhood: Theory and Resear ch. This course explores literacy learning in the early years between bir th and age 8. Seminal and cutting-edge research will be analyzed through multiple theoretical lenses with emphasis on sociocultural, sociosemiotic, and sociocognitive perspectives. [3] Staff.

3413. Creating Literacy Environments for Young Children. This course will explore theory and research on supportive literacy learning environments in preschool and early elementary classrooms. Students will lear n to use observations of childr en and families as a basis for planning holistic literacy experiences that are child-centered and culturally sensitive. [3] Staff.

3420. Literacy for Diverse and Special Needs Lear ners. Emphasis on theories, r esearch, philosophies, principles, and pr ocedures associated with appr oaches to literacy instruction for students experiencing pr oblems with literacy development. Analysis of multiple factors and handicapping conditions contributing to literacy dif ficulties and how these af fect diagnostic and instructional outcomes. Focus on methodologies for accommodating literacy pob-lems in r egular classrooms and special settings, and communicating with pr ofessionals, parents, and paraprofessionals. [3] Risko.

3440. Issues and Trends in Literacy Instruction. Issues and trends in literacy, including reading in a pluralistic society , early r eading, adult r eading, intervention strategies, and appraisal and measurement. FALL. [3] Risko.

3450. Psycholinguistic Aspects of Language and Literacy . Designed to provide a theoretical base for evaluating recent developments in the field of language and literacy from a psycholinguistic perspective. SPRING. [3] Staff.

3460. Teaching and Lear ning the Language Arts: Theory and Resear ch. Provides in-depth study of theor y and research on teaching and lear ning the language ar ts (reading, writing, speaking, and listening) and r elated literacies (e.g., ar t, drama). Special emphasis is given to writing development and the teaching of writing in the pr eschool and elementary years. FALL. [3] Rowe.

3470. Social Aspects of Language and Literacy . Introduces social and cultural theories of language and literacy learning and teaching, and the research questions and methods associated with them. Includes study of sociocultural, sociolinguistic, semiotic, anthr opological, and critical theory approaches to the study of literacy learning and use. [3] (Not currently offered)

3500. Foundations of Education. Introduction to schools, classr ooms, teaching, and the nature of students and learning. Intended for master's degree students who are in the early stages of pr eparing for licensur e as early childhood, elementar y, or secondar y school teachers. SUMMER, FALL. [3] Harris, Hofwolt.

3510. Advanced Teaching in Secondary Schools. Exploration of teacher decision making regarding classroom climate, curriculum, and classr oom management in secondar y schools. A practicum in secondary schools is included. SPRING, SUMMER. [3] Staff.

3610. Curriculum Foundations. Critical analysis of historical and contemporar y curricula research, theory, and practice in public schools and other learning contexts. FALL. [3]

3620. Principles of Curriculum Development. Examines curricula theory and practice on multiple levels in designing r esponsive curricula. Emphasis on understanding complex processes in curriculum development. SPRING. [3]

3690. Master's Thesis Research.

3800. Classroom Technologies: Theory and Applications Development. Examines some of the theoretical principles on which classroom technologies are based. The roles of these technologies in classroom settings are examined and students gain exper tise in developing and implementing these technologies. Prerequisite: Basic computer literacy. FALL. [3] Staff.

3850. Seminar on Instructional Technology. Examines advanced uses of technology for instruction. Computer-based systems as well as video and hyper media will be topics for discussion and project development. Previous microcomputer experience required. Prerequisite: 2050 or consent of instructor. [3] Staff.

3890. Individual Study in Education. Semi-independent study on selected topics in education. May be r epeated. Prerequisite: consent of instructor . FALL, SPRING. [Variable credit: 1–3] Staff.

3900. Special Topics in Education. Special issues or topics related to education. May be repeated. FALL. [Variable credit: 1–3] Staff.

3911. Methods of Educational Resear ch: Quantitative. Survey of modes of conceptualization, problem identification, and research design. Development of skills, principles, and techniques of quantitative research, and the analysis, interpretation, and effective presentation of results. Lectures and group discussions and critiques in seminar format. [3] (Not currently offered)

3912. Methods of Educational Resear ch: Qualitative. Covers issues and strategies involved in collection and analysis of qualitative data. Focuses on the assumptions and related research techniques of qualitative research, framed by the post-positivist paradigm (i.e., naturalistic inquiry, ethnography). SPRING. [3] Rowe.

3921. Ethnographic and Qualitative Resear ch in Education. This course pr ovides indepth knowledge of and skill with ethnographic and qualitative r esearch theory and methods as applied to educational issues. This is the first of a two-course sequence. [3] (Not currently offered)

3922. Ethnographic and Qualitative Resear ch in Education. This course pr ovides indepth knowledge of and skill with ethnographic and qualitative r esearch theory and methods as applied to educational issues. This is the second of a two-course sequence. [3](Not currently offered)

3930. Research in Education. Individual programs of research in various education fields. Prerequisite: consent of faculty supervisor . May be r epeated. FALL, SPRING. [Variable credit: 1–6] Staff.

3990. Ph.D. Dissertation Research.

English Education

2370. Teaching English in Secondary Schools. Required for secondary school licensure in English. Credit for students seeking teacher licensure only. FALL. [3] Staff.

2400. Seminar in English Education. Explores methods of teaching the English language arts in secondary schools with an emphasis on student assessment, reflective practice, and teaching the English language arts to diverse classroom population. [3] Leander.

2450. Reading in Secondary Schools. Diagnostic instruments, reading skills, materials, and methods of teaching reading and study skills in content areas. SPRING. [4] Staff.

2920. Literature for Adolescents. Literary works appropriate to readers of middle-school and high-school age. Materials for readers of varying abilities. FALL. [3] Staff.

3000. Teaching Literature in the Preschool and Elementary Classrooms. Introduces students to the study of the field of children's literature and the principles of teaching literature in school settings. [3] Neely.

3007. Internship Seminar: Secondary. Seminar to accompany EDUC 3002. [1] Staff.

3020. Teaching Composition in the Secondary School and College. The objectives, organization, content, methods, and special problems of teaching composition. SUMMER. [3] Staff.

3030. Teaching Literature in the Secondary School and College. The objectives, organization, content, methods, and special problems of teaching literature. FALL. [3] Staff.

3040. Perspectives on the English Language. Introduction to English linguistics and to public and school issues related to the subject. For teachers and prospective teachers of English/language arts. SPRING. [3] Staff.

3220. Theory and Research in Composition Education. Composition theory and research as applied to education; examination of writing theory and practice at all levels. [3] (Not currently offered)

3230. Theory and Research in Literature Education. Literature theory and research as applied to education; examination of teaching and learning of literature at all levels. [3] (Not currently offered)

3370. English Education Theories and Practices. Explores theories and methods for teaching the English language arts in secondary schools with an emphasis on the teaching of composition. Corequisite: EDUC 236. [3] Leander.

3400. Teaching Reading in the Content Areas. Study of approaches to improving reading instruction in middle and secondary schools. SPRING. [3] Staff.

3500. Advanced Study of Literature for Children. Explores a variety of current topics relevant to the study of children's literature for students who already have had a solid introduction to the field. [3] Neely.

3530. Foundations for ELL Education. This course 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. [3]

3540. Methods and Materials for ELL Education. 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, English education) are covered. Frameworks for evaluating curriculum materials and their instructional recommendations for ELL students are provided. [3]

3550. Multicultural Education in Today's Classrooms. This course reviews many of the social and cultural factors that affect the learning and teaching of culturally and linguistically diverse students, including Limited-English-Proficient students. The course introduces students to the fields of educational anthropology and multicultural education and to the application of cultural information to curriculum development and classroom practice. The research

base for modifying and adapting instructional appr oaches to the needs of ELL students is a featured aspect of this course. [3]

3560. Acquisition and Assessment of ELL Students. This course focuses on understanding the pr ocesses of second language acquisition/lear ning/development and individual, cognitive, and social factors that influence second language lear ning in Nor th America (particularly in the United States). In addition, theoretical and practical aspects of language testing for second-language lear ners are covered. Instruments used by educators to assess the language pr oficiency and academic achievement of linguistically diverse students are presented and demonstrated. The course examines the purposes and types of language tests in r elation to theories of language use and language teaching goals; discusses testing practices and pr ocedures related to language teaching and language research; and includes the planning, writing, and administration of tests, basic descriptive statistics, and test analysis. Rubrics for r elating assessment information to instruction and program planning are developed within this course. [3]

3570. Practicum for ELL Education. The purpose of this course is to help students develop necessary dispositions, knowledge, and skills for teaching English language learners through situated learning experiences. Students will par ticipate in a field-based practicum working with students who are English language lear ners. Their experience will include use of either students' native languages and/or ESL instructional components. Identification of factors that facilitate and/or impede ELL student learning within specific contexts is a required outcome of the practicum. Students involved in the practicum will meet with a university faculty member on a bi-weekly basis to assess their progress in the field. [3]

3690. Master's Thesis Research.

3890. Individual Study in English Education. Semi-independent study of selected topics in English education. Pr erequisite: consent of supervising instructor . May be r epeated. FALL, SPRING. [Variable credit: 1–3] Staff.

3900. Special Topics in English Education. May be repeated with change of topics. [Variable credit: 1–3] (Not currently offered)

3930. Research in English Education. Individual program of research in English education. Prerequisite: consent of supervising instructor. May be repeated. FALL, SPRING. [Variable credit: 1–6] Staff.

3960. Internship in English Education. Supervised on-site experience in a pr ofessional role, as teachers, research associates, aides, or other members of professional teams. Prerequisite: consent of major professor. FALL, SPRING. [Variable credit: 1–12]

3990. Ph.D. Dissertation Research.

Foreign Language Education

2370. Teaching Foreign Language in Secondary Schools. Fundamentals of language learning and techniques of teaching. Requir ed for secondar y-school licensure in foreign languages. Credit for students seeking teacher licensure only. FALL. [3] Staff.

3007. Internship Seminar: Secondary. Seminar to accompany EDUC 3002. [1] Staff.

Mathematics Education

3007. Internship Seminar: Secondary. Seminar to accompany EDUC 3002. [1] Staff.

3150. Advanced Teaching of Mathematics for Young Children. Young children's mathematical thinking and learning as well as ways to support that learning are investigated. Emphasis is given to how children develop increasingly sophisticated additive structures (including pre-number and early number concepts, place value, and strategies for single- and double-digit computation), measurement, geometry and spatial sense, patterns and algebra, and data analysis and statistics. FALL. [3] Cobb.

3250. Advanced Teaching of Mathematics in the Elementary School. Foundations of elementary school mathematics and pedagogy for teaching this content will be examined. Problem solving, mathematical modeling, the language of mathematics, instructional techniques, and ways in which children learn mathematics will be emphasized. FALL. [3] Cobb.

3370. Advanced Teaching of Mathematics in Secondary Schools. A study of teaching and learning mathematics in middle and secondary schools with particular emphasis on the theoretical and research bases for classroom practice. Examines pedagogies that increase student understanding with particular emphasis on such secondary school mathematics topics as: functions, the arithmetic to algebra transition, geometry, spatial thinking, problem-centered learning, proof, history of mathematics and its relationship to other fields. Intended only for master's degree students seeking initial licensure. FALL. [3] Staff.

3690. Master's Thesis Research.

3810. Cognitive Theories of Mathematical Learning. (Also listed as Psychology and Human Development 381P) Examines the research literature on mathematical learning at the elementary and secondary levels. Considers both the epistemological assumptions and implications of information-processing theories, situated cognition theories, activity theory, and constructivism. SPRING. [3] Cobb.

3840. Social and Cultural Aspects of Mathematics Education. Examines the research literature on the social and cultural aspects of mathematics learning and teaching at the elementary and secondary level. Considers the coordination of psychological and social perspectives in mathematics education and deals with the implications for the development of instructional activities. [3] Cobb.

3890. Individual Study in Mathematics Education. Semi-independent study on selected topics in mathematics education. May be repeated. Prerequisite: consent of supervising instructor. FALL, SPRING. [Variable credit: 1–3] Staff.

3900. Special Topics in Mathematics Education. Seminars, conferences, workshops, or field activities focused on current issues. May be repeated. [Variable credit: 1–3] (Not currently offered)

3910. Investigations in the Teaching of Elementary-School Mathematics. Current issues and research. Application to classroom instruction. SPRING. [3] Staff.

3920. Investigations in the Teaching of Secondary-School Mathematics. Research in literature of mathematics education at the secondary-school level. [3] (Not currently offered)

3930. Research in Mathematics Education. Individual program of research in mathematics education. Prerequisite: consent of supervising instructor. May be repeated. FALL, SPRING. [Variable credit: 1–6] Staff.

3990. Ph.D. Dissertation Research.

Science Education

3007. Internship Seminar: Secondary. Seminar to accompany EDUC 3002. [1] Staff.

3300. Investigations and Trends in Science Education. Science teaching and science curricula at the middle-school and senior high-school level. Philosophies, teaching strategies, materials, and research. FALL. [3] Hofwolt.

3370. Advanced Teaching of Science in Secondary Schools. Study of theory, research, issues, curriculum approaches, trends, and modern approaches of teaching science in secondary schools. Intended only for master's degree students seeking initial licensure. FALL. [3] Catley.

3400. Philosophy of Science and Teaching. Examines how the historical and epistemological foundations of the structure of knowledge can be applied to the design and evaluation of curriculum, instruction, and assessment models. Prerequisite: PHIL 244, a course in cognitive psychology, or permission of the instructor. [3] Staff. (Not currently offered)

3690. Master's Thesis Research.

3890. Individual Study in Science Education. Semi-independent study on selected topics in science education. May be repeated. Prerequisite: consent of supervising instructor. FALL, SPRING. [Variable credit: 1–3] Staff.

3900. Special Topics in Science Education. May be repeated. [Variable credit: 1–3] (Not currently offered)

3930. Research in Science Education. Individual program of research in science education. Prerequisite: consent of supervising instructor. May be repeated. FALL, SPRING. [Variable credit: 1–6] Staff.

3990. Ph.D. Dissertation Research.

Social Studies Education

3007. Internship Seminar: Secondary. Seminar to accompany EDUC 3002. [1] Staff.

3370. Advanced Teaching of Social Studies in Secondary Schools. A study of theory, research, and practice in secondary-level social studies. Students will examine multiple and conflicting purposes of social studies instruction and develop curricular models and pedagogical strategies for effective practice. Competencies that reflect effective social studies teaching practices will be developed. FALL. [3] Staff.

3890. Individual Study in Social Studies Education. Semi-independent study on selected topics in social studies education. May be repeated. Prerequisite: consent of supervising instructor. FALL, SPRING. [Variable credit: 1–3] Staff.

3900. Special Topics in Social Studies Education. May be repeated. [Variable credit: 1–3] (Not currently offered)

Women's and Gender Studies

DIRECTOR Monica J. Casper

☙ VANDERBILT University's program in Women's and Gender Studies offers an interdisciplinary graduate certificate program in gender studies. The certificate program provides graduate students across campus with access to interdisciplinary scholarship in the robust field of gender studies; supplies them with a valuable professional credential; and strengthens their ability to compete for jobs as well as national fellowships and postdoctoral awards.

Courses taken at Vanderbilt University prior to admission to the program may be counted toward the certificate requirements with the approval of the director. Any student enrolled in a graduate program at Vanderbilt University is eligible to apply for the certificate program in gender studies. Acceptance to the program requires a minimum GPA of 3.3, satisfactory performance of *B*+ or better in Women's and Gender Studies 301, and the approval of both the student's adviser and the director of the Women's and Gender Studies program.

Please contact the Women's and Gender Studies program for more information at *womens-studies@vanderbilt.edu* or phone (615) 343-7808.

Requirements for Graduate Certificate in Gender Studies

1. Women's and Gender Studies 301.
2. Women's and Gender Studies 302.
3. Three additional graduate-level courses on women, gender, and/or sexuality, appropriate to the student's program of study. Courses must be approved for credit and include at least one course outside the student's area. One course may be satisfied through an independent study with a faculty member affiliated with the Women's and Gender Studies program, with the approval of the director of Women's and Gender Studies.
4. A paper submitted to the Women's and Gender Studies steering committee for evaluation. The paper must demonstrate the application of a gender studies methodology to research, teaching, or fieldwork.

301. Gender and Sexuality: Feminist Approaches. Interdisciplinary introduction to the major debates, theoretical terms, and research methods in feminist, gender, sexuality, and queer studies. FALL. [3] Casper.

302. Gender and Pedagogy. Feminist theories of teaching and learning; gender and diversity in the classroom; critical pedagogy. SPRING. [1] Welch.

389. Independent Study. Work in a tutorial relationship with an individual faculty member or in a student seminar, subject to faculty approval, should several students share a common interest. FALL, SPRING. [Variable credit: 1–3 each semester] Staff.

Vanderbilt University Board of Trust

MARTHA R. INGRAM, Chairman of the Board, Nashville
DENNIS C. BOTTORFF, Vice Chairman, Nashville
DARRYL D. BERGER, Vice Chairman, New Orleans
WILLIAM W. BAIN, JR., Secretary, Boston
GORDON GEE, Chancellor of the University, Nashville

MARY BETH ADDERLEY
La Jolla, CA

MICHAEL L. AINSLIE
Palm Beach, FL

NELSON C. ANDREWS [E]
Nashville, TN

ANDREW B. BENEDICT, JR. [E]
Nashville, TN

CAMILLA DIETZ BERGERON
New York, NY

LEWIS M. BRANSCOMB [E]
La Jolla, CA

MONROE J. CARELL, JR.
Nashville, TN

SHERYLL D. CASHIN
Washington, DC

CARRIE A. COLVIN
West Hollywood, CA

THOMAS F. CONE
Nashville, TN

CECIL D. CONLEE
Atlanta, GA

MIRIAM MCGAW COWDEN [E]
Nashville, TN

BROWNLEE O. CURREY, JR. [E]
Nashville, TN

MARK F. DALTON
Greenwich, CT

WILLIAM W. FEATHERINGILL
Birmingham, AL

RON D. FORD
Los Angeles, CA

FRANK A. GODCHAUX III [E]
Houston, TX

JOHN R. HALL
Lexington, KY

L. HALL HARDAWAY, JR.
Nashville, TN

H. RODES HART
Nashville, TN

JOANNE F. HAYES
Nashville, TN

JOHN R. INGRAM
Nashville, TN

ORRIN H. INGRAM
Nashville, TN

ALICE JI
Reston, VA

J. HICKS LANIER
Atlanta, GA

EDWARD A. MALLOY, C.S.C.
Notre Dame, IN

DELBERT MANN [E]
Los Angeles, CA

ALYNE QUEENER MASSEY [E]
Nashville, TN

JACKSON W. MOORE
Birmingham, AL

NANCY P. MULFORD
Dallas, TX

SHARON M. MUNGER
Dallas, TX

EDWARD G. NELSON
Nashville, TN

JUDSON G. RANDOLPH, M.D. [E]
Nashville, TN

FREDERICK B. RENTSCHLER
Scottsdale, AZ

CATHERINE B. REYNOLDS
McLean, VA

JOHN W. RICH [E]
Nashville, TN

KENNETH L. ROBERTS
Nashville, TN

JOE L. ROBY
New York, NY

EUGENE B. SHANKS, JR.
Greenwich, CT

MARISSA N. SHRUM
New York, NY

RICHARD H. SINKFIELD
Atlanta, GA

HEATHER M. SOUDER
Cambridge, MA

CAL TURNER
Nashville, TN

EUGENE H. VAUGHAN
Houston, TX

THOMAS B. WALKER, JR. [E]
Dallas, TX

LEVI WATKINS, JR., M.D.
Baltimore, MD

JAMES A. WEBB, JR. [E]
Nashville, TN

DUDLEY BROWN WHITE [E]
Nashville, TN

W. RIDLEY WILLS II
Franklin, TN

DAVID K. WILSON [E]
Nashville, TN

J. LAWRENCE WILSON
Rosemont, PA

REBECCA WEBB WILSON
Memphis, TN

WILLIAM M. WILSON
Nashville, TN

E Emerita/Emeritus Trustee

MARIBETH GERACIOTI, B.A., Assistant Secretary of the University

Vanderbilt University Administration

GORDON GEE, J.D., Ed.D., Chancellor
NICHOLAS S. ZEPPOS, J.D., Provost; Vice Chancellor for Academic Affairs
LAUREN J. BRISKY, M.B.A., Vice Chancellor for Administration and Chief Financial Officer
HARRY R. JACOBSON, M.D., Vice Chancellor for Health Affairs
MICHAEL J. SCHOENFELD, M.S., Vice Chancellor for Public Affairs
WILLIAM T. SPITZ, M.B.A., Vice Chancellor for Investments; Treasurer
DAVID WILLIAMS II, J.D., LL.M., M.B.A., Vice Chancellor for Student Life and University Affairs; General Counsel; Secretary of the University

CAMILLA PERSSON BENBOW, Ed.D., Dean of Peabody College
JAMES W. BRADFORD, JR., J.D., Dean of Owen Graduate School of Management
COLLEEN CONWAY-WELCH, Ph.D., Dean of the School of Nursing
STEVEN G. GABBE, M.D., Dean of the School of Medicine
KENNETH F. GALLOWAY, Ph.D., Dean of the School of Engineering
DENNIS G. HALL, Ph.D., Associate Provost for Research and Graduate Education
JAMES HUDNUT-BEUMLER, Ph.D., Dean of the Divinity School
RICHARD C. MCCARTY, Ph.D., Dean of the College of Arts and Science
EDWARD L. RUBIN, J.D., Dean of the Law School
MARK WAIT, D.M.A., Dean of Blair School of Music

Graduate School

DENNIS G. HALL, Ph.D., Associate Provost for Research and Graduate Education
RICHARD L. HOOVER, Ph.D., Associate Dean
STEVEN H. SMARTT, Ph.D., Assistant Provost for Research and Graduate Education
BARRY J. KENDALL, B.S., Registrar

Graduate Faculty Council

Dennis G. Hall, Chair
Carolyn Evertson, Vice Chair
Emmanuele DiBenedetto, Secretary

EXECUTIVE COMMITTEE. Associate Provost Dennis G. Hall, Chair. Professors Clifford A. Ball, Emmanuele DiBenedetto, Carolyn Evertson, Melanie Lutenbacher, John S. McClure.

COLLEGE OF ARTS AND SCIENCE. Professors Akram Aldroubi, Jo-Anne Bachorowski, Victoria Burrus, Emmanuele DiBenedetto, James Foster, John McCarthy, Dana Nelson, Virginia Scott, Helmut Smith, Michael Stone.

DIVINITY SCHOOL. Professor John S. McClure.

SCHOOL OF ENGINEERING. Professors Bharat Bhuva, Sankaran Mahadevan, Bridget Rogers, Jeremy P. Spinrad.

SCHOOL OF MEDICINE. Professors Scott Hiebert, Hassane Mchaorab.

SCHOOL OF NURSING. Professor Melanie Lutenbacher.

OWEN GRADUATE SCHOOL OF MANAGEMENT. Professor Clifford A. Ball.

PEABODY COLLEGE. Professor Carolyn Evertson.

EX OFFICIO. Chancellor Gordon Gee, Provost Nicholas Zeppos, Deans Camilla P. Benbow, James W. Bradford, Colleen Conway-Welch, Steven G. Gabbe, Kenneth F. Galloway, James Hudnut-Beumler, Richard C. McCarty.

University Honors Held by Members of the Vanderbilt Faculty

The Harvie Branscomb Distinguished Professor Award, begun in 1964 and awarded annually for a period of one year, recognizes the total accomplishment of a faculty member in furthering the aims of the University. The award is made by the Chancellor on recommendation of the Consultative Committee of the Faculty Senate.

1964 AMOS CHRISTIE, Professor of Pediatrics
1965 WILLARD B. JEWELL, Professor of Geology
1966 AVERY LEISERSON, Professor of Political Science
1967 NICHOLAS GEORGESCU-ROEGEN, Distinguished Professor of Economics
1968 CHARLES RAWLINSON PARK, Professor of Physiology
1969 JAMES PHILIP HYATT, Professor of Old Testament
1970 CHARLES F. DELZELL, Professor of History
1971 DEWEY W. GRANTHAM, Professor of History
1972 ELLIOT V. NEWMAN, Joe and Morris Werthan Professor of Experimental Medicine
1973 WILLIAM H. NICHOLLS, Professor of Economics
1974 BJARNI JÓNSSON, Distinguished Professor of Mathematics
1975 D. STANLEY TARBELL, Distinguished Professor of Chemistry
1976 JOHN W. WADE, Distinguished Professor of Law
1977 WALTER HARRELSON, Distinguished Professor of Old Testament
1978 SIDNEY P. COLOWICK, American Cancer Society–Charles Hayden Foundation Professor of Microbiology
1979 GRANT W. LIDDLE, Professor of Medicine
1980 RENDIGS T. FELS, Professor of Economics
1981 DOUGLAS E. LEACH, Professor of History
1982 OSCAR TOUSTER, Professor of Molecular Biology
1983 JOSEPH H. HAMILTON, Landon C. Garland Distinguished Professor of Physics
1984 MILDRED R. STAHLMAN, Professor of Pediatrics
1985 HANS H. STRUPP, Distinguished Professor of Psychology
1986 WILLIAM C. HAVARD, JR., Professor of Political Science
1987 ALFRED A. BAUMEISTER, Professor of Psychology and Special Education
1988 LEON W. CUNNINGHAM, Professor of Biochemistry
1989 SALLIE MCFAGUE, E. Rhodes and Leona B. Carpenter Professor of Theology
1990 DAVID T. KARZON, Professor of Pediatrics
1991 LAURENCE D. LERNER, Edwin Mims Professor of English
1992 CAROLYN M. EVERTSON, Professor of Education
1993 FRANK CHYTIL, Professor of Biochemistry; General Foods Distinguished Professor of Nutrition; Assistant Professor of Medicine
1994 FRANK L. PARKER, Distinguished Professor of Environmental and Water Resources Engineering; Professor of Management of Technology
1995 MELVIN D. JOESTEN, Professor of Chemistry; Professor of Education
1996 ROBERT D. COLLINS, Professor of Pathology
1997 PAUL K. CONKIN, Distinguished Professor of History
1998 JOHN A. OATES, Thomas F. Frist Professor of Medicine
1999 TRAVIS I. THOMPSON, Professor of Psychology, Peabody College; Professor of Psychology, College of Arts and Science; Professor of Special Education; Professor of Psychiatry
2000 LAWRENCE J. MARNETT, Mary Geddes Stahlman Chair in Cancer Research; Professor of Biochemistry; Professor of Chemistry

2001 ANN P. KAISER, Professor of Special Education; Professor of Psychology, Peabody College; Director, Research Program on Communication, Cognitive, and Emotional Development, John F. Kennedy Center
2002 THOMAS R. HARRIS, Professor of Biomedical Engineering and Chair of the Department; Professor of Chemical Engineering; Professor of Medicine
2003 JOHN A. PHILLIPS III, David T. Karzon Professor of Pediatrics; Professor of Biochemistry; Professor of Medicine; Investigator, John F. Kennedy Center for Research on Human Development
2004 ROBERT S. DITTUS, Joe and Morris Werthan Professor of Investigative Medicine; Professor of Medicine; Director, Division of General Internal Medicine
2005 HAROLD L. MOSES, Hortense B. Ingram Professor of Molecular Oncology; Professor of Cancer Biology; Professor of Pathology; Professor of Medicine; Director, Emeritus, Vanderbilt-Ingram Cancer Center
2006 ELAINE SANDERS-BUSH, Professor of Pharmacology; Professor of Psychiatry; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Director, Vanderbilt Brain Institute

The Alexander Heard Distinguished Service Professor Award was established in 1982 to honor Chancellor Alexander Heard at the time of his retirement. The title will be conferred annually, for a one-year period, upon a faculty member in recognition of contributions to the analysis and solution of contemporary problems in the society.

1983 DAVID J. WILSON, Professor of Chemistry
1984 DAVID RABIN, Professor of Medicine
1985 ERWIN C. HARGROVE, Professor of Political Science; Professor of Education
1986 ALFRED A. BAUMEISTER, Professor of Psychology, Peabody College
1987 WALTER HARRELSON, Distinguished Professor of Old Testament
1988 FRANK L. PARKER, Professor of Environmental and Water Resources Engineering; Professor of Management of Technology
1989 W. ANDERSON SPICKARD, JR., Professor of Medicine
1990 FRANK A. SLOAN, Centennial Professor of Economics
1991 LISTON O. MILLS, Oberlin Alumni Professor of Pastoral Theology and Counseling
1992 RICHARD A. PRIDE, Associate Professor of Political Science
1993 H. CARL HAYWOOD, Professor of Psychology, Peabody College; Professor of Neurology
1994 THOMAS A. MAHONEY, Frances Hampton Currey Professor of Organization Studies
1995 KARL B. SCHNELLE, JR., Professor of Chemical Engineering; Professor of Environmental Engineering
1996 SUSAN FORD WILTSHIRE, Professor of Classics
1997 KENNETH A. DODGE, Professor of Psychology; Professor of Psychiatry
1998 PAUL K. CONKIN, Distinguished Professor of History
1999 JONATHAN I. CHARNEY, Professor of Law
2000 HUGH DAVIS GRAHAM, Holland N. McTyeire Professor of History; Professor of Political Science
2001 JOHN J. SIEGFRIED, Professor of Economics
2002 DAVID J. ERNST, Professor of Physics
2003 VIRGINIA L. SHEPHERD, Professor of Pathology; Professor of Biochemistry; Professor of Medicine
2004 ELLEN B. GOLDRING, Professor of Educational Policy and Leadership

2005 KATHRYN M. EDWARDS, Professor of Pediatrics; Director, Division of Pediatric Clinical Research
2006 JAMES W. GUTHRIE, Professor of Public Policy and Education; Director, Peabody Center for Education Policy; Chair, Department of Leadership, Policy, and Organizations

The Earl Sutherland Prize for Achievement in Research was initiated in 1976. The recipient is chosen by the Chancellor on recommendation of the University Research Council.

1976 NICHOLAS GEORGESCU-ROEGEN, Distinguished Professor of Economics
1977 STANLEY COHEN, Distinguished Professor of Biochemistry; American Cancer Society Research Professor of Biochemistry
1978 CLAUDE PICHOIS, Distinguished Professor of French
1979 GRANT W. LIDDLE, Professor of Medicine
1980 JOHN W. WADE, Distinguished Professor of Law
1981 SIDNEY FLEISCHER, Professor of Molecular Biology
1982 BJARNI JÓNSSON, Distinguished Professor of Mathematics
1983 DONALD A. DAVIE, Andrew W. Mellon Professor of Humanities and Professor of English
1984 CHARLES RAWLINSON PARK, Professor of Physiology
1985 JON H. KAAS, Professor of Psychology
1986 LUBOMIR HNILICA, Professor of Biochemistry
1987 HANS H. STRUPP, Distinguished Professor of Psychology
1988 JOSEPH H. HAMILTON, Landon C. Garland Distinguished Professor of Physics
1989 PAUL K. CONKIN, Distinguished Professor of History
1990 TADASHI INAGAMI, Professor of Biochemistry
1991 EDWARD FARLEY, Drucilla Moore Buffington Professor of Theology
1992 JAMES F. BLUMSTEIN, Professor of Law
1993 THOMAS M. HARRIS, Centennial Professor of Chemistry
1994 JOHN H. EXTON, Professor of Molecular Physiology and Biophysics
1995 GISELA MOSIG, Professor of Molecular Biology
1996 HANS R. STOLL, Anne Marie and Thomas B. Walker Jr. Professor of Finance
1997 JOHN D. BRANSFORD, Centennial Professor of Psychology
1998 ALICE C. HARRIS, Professor of Linguistics and Chair of the Department of Germanic and Slavic Languages; Professor of Anthropology
1999 TRAVIS I. THOMPSON, Professor of Psychology, Peabody College; Professor of Psychology, College of Arts and Science; Professor of Special Education; Professor of Psychiatry
2000 RANDOLPH BLAKE, Centennial Professor of Psychology, College of Arts and Science; Investigator and Senior Fellow, John F. Kennedy Center
2001 F. PETER GUENGERICH, Professor of Biochemistry; Director, Center in Molecular Toxicology
2002 DAVID M. HERCULES, Centennial Professor of Chemistry
2003 LEONARD BICKMAN, Professor of Psychology, Peabody College; Associate Dean for Research, Peabody College; Professor of Psychiatry; Director, Mental Health Policy Center, Institute for Public Policy Studies; Member, John F. Kennedy Center for Research on Human Development
2004 HERBERT Y. MELTZER, Bixler/Johnson/Mays Professor of Psychiatry; Professor of Pharmacology; Director, Division of Psychopharmacology

2005 LYNN S. FUCHS, Professor of Special Education; Nicholas Hobbs Chair in Special Education and Human Development; Investigator, Vanderbilt Kennedy Center for Research on Human Development
DOUGLAS FUCHS, Professor of Special Education; Nicholas Hobbs Chair in Special Education and Human Development; Investigator, Vanderbilt Kennedy Center for Research on Human Development
2006 HANS R. STOLL, Anne Marie and Thomas B. Walker Jr. Professor of Finance; Director, Financial Markets Research Center

The Joe B. Wyatt Distinguished University Professor Award, created to honor Chancellor Wyatt upon his retirement in 2000, recognizes the development of significant new knowledge from research or exemplary innovation in teaching, particularly accomplishments that span multiple academic disciplines. The recipient of this annual award is chosen by the Chancellor from nominations by school deans and carries the title for one year. The award is endowed with funds designated by the Board of Trust.

2001 DOUGLAS FUCHS, Professor of Special Education; Co-Director, Research Program on Learning Accommodations for Individuals with Special Needs, John F. Kennedy Center
LYNN S. FUCHS, Professor of Special Education; Co-Director, Research Program on Learning Accommodations for Individuals with Special Needs, John F. Kennedy Center
2002 JUDY G. OZBOLT, Independence Chair in Nursing; Professor of Nursing; Professor of Biomedical Informatics
2003 PAUL A. COBB, Professor of Education
2004 MARSHALL C. EAKIN, Professor and Chair of History
2005 GARY F. JENSEN, Professor of Sociology and Chair of the Department; Professor of Religious Studies
2006 SANKARAN MAHADEVAN, Professor of Civil and Environmental Engineering; Professor of Mechanical Engineering

University Professorships

HOUSTON A. BAKER, JR., University Distinguished Professor of English
JAMES F. BLUMSTEIN, University Professor of Law and Medicine
JOHN C. GORE, Chancellor's University Professor of Radiology and Radiological Sciences, Biomedical Engineering, Molecular Physiology and Biophysics, and Physics
W. KIP VISCUSI, University Distinguished Professor of Law, Economics, and Management
JOHN P. WIKSWO, Gordon A. Cain University Professor of Physics, Biomedical Engineering, and Molecular Physiology and Biophysics

Named and Distinguished Professorships and Chairs

MARK E. ANDERSON, Jack and Betty Bailey Professor of Cardiology
ELLEN T. ARMOUR, E. Rhodes and Leona B. Carpenter Chair in Feminist Theology
CARLOS ARTEGA, Ingram Professor of Cancer Research
DAVID M. BADER, Gladys Parkinson Stahlman Chair in Cardiovascular Research
H. SCOTT BALDWIN, Katrina Overall McDonald Professor of Pediatrics
JEFFREY R. BALSER, James Tayloe Gwathmey Clinician Scientist
BRUCE BARRY, Brownlee O. Currey Professor of Management (Organization Studies)
R. DANIEL BEAUCHAMP, John C. Foshee Distinguished Chair in Surgery

JOSEPH D. BLACKBURN, JR., James A. Speyer Professor of Production Management
RICHARD BLACKETT, Andrew Jackson Professor of American History
RANDY D. BLAKELY, Allan D. Bass Chair in Pharmacology
ERIC W. BOND, Joe L. Roby Professor of Economics
MATTHEW D. BREYER, Catherine McLaughlin Hakin Chair in Medicine
KENDAL SCOT BROADIE, Stevenson Professor of Neurobiology
H. ALEX BROWN, Ingram Associate Professor of Cancer Research
REBECCA L. BROWN, Allen Professor of Law
J. PATOUT BURNS, Edward A. Malloy Professor of Catholic Studies
RICHARD CAPRIOLI, Stanley Cohen Professor of Biochemistry
DAVID P. CARBONE, Ingram Professor of Cancer Research
GRAHAM F. CARPENTER, Ingram Professor of Cancer Research
JONATHAN I. CHARNEY, Lee S. and Charles A. Speir Chair in Law
ALAN D. CHERRINGTON, Charles H. Best Professor of Diabetes Research
M. SHAI CHERRY, Mellon Assistant Professor of Jewish Studies
WILLIAM G. CHRISTIE, Ralph Owen Professor of Management (Finance)
LARRY R. CHURCHILL, Ann Geddes Stahlman Chair in Medical Ethics
ELLEN WRIGHT CLAYTON, Rosalind E. Franklin Professor of Genetics and Health Policy
JAY CLAYTON, William R. Kenan Jr. Professor of English
ROBERT COFFEY, Ingram Professor of Cancer Research
MARK A. COHEN, Justin Potter Professor of American Competitive Business
ROBERT D. COLLINS, John L. Shapiro Chair in Pathology
BRUCE E. COMPAS, Patricia and Rodes Hart Professor of Psychology and Human Development
JACQUELINE M. CONARD, Madison S. Wigginton Assistant Professor of Management
ALAIN CONNES, Distinguished Professor of Mathematics
PETER T. CUMMINGS, John Robert Hall Professor of Chemical Engineering
RICHARD L. DAFT, Ralph Owen Professor of Management (Organizational Studies)
RICHARD T. D'AQUILA, Addison B. Scovile Chair in Medicine
STEPHEN NEIL DAVIS, Rudolph H. Kampmeier Professor of Medicine
THADIOUS M. DAVIS, Gertrude Conaway Vanderbilt Professor of English
COLIN DAYAN, Robert Penn Warren Professor in the Humanities
ARTHUR A. DEMAREST, Ingram Professor of Anthropology
SUDHANSU K. DEY, Dorothy Overall Wells Chair in Pediatrics
TOM DILLEHAY, Distinguished Professor of Anthropology
RAYMOND N. DUBOIS, JR., Mina Cobb Wallace Chair in Gastroenterology and Cancer Prevention
TONY LEE EARLEY, Samuel Milton Fleming Associate Professor of English
JAMES W. ELY, JR., Milton R. Underwood Chair in Free Enterprise
RONALD B. EMESON, Joel C. Hardman Chair in Pharmacology
ELLEN H. FANNING, Stevenson Professor of Molecular Biology
LEONARD C. FELDMAN, Stevenson Professor of Physics
LUKE M. FROEB, William C. and Margaret W. Oehmig Professor of Entrepreneurship and Free Enterprise
ALFRED L. GEORGE, JR., Grant W. Liddle Professor of Medicine
JAMES RICHARD GOLDENRING, Paul Sanger Chair for Investigational Surgery
LENN E. GOODMAN, Andrew W. Mellon Professor in the Humanities
HUGH DAVIS GRAHAM, Holland N. McTyeire Professor of History
DARYL K. GRANNER, Joe C. Davis Chair in Biomedical Science
BARBARA HAHN, Distinguished Professor of German
JONATHAN L. HAINES, T. H. Morgan Professor of Human Genetics
JOSEPH H. HAMILTON, Landon C. Garland Distinguished Professor of Physics

HEIDI ELIZABETH HAMM, Earl W. Sutherland Jr. Professor of Pharmacology
THOMAS HARRIS, Orrin Ingram Distinguished Professor of Engineering
JACEK HAWIGER, Oswald T. Avery Professor of Microbiology and Immunology
GEORGE C. HILL, Levi Watkins Jr. Professor and Associate Dean for Diversity in Medical Education
PETER C. HODGSON, Charles G. Finney Professor of Theology
JAMES HUDNUT-BEUMLER, Anne Potter Wilson Distinguished Professor of American Religious History
BILLY GERALD HUDSON, Elliott V. Newman Professor of Medicine
TADASHI INAGAMI, Stanford Moore Chair in Biochemistry
ROBIN M. JENSEN, Luce Chancellor's Professor of the History of Christian Worship and Art
CHRISTOPHER M. S. JOHNS, Norman L. and Roselea J. Goldberg Professor of Art History
DALE A. JOHNSON, Drucilla Moore Buffington Professor of Church History
JON H. KAAS, Distinguished Professor of Psychology
NANCY J. KING, Lee S. and Charles A. Speir Professor of Law
VERA M. KUTZINSKI, Martha Rivers Ingram Professor of English
JONATHAN LAMB, Andrew W. Mellon Professor in the Humanities
ALEXANDER R. LAWTON III, Edward Claiborne Stahlman Professor of Pediatric Physiology and Cell Metabolism
M. DOUGLAS LEVAN, J. Lawrence Wilson Professor of Engineering
AMY-JILL LEVINE, Carpenter Professor of New Testament Studies
ANDREW J. LINK, Ingram Assistant Professor of Cancer Research
ELIZABETH LUNBECK, Nelson Tyrone Jr. Professor of American History
MARK A. MAGNUSON, Earl W. Sutherland, Jr. Professor of Molecular Physiology and Biophysics
HAROLD G. MAIER, David Daniels Allen Professor of Law
SALVATORE T. MARCH, David K. Wilson Professor of Management
LEAH S. MARCUS, Edwin Mims Professor of English
LAWRENCE J. MARNETT, Mary Geddes Stahlman Professor of Cancer Research
RONALD W. MASULIS, Frank K. Houston Professor of Finance
LYNN M. MATRISIAN, Ingram Professor of Cancer Research
JOHN S. MCCLURE, Charles G. Finney Professor of Homiletics
THOMAS R. MCCOY, Tarkington Chair in Teaching Excellence
RALPH MCKENZIE, Distinguished Professor of Mathematics
M. DOUGLAS MEEKS, Cal Turner Chancellor's Chair in Wesleyan Studies
BONNIE J. MILLER-MCLEMORE, Carpenter Professor of Pastoral Theology
JASON D. MORROW, F. Tremaine Billings Professor of Medicine and Pharmacology
HAROLD L. MOSES, Benjamin F. Byrd Jr. Professor of Clinical Oncology
DANA NELSON, Gertrude Conaway Vanderbilt Professor of English
ERIC G. NEILSON, Hugh J. Morgan Chair in Medicine
JOHN A. OATES, Thomas F. Frist Chair in Medicine
KELLY OLIVER, W. Alton Jones Professor of Philosophy
RICHARD L. OLIVER, Valere Blair Potter Professor of Management (Marketing)
MARIE C. ORGEBIN-CRIST, Lucius E. Burch Professor of Reproductive Physiology and Family Planning
ROBERT H. OSSOFF, Guy M. Maness Chair in Otolaryngology
SOKRATES T. PANTELIDES, William A. and Nancy F. McMinn Professor of Physics
FRANK L. PARKER, Distinguished Professor of Environmental and Water Resources Engineering
JOHN A. PHILLIPS III, David T. Karzon Chair in Pediatrics
NED ALLEN PORTER, Stevenson Professor of Chemistry
JENNIFER F. REINGANUM, E. Bronson Ingram Professor of Economics

J. ROBERT ROBERTS, Ingram Professor of Cancer Research
DAVID ROBERTSON, Elton Yates Professor of Autonomic Disorders
DAN M. RODEN, William Stokes Chair in Experimental Therapeutics
MACE L. ROTHENBERG, Ingram Professor of Cancer Research
HENRY EARL RULEY, Ingram Professor of Cancer Research
SAMUEL ANDREW SANTORO, Dorothy B. and Theodore R. Austin Chair in Pathology
JACK M SASSON, Mary Jane Werthan Professor of Jewish Studies and Hebrew Bible
JEFFREY D. SCHALL, E. Bronson Ingram Professor of Neuroscience
LARRY L. SCHUMAKER, Stevenson Professor of Mathematics
FERNANDO F. SEGOVIA, Oberlin Graduate Professor of New Testament
MARGARET ELEANOR SETJE-EILERS, Mellon Assistant Professor of German
RICHARD C. SHELTON, James G. Blakemore Chair in Psychiatry
SUZANNA SHERRY, Cal Turner Professor of Law and Leadership
HELMUT W. SMITH, Martha Rivers Ingram Professor of History
HORTENSE J. SPILLERS, Gertrude Conaway Vanderbilt Professor of English
SUBRAMANIAM SRIRAM, William C. Weaver III Chair in Neurology
HANS R. STOLL, Anne Marie and Thomas B. Walker Jr. Professor of Finance
ARNOLD W. STRAUSS, James C. Overall Chair in Pediatrics
JOHN J. STUHR, W. Alton Jones Professor of Philosophy
KENT D. SYVERUD, Garner Anthony Professor of Law
JANOS SZTIPANOVITS, E. Bronson Ingram Distinguished Professor of Engineering
RANDALL S. THOMAS, John S. Beasley Professor of Law and Business
ROBERT B. THOMPSON, New York Alumni Chancellor's Chair in Law
CECELIA TICHI, William R. Kenan Jr. Professor of English
DANIEL H. USNER, JR., Holland M. McTyeire Professor of History
DOUGLAS E. VAUGHAN, C. Sidney Burwell Professor of Medicine
BART VICTOR, Cal Turner Professor of Moral Leadership
MICHAEL R. WATERMAN, Natalie Overall Warren Distinguished Chair in Biochemistry
BARBARA WEINLICH, Mellon Assistant Professor of Classical Studies
JOHN P. WIKSWO, JR., Gordon A. Cain University Professor; A. B. Learned Professor in Living State Physics

Centennial Professorships

RANDOLPH BLAKE, Centennial Professor of Psychology
JAMES F. BLUMSTEIN, Centennial Professor of Law
JOHN D. BRANSFORD, Centennial Professor of Psychology
JAMES A. CADZOW, Centennial Professor of Electrical Engineering
JEROME CHRISTENSEN, Centennial Professor of English
EMMANUELE DIBENEDETTO, Centennial Professor of Mathematics
JOHN HALPERIN, Centennial Professor of English
DAVID M. HERCULES, Centennial Professor of Chemistry
JOHN LACHS, Centennial Professor of Philosophy
GORDON D. LOGAN, Centennial Professor of Psychology
ARTHUR M. MELLOR, Centennial Professor of Mechanical Engineering
ALEXANDER OL'SHANSKIY, Centennial Professor of Mathematics
FRANCISCO RUIZ-RAMÓN, Centennial Professor of Spanish
MARK V. SAPIR, Centennial Professor of Mathematics
JEFFREY A. SCHOENBLUM, Centennial Professor of Law
MITCHELL A. SELIGSON, Centennial Professor of Political Science
TAYLOR G. WANG, Centennial Professor of Materials Science and Engineering; Director of the Applied Physics Program

Faculty

D. KILPATRICK ABBOT, Assistant Professor of Biological Sciences
B.Sc. (Georgia 1989); M.Sc. (Simon Fraser 1994); Ph.D. (Arizona 2002) [2003]

SHERIF ABDELWAHED, Research Assistant Professor of Electrical Engineering and Computer Science
B.Sc., M.Sc. (Cairo 1989, 1993); Ph.D. (Toronto 2002) [2002]

SARKI A. ABDULKADIR, Associate Professor of Pathology; Associate Professor of Cancer Biology
B.S., M.D. (Ahmadu Bello [Nigeria] 1984, 1990); Ph.D. (Johns Hopkins 1995) [2005]

MARK DAVID ABKOWITZ, Professor of Civil and Environmental Engineering; Professor of Management of Technology
B.S., M.S., Ph.D. (Massachusetts Institute of Technology 1974, 1976, 1980) [1987]

BROOKE ANN ACKERLY, Assistant Professor of Political Science
B.A. (Williams 1988); M.A., Ph.D. (Stanford 1993, 1997) [2001]

JULIE A. ADAMS, Assistant Professor of Computer Science; Assistant Professor of Computer Engineering
B.S., B.B.A. (Siena 1989, 1990); M.S.E., Ph.D. (Pennsylvania 1993, 1995) [2002]

CHRISTIAN ROBERT AHLIN, Assistant Professor of Economics
B.S. (Duke 1995); M.A., Ph.D. (Chicago 1997, 2001) [2001]

JOHN F. AHNER, Professor of Mathematics
B.A., Ph.D. (Delaware 1967, 1972) [1974]

CHRISTOPHER R. AIKEN, Professor of Microbiology and Immunology
B.S. (California, Santa Barbara 1983); Ph.D. (Illinois 1991) [1995]

ROYAL G. ALBRIDGE, Professor of Physics
B.S. (Ohio State 1955); Ph.D. (California, Berkeley 1960) [1961]

AKRAM ALDROUBI, Professor of Mathematics
M.S. (Swiss Federal Institute of Technology 1982); Ph.D. (Carnegie-Mellon 1987) [1997]

CONSTANTIN ALIFERIS, Assistant Professor of Biomedical Informatics; Assistant Professor of Cancer Biology
M.D. (Athens 1990); M.S., Ph.D. (Pittsburgh 1994, 1998) [2000]

PATRICIA FLYNN ALLEN, Assistant Professor of Hearing and Speech Sciences; Director, Division of Rehabilitation
B.A. (Fordham 1970); M.A., M.S. (Vanderbilt 1973, 1976) [1990]

MICHAEL L. ALLES, Research Associate Professor of Electrical Engineering
B.E., M.S., Ph.D. (Vanderbilt 1987, 1990, 1992) [2003]

JOSEPH M. AMANN, Research Assistant Professor of Cancer Biology
B.S. (Pennsylvania State 1985); Ph.D. (Alabama 1996) [2003]

ADAM W. ANDERSON, Associate Professor of Biomedical Engineering; Associate Professor of Radiology and Radiological Sciences; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Williams 1982); M.S., M.Phil., Ph.D. (Yale 1984, 1986, 1990) [2002]

ALEXANDER R. A. ANDERSON, Visiting Professor of Cancer Biology
B.Sc. (Paisley 1991); M.Sc., Ph.D. (Dundee 1992, 1995) [2005]

KATHRYN H. ANDERSON, Professor of Economics
B.A. (Kentucky 1972); M.Econ., Ph.D. (North Carolina State 1974, 1978) [1980]

MARK E. ANDERSON, Jack and Betty Bailey Professor of Cardiology; Professor of Medicine; Professor of Pharmacology
B.A. (Macalester 1981); Ph.D., M.D. (Minnesota 1987, 1989) [1996]

VICTOR ANDERSON, Associate Professor of Christian Ethics; Associate Professor of African American and Diaspora Studies; Associate Professor of Religious Studies (On leave spring 2007)
A.B. (Trinity Christian 1982); M.Div., Th.M. (Calvin Theological Seminary 1986, 1990); M.A., Ph.D. (Princeton 1991, 1992) [1992]

BRUCE HANS APPEL, Associate Professor of Biological Sciences; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (McPherson 1983); Ph.D. (Utah 1993) [1998]

ELLEN T. ARMOUR, E. Rhodes and Leona B. Carpenter Chair in Feminist Theology; Professor of Theology
B.A. (Stetson 1980); M.A., Ph.D. (Vanderbilt 1989, 1993) [2006]

RICHARD N. ARMSTRONG, Professor of Biochemistry; Professor of Chemistry
B.S. (Western Illinois 1970); Ph.D. (Marquette 1975) [1995]

DOMINIK ARONSKY, Assistant Professor of Biomedical Informatics; Assistant Professor of Emergency Medicine
M.D. (University of Berne 1989); Ph.D. (Utah 2000) [2000]

CARLOS L. ARTEAGA, Vice Chancellor's Professor of Breast Cancer Research; Professor of Medicine; Professor of Cancer Biology
M.D. (Guayaquil 1979) [1988]

JOHN R. ASHFORD, Assistant Clinical Professor of Hearing and Speech Sciences
B.S., M.S. (Southern Mississippi 1967, 1968) [1985]

DANIEL H. ASHMEAD, Associate Professor of Hearing and Speech Sciences; Associate Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
Sc.B. (Brown 1976); Ph.D. (Minnesota 1983) [1992]

JEREMY ATACK, Professor of Economics; Professor of History
B.A. (Cambridge 1971); Ph.D. (Indiana 1976) [1993]

JAMES B. ATKINSON III, Professor of Pathology
B.A., M.D., Ph.D. (Vanderbilt 1973, 1981, 1981) [1985]

THOMAS M. AUNE, Associate Professor of Medicine; Associate Professor of Microbiology and Immunology
B.S. (Rhodes 1973); Ph.D. (Tennessee 1976) [1995]

MICHAEL L. AURBACH, Professor of Art
B.A., B.S.J., M.A., B.F.A. (Kansas 1974, 1976, 1979, 1981); M.F.A. (Southern Methodist 1983) [1986]

LINDA L. AUTHER, Adjunct Assistant Professor of Hearing and Speech Sciences
B.S., M.Ed. (James Madison 1986, 1988); Ph.D. (Vanderbilt 1996) [1997]

WILLIAM AVILÉS, Assistant Professor of Political Science
B.A. (Florida International 1993); M.A., Ph.D. (California, RIverside 1997, 2001) [2001]

MALCOLM JOHN AVISON, Professor of Radiology and Radiological Sciences; Assistant Professor of Neurology; Professor of Pharmacology
B.A. (Cambridge 1979); M.Phil., Ph.D. (Yale 1985, 1986) [2003]

JOHN C. AYERS, Professor of Earth and Environmental Sciences
B.S. (SUNY, College at Fredonia 1985); M.S. (Pennsylvania State 1988); Ph.D. (Rensselaer Polytechnic Institute 1991) [1991]

ANNALISA AZZONI, Assistant Professor of Hebrew Bible and Ancient Near East Studies
Laurea (Instituto di Glottologia, Università degli Studi di Milan 1989); Ph.D. (Johns Hopkins 2001) [2003]

BRIAN O. BACHMANN, Assistant Professor of Chemistry
B.S. (Virginia Polytechnic Institute 1992); M.S. (Southern Methodist 1994); M.A., Ph.D. (Johns Hopkins 1997, 2000) [2003]

JO-ANNE BACHOROWSKI, Associate Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Holy Cross 1980); M.S., Ph.D. (Wisconsin 1986, 1991) [1995]

DAVID M. BADER, Gladys Parkinson Stahlman Professor of Cardiovascular Research; Professor of Medicine; Professor of Cell and Developmental Biology
B.A. (Augustana 1974); Ph.D. (North Dakota 1978) [1995]

MALCOLM E. BAIRD, Research Professor of Civil and Environmental Engineering
B.E. (Vanderbilt 1969); M.Sc., Master of City Planning (Georgia Institute of Technology 1971, 1971); Ph.D. (Vanderbilt 1999); P.E. [2001]

HOUSTON A. BAKER, JR., University Distinguished Professor of English; Professor of English
B.A. (Howard 1965); M.A., Ph.D. (California, Los Angeles 1966, 1968) [2006]

R. ROBERT BALCARCEL, Assistant Professor of Chemical Engineering
B.S. (California, Berkeley 1993); Ph.D. (Massachusetts Institute of Technology 1999) [1999]

LEWIS V. BALDWIN, Professor of Religious Studies
B.A. (Talladega 1971); M.A., M.Div. (Rochester 1973, 1975); Ph.D. (Northwestern 1980) [1984]

CLIFFORD A. BALL, Professor of Management (Finance and Statistics)
B.Sc., M.Sc. (Nottingham 1974, 1975); Ph.D. (New Mexico 1980) [1990]

DEAN WILLIAMS BALLARD, Professor of Microbiology and Immunology
B.S. (Marshall 1978); M.S., Ph.D. (Illinois 1981, 1984) [1992]

ROBERT DALE BALLOU, Associate Professor of Public Policy and Education
B.A. (Stanford 1972); Ph.D. (Yale 1989) [2002]

JEFFREY R. BALSER, Associate Vice Chancellor for Research; James Tayloe Gwathmey Clinician-Scientist Professor; Professor of Anesthesiology; Professor of Pharmacology
B.S.E. (Tulane 1984); M.D., Ph.D. (Vanderbilt 1990, 1990) [1998]

THEODORE BAPTY, Research Assistant Professor of Electrical Engineering
B.S. (Pennsylvania 1985); M.S., Ph.D. (Vanderbilt 1995, 1995) [1992]

JOEY V. BARNETT, Associate Professor of Pharmacology; Associate Professor of Medicine; Associate Professor of Microbiology and Immunology
B.S. (Indiana State [Evansville] 1980); Ph.D. (Vanderbilt 1986) [1992]

ROBERT J. BARRETT, Associate Professor of Psychology, College of Arts and Science
B.A. (Lycoming 1963); M.A., Ph.D. (Southern Illinois 1966, 1967) [1970]

BRUCE BARRY, Professor of Management and Sociology
B.A., M.A. (Virginia 1980, 1981); Ph.D. (North Carolina 1991) [1991]

ROBERT F. BARSKY, Professor of French and Comparative Literature; Professor of English
B.A. (Brandeis 1984); M.A., Ph.D. (McGill 1987, 1992) [2003]

ERIC J. BARTH, Assistant Professor of Mechanical Engineering
B.S. (California, Berkeley 1994); M.S., Ph.D. (Georgia Institute of Technology 1996, 2000) [2002]

GREGORY F. BARZ, Assistant Professor of Musicology (Ethnomusicology); Assistant Professor of Anthropology; Associate Professor of Religion
B.M. (North Carolina School of the Arts 1982); M.A. (Chicago 1992); Ph.D. (Brown 1997) [1998]

PRODYOT K. BASU, Professor of Civil and Environmental Engineering
B.S. (Lucknow 1957); B.S. (Jadavpur 1961); M.S. (Calcutta 1963); D.S. (Washington University 1977); P.E. [1984]

FRANZ JOSEF BAUDENBACHER, Assistant Professor of Biomedical Engineering; Assistant Professor of Physics
B.Sc. (Tübingen [Germany] 1985); Ph.D. (Technical University of Munich 1994) [1997]

R. DANIEL BEAUCHAMP, John Clinton Foshee Distinguished Professor of Surgery; Chair of the Section of Surgical Sciences; Professor of Surgery; Professor of Cell and Developmental Biology; Professor of Cancer Biology
B.S. (Texas Tech 1978); M.D. (Texas 1982) [1994]

GEORGE BECKER, Associate Professor of Sociology
B.A. (SUNY, College at New Paltz 1964); M.A. (Columbia 1968); M.S., Ph.D. (SUNY, Stony Brook 1972, 1976) [1977]

VEREEN M. BELL, Professor of English
B.A. (Davidson 1955); Ph.D. (Duke 1959) [1961]

CAMILLA P. BENBOW, Patricia and Rodes Hart Dean of Education and Human Development, Peabody College; Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A., M.S., Ed.D. (Johns Hopkins 1977, 1978, 1980, 1981) [1998]

STEPHEN D. BENNING, Assistant Professor of Psychology
B.A. (Rice 2000); M.A. (Minnesota 2004) [2006]

BRETT V. BENSON, Assistant Professor of Political Science
B.A. (Brigham Young 1998); M.A., Ph.D. (Duke 2006, 2006) [2006]

MARK BERENDS, Associate Professor of Public Policy and Education
B.A. (Calvin 1985); M.S., Ph.D. (Wisconsin 1988, 1992) [2002]

M. FRÄNCILLE BERGQUIST, Associate Dean of the College of Arts and Science; Associate Professor of Spanish
B.A., M.A., Ph.D. (Texas Tech 1968, 1970, 1977) [1977]

SUSAN BERK-SELIGSON, Associate Professor of Latin American Studies and Spanish
B.A. (City University of New York 1967); M.A. (Pittsburgh 1971); Ph.D. (Arizona 1978) [2004]

FRED H. BESS, Professor of Hearing and Speech Sciences and Chair of the Department; Professor of Otolaryngology; Member, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Carthage 1962); M.S. (Vanderbilt 1964); Ph.D. (Michigan 1970) [1976]

MICHAEL D. BESS, Professor of History
B.A. (Reed 1979); M.A., Ph.D. (California, Berkeley 1983, 1989) [1989]

ALBERT H. BETH, Professor of Molecular Physiology and Biophysics
B.S. (Murray State 1974); Ph.D. (Vanderbilt 1977) [1977]

NEIL ADRI BHOWMICK, Assistant Professor of Urologic Surgery; Assistant Professor of Cancer Biology
B.S. (Florida 1991); Ph.D. (Georgia 1998) [2003]

BHARAT L. BHUVA, Associate Professor of Electrical Engineering; Associate Professor of Computer Engineering
B.Sc. (Maharaja Sayajirao University of Baroda 1982); M.S., Ph.D. (North Carolina State 1984, 1987) [1987]

LEONARD BICKMAN, Associate Dean for Research, Peabody College; Professor of Psychology, Peabody College; Director, Center for Evaluation and Program Improvement, Peabody College; Professor of Psychiatry; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (City College of New York 1963); M.A. (Columbia 1965); Ph.D. (City University of New York 1969) [1981]

DIETMAR BISCH, Professor of Mathematics and Chair of the Department
Hauptdiplom (Universität Karlsruhe [Germany] 1987); Ph.D. (California, Los Angeles 1991) [2002]

GAUTAM BISWAS, Professor of Computer Science; Professor of Computer Engineering; Professor of Management of Technology
B.Tech. (Indian Institute of Technology, Bombay 1977); M.S., Ph.D. (Michigan State 1980, 1983) [1987]

JOSEPH D. BLACKBURN, JR., James A. Speyer Professor of Production Management (Operations); Professor of Management (Operations Management)
B.E. (Vanderbilt 1963); M.S. (Wisconsin 1964); Ph.D. (Stanford 1971) [1979]

RICHARD BLACKETT, Andrew Jackson Professor of American History; Professor of History
B.A. (Keele [England] 1969); M.A. (Manchester [England] 1973) [2002]

TIMOTHY S. BLACKWELL, Associate Professor of Medicine; Associate Professor of Cell and Developmental Biology; Associate Professor of Cancer Biology
B.A. (Vanderbilt 1983); M.D. (Alabama 1988) [1995]

RANDOLPH BLAKE, Centennial Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Texas 1967); M.A., Ph.D. (Vanderbilt 1969, 1972) [1988]

RANDY D. BLAKELY, Allan D. Bass Professor of Pharmacology; Professor of Psychiatry; Director, Center for Molecular Neuroscience; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Emory 1981); Ph.D. (Johns Hopkins 1987) [1995]

ROBERT W. BLANNING, Professor of Management (Telecommunications and Electronic Commerce)
B.S. (Pennsylvania State 1958); M.S. (Case Western Reserve 1964); Ph.D. (Pennsylvania 1971) [1980]

MARK J. BLITON, Associate Professor of Medicine; Associate Professor of Obstetrics and Gynecology; Assistant Professor of Philosophy; Chief, Clinical Ethics Consultation Service, VUMC
B.A. (Allegheny 1984); Ph.D. (Vanderbilt 1993) [1993]

JAMES J. BLOOM, Mellon Assistant Professor of Art History
B.A. (Dartmouth 1993); M.A., Ph.D. (Duke 1999, 2002) [2005]

PAUL E. BOCK, Professor of Pathology; Professor of Medicine
B.A. (California, San Diego 1971); Ph.D. (Washington University 1976) [1991]

ERIK M. BOCZKO, Assistant Professor of Biomedical Informatics
B.A. (Manhattanville 1998); Ph.D. (Carnegie Mellon 1995); Ph.D. (Georgia Institute of Technology 2002) [2002]

ROBERT E. BODENHEIMER, JR., Assistant Professor of Computer Science
B.S., B.A., M.S. (Tennessee 1986, 1987); Ph.D. (California Institute of Technology 1995) [2000]

GERMAIN B. BÖER, Professor of Management (Accounting)
B.S. (Saint Edwards 1960); M.B.A. (Texas Tech 1961); Ph.D. (Louisiana State 1964); C.P.A. [1977]

NICOLAS P. B. BOLLEN, Associate Professor of Management (Finance)
B.A. (Cornell 1988); M.B.A., Ph.D. (Duke 1993, 1997) [2001]

ERIC W. BOND, Joe L. Roby Professor of Economics; Professor of Economics and Chair of the Department
B.S. (Lehigh 1974); M.A., Ph.D. (Rochester 1977, 1979) [2003]

A. B. BONDS, Professor of Electrical Engineering and Associate Department Chair, Department of Electrical Engineering and Computer Science; Professor of Computer Engineering and Director of the Program; Professor of Biomedical Engineering
A.B. (Cornell 1968); M.S., Ph.D. (Northwestern 1972, 1974) [1980]

WILLIAM JAMES BOOTH, Professor of Political Science; Professor of Philosophy
B.A., M.A. (McGill 1975, 1978); Ph.D. (Harvard 1982) [1996]

MARK R. BOOTHBY, Professor of Microbiology and Immunology; Associate Professor of Medicine
B.S. (Wisconsin 1976); M.D., Ph.D. (Washington University 1983, 1983) [1992]

JASON BORGE, Assistant Professor of Spanish
B.A. (Pomona 1987); M.A. (Columbia 1991); M.A. (California, Santa Barbara 1997); Ph.D. (California, Berkeley 2002) [2002]

DARRYL J. BORNHOP, Professor of Chemistry
B.S., M.A. (Missouri 1980, 1982); Ph.D. (Wyoming 1987) [2003]
BARBARA C. BOWEN, Professor of French, Emerita
B.A. (Oxford 1958); Doctorat de l'Université (Paris 1962); M.A. (Oxford 1962) [1987]
ALAN RAY BOWERS, Associate Professor of Civil and Environmental Engineering
B.C.E., M.C.E., Ph.D. (Delaware 1976, 1978, 1982); P.E. [1982]
JAMES W. BRADFORD, JR., Dean, Owen Graduate School of Management; Ralph Owen Professor of the Practice of Management
B.A. (Florida 1969); J.D. (Vanderbilt 1973) [2002]
LEONARD ALAN BRADSHAW, Research Assistant Professor of Surgery; Research Assistant Professor of Physics; Adjunct Assistant Professor of Biomedical Engineering
B.S. (Abilene Christian 1990); M.S., Ph.D. (Vanderbilt 1992, 1995) [1996]
STEPHEN J. BRANDT, Professor of Medicine; Professor of Cancer Biology; Professor of Cell and Developmental Biology
B.S. (Duke 1976); M.D. (Emory 1981) [1990]
ALAN R. BRASH, Professor of Pharmacology
B.A. (Cambridge 1970); Ph.D. (Edinburgh 1973) [1977]
GENE W. BRATT, Associate Professor of Hearing and Speech Sciences
B.A. (Calvin 1969); M.A. (Michigan State 1975); Ph.D. (Vanderbilt 1980) [1980]
CHARLES A. BRAU, Professor of Physics
B.S. (Cornell 1961); A.M., Ph.D. (Harvard 1962, 1965) [1988]
BRAD RONNELL BRAXTON, Associate Professor of Homiletics and New Testament (On leave fall 2006)
B.A. (Virginia 1991); M.Phil. (Oxford 1993); Ph.D. (Emory 1999) [2004]
JOHN M. BRAXTON, Professor of Education
B.A. (Gettysburg 1967); M.A. (Colgate 1968); D.Ed. (Pennsylvania State 1980) [1992]
BRENDAN R. BREAM, Senior Lecturer in Earth and Environmental Sciences
B.A., B.S. (California, Santa Barbara 1995, 1995); M.S., Ph.D. (Tennessee 1999, 2003) [2004]
MATTHEW D. BREYER, Catherine McLaughlin Hakim Professor of Medicine; Associate Professor of Molecular Physiology and Biophysics
B.S. (Michigan 1975); M.D. (Harvard 1979) [1985]
RICHARD M. BREYER, Professor of Medicine; Professor of Pharmacology
B.S. (Michigan 1978); M.S., Ph.D. (Massachusetts Institute of Technology 1982, 1988) [1991]
ROBERT C. BRIGGS, Associate Professor of Pathology
B.S., M.A. (Northern Michigan 1966, 1972); Ph.D. (Vermont 1976) [1976]
BRANDI CLAY BRIMMER, Assistant Professor of History (effective September 2006)
B.A. (Spelman 1995); M.A. (California, Los Angeles 1999) [2006]
KENDAL SCOT BROADIE, Stevenson Professor of Neurobiology; Professor of Biological Sciences; Professor of Pharmacology; Director for Research Program on Developmental Neurobiology and Plasticity, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Oregon 1989); Ph.D. (Cambridge [England] 1994) [2002]
ARTHUR J. BRODERSEN, Professor of Electrical Engineering, Emeritus; Professor of Computer Engineering, Emeritus
B.S., M.S., Ph.D. (California, Berkeley 1961, 1963, 1966) [1974]
SUSAN L. BROOKS, Clinical Professor of Law
A.B., A.M. (Chicago 1983, 1984); J.D. (New York 1990) [1993]
CHRISTOPHER BRIAN BROWN, Assistant Professor of Pediatrics; Assistant Professor of Pharmacology
B.S. (Auburn 1990); Ph.D. (Vanderbilt 1997) [2003]

H. ALEX BROWN, Associate Professor of Pharmacology; Ingram Associate Professor of Cancer Research; Associate Professor of Chemistry
B.S. (Florida Institute of Technology 1983); M.S. (Syracuse 1986); Ph.D. (North Carolina 1992) [2002]

STEVEN HOLLOWAY BROWN, Associate Professor of Biomedical Informatics; Chief Information Officer V.A.M.C.
A.B., M.D. (Brown 1981, 1987) [1994]

TONY N. BROWN, Assistant Professor of Sociology; Fellow, Institute of Public Policy Studies
B.S. (Maryland, Eastern Shore 1991); M.A., Ph.D. (Michigan 1993, 1998) [2001]

PETER BUERHAUS, Valere Potter Chair in Nursing; Senior Associate Dean for Research, School of Nursing; Professor of Nursing
B.S.N. (Mankato State 1976); M.S.N. (Michigan 1981); Ph.D. (Wayne State 1990); R.N. [2000]

M. CANDICE BURGER, Assistant Professor of Hearing and Speech; Assistant Professor of Psychiatry
B.S. (Tennessee 1974); Ph.D. (Washington University 1985) [1985]

RAYMOND F. BURK, Professor of Medicine; Professor of Pathology; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Mississippi 1963); M.D. (Vanderbilt 1968) [1987]

J. PATOUT BURNS, Edward A. Malloy Professor of Catholic Studies; Professor of Religious Studies
B.A., M.A. (Spring Hill 1963, 1964); M.Div. (Regis [Canada] 1970); M.Th. (University of St. Michael's College [Canada] 1971); Ph.D. (Yale 1974) [1999]

VICTORIA A. BURRUS, Associate Professor of Spanish
B.S., M.A., Ph.D. (Wisconsin 1974, 1976, 1985) [1986]

JAMES P. BYRD, JR., Assistant Professor of American Religious History; Assistant Dean for the Graduate Department of Religion
B.A. (Gardner-Webb 1988); M.Div. (Duke 1991); M.A., Ph.D. (Vanderbilt 1997, 1999) [1999]

JAMES A. CADZOW, Centennial Professor of Electrical Engineering, Emeritus; Professor of Computer Engineering, Emeritus
B.S. (Buffalo 1958); M.S. (SUNY, Buffalo 1963); Ph.D. (Cornell 1964) [1988]

WILLIAM CAFERRO, Associate Professor of History
B.A. (Haverford 1984); Ph.D. (Yale 1992) [1998]

ROBERT L. CALDWELL, Assistant Professor of Orthopaedics and Rehabilitation; Assistant Professor of Cancer Biology
B.S., B.A. (Centenary College of Louisiana !998, 1998); Ph.D. (Vanderbilt 2003) [2005]

MARY N. CAMARATA, Assistant Professor of Hearing and Speech Sciences
B.A. (San Diego State 1979); M.S. (Purdue 1983) [1998]

STEPHEN M. CAMARATA, Professor of Hearing and Speech Sciences; Associate Professor of Special Education; Director for Research Program on Communication and Learning, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A. (San Diego State 1979, 1981); Ph.D. (Purdue 1984) [1990]

KAREN E. CAMPBELL, Associate Professor of Sociology and Interim Chair of the Department
A.B. (Randolph-Macon Woman's 1977); M.A., Ph.D. (North Carolina 1982, 1985) [1985]

KIMBERLY ANN CANDIDO, Instructor in Medicine
B.S. (Michigan 1998); M.D. (University of Michigan Medical School 2003) [2006]

JEFFREY A. CANTER, Assistant Professor of Molecular Physiology and Biophysics
B.A. (Kenyon 1977); M.D. (Cincinnati 1981); M.P.H. (Vanderbilt 2003) [1989]

RICHARD M. CAPRIOLI, Stanley Cohen Professor of Biochemistry; Professor of Pharmacology; Professor of Chemistry; Director, Center in Mass Spectrometry
B.S., Ph.D. (Columbia 1965, 1969) [1998]

DAVID P. CARBONE, Professor of Medicine; Professor of Cell and Developmental Biology; Professor of Cancer Biology; Harold L. Moses Professor of Cancer Research
B.A. (Amherst 1977); M.D., Ph.D. (Johns Hopkins 1985, 1985) [1996]

DAVID LEE CARLTON, Associate Professor of History
B.A. (Amherst 1970); M.A., M.Phil., Ph.D. (Yale 1974, 1974, 1977) [1983]

GRAHAM F. CARPENTER, Professor of Biochemistry; Professor of Medicine
B.S., M.S. (Rhode Island 1966, 1969); Ph.D. (Tennessee 1974) [1974]

LAURA M. CARPENTER, Assistant Professor of Sociology
B.S., B.A. (Boston University 1991); M.A., Ph.D. (Pennsylvania 1995, 1999) [2002]

THOMAS H. CARR, Frank W. Mayborn Professor of Cognitive Studies; Professor of Psychology
B.A. (Lake Forest 1970); M.A.T. (Chicago 1972); Ph.D. (Vanderbilt 1975) [2005]

KATHERINE BLUE CARROLL, Assistant Professor of Political Science
B.A. (Indiana 1992); M.A., Ph.D. (Virginia 1996, 2001) [2006]

BRUCE D. CARTER, Associate Professor of Biochemistry
B.S. (Alma 1986); Ph.D. (Michigan 1992) [1997]

CLINT E. CARTER, Professor of Biological Sciences
B.A., M.A. (Loma Linda 1965, 1967); Ph.D. (California, Los Angeles 1971) [1973]

VIVIEN A. CASAGRANDE, Professor of Cell and Developmental Biology; Professor of Psychology, College of Arts and Science; Professor of Ophthalmology and Visual Sciences; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Colorado 1964); Ph.D. (Duke 1973) [1976]

MONICA J. CASPER, Associate Professor of Sociology; Director, Women's and Gender Studies Program
B.A. (Chicago 1988); Ph.D. (California, San Francisco 1995) [2004]

KENNETH C. CATANIA, Associate Professor of Biological Sciences
B.S. (Maryland 1989); M.S., Ph.D. (California, San Diego 1992, 1994) [1997]

JOHN J. CATERINA, Adjunct Professor of Cancer Biology
B.A. (Saint Anselm 1987); Ph.D. (Alabama, Birmingham 1993) [2005]

G. ROGER CHALKLEY, Senior Associate Dean, Biomedical Research, Education, and Training; Professor of Molecular Physiology and Biophysics; Professor of Medical Education and Administration
B.A., M.A., D.Phil. (Oxford 1961, 1962, 1964) [1986]

PAUL K. CHANEY, Professor of Management (Accounting)
B.S. (Indiana, Fort Wayne 1975); M.B.A., Ph.D. (Indiana 1977, 1983); C.P.A., C.M.A. [1983]

CHARLES RICHARD CHAPPELL, Research Professor of Physics; Director, Science and Research Communications; Executive Director, Dyer Observatory
B.A. (Vanderbilt 1965); Ph.D. (Rice 1968) [1997]

JAMES DAVID CHAPPELL, Research Assistant Professor of Pediatrics; Assistant Professor of Pathology
B.S., M.S. (Murray State 1988, 1991); Ph.D., M.D. (Vanderbilt 1997, 2001) [2005]

RAVI S. CHARI, Professor of Surgery; Associate Professor of Cancer Biology
M.D. (Saskatchewan 1989) [2001]

ANCHADA CHAROENROOK, Assistant Professor of Management (Finance)
B.S. (Chulalongkorn [Thailand] 1988); M.S., Ph.D. (University of Washington 1992, 1995); M.S., Ph.D. (Michigan 1999, 2000) [2000]

VERA A. STEVENS CHATMAN, Professor of the Practice of Human and Organizational Development; Professor of Medical Education and Administration
B.A., M.A. (Fisk 1970, 1972); Ph.D. (Vanderbilt 1976) [1994]

WALTER J. CHAZIN, Professor of Biochemistry; Professor of Physics; Director, Center for Structural Biology
B.Sc. (McGill 1975); Ph.D. (Concordia 1983) [1999]

JIN CHEN, Associate Professor of Medicine; Associate Professor of Cell and Developmental Biology; Associate Professor of Cancer Biology
M.D. (Shanghai Medical [China] 1984); Ph.D. (Harvard 1991) [1997]

KONG Y. CHEN, Assistant Professor of Medicine; Assistant Professor of Surgery
B.S. (Tennessee Technological 1993); Ph.D. (Vanderbilt 1997) [1997]

TINA YIH-TING CHEN, Associate Professor of English
B.A., M.A. (Georgetown 1992, 1993); Ph.D. (California, Berkeley 1998) [1998]

ALAN D. CHERRINGTON, Charles H. Best Professor of Diabetes Research; Professor of Molecular Physiology and Biophysics and Chair of the Department; Professor of Medicine
B.Sc. (New Brunswick 1967); M.Sc., Ph.D. (Toronto 1969, 1972) [1974]

CHIN CHIANG, Associate Professor of Cell and Developmental Biology; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (SUNY, Buffalo 1984); M.D., Ph.D. (Washington State 1986, 1990) [1997]

WILLIAM G. CHRISTIE, Frances Hampton Currey Professor of Finance; Professor of Law
B.Com. hons. (Queen's [Ontario] 1978); M.B.A., Ph.D. (Chicago 1980, 1989) [1989]

CHANG YONG CHUNG, Assistant Professor of Pharmacology
B.S., M.S. (Seoul National [Korea] 1986, 1988); Ph.D. (Duke 1995) [2001]

CHRISTINE HWAYONG CHUNG, Assistant Professor of Medicine
B.S. (California. Berkeley 1991); M.S. (Johns Hopkins 1994); M.D. (Eastern Virginia 1998) [2003]

LARRY R. CHURCHILL, Ann Geddes Stahlman Professor of Medical Ethics; Professor of Medicine; Professor of Religion; Professor of Philosophy
B.A. (Rhodes 1967); M.Div., Ph.D. (Duke 1970, 1973) [2002]

JAMES H. CLARKE, Professor of the Practice of Civil and Environmental Engineering; Professor of Earth and Environmental Sciences
B.A. (Rockford 1967); Ph.D. (Johns Hopkins 1973) [1989]

ELLEN WRIGHT CLAYTON, Professor of Pediatrics; Professor of Law; Rosalind E. Franklin Professor of Genetics and Health Policy; Director, Genetics Health Policy Center; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Duke 1974); M.S. (Stanford 1976); J.D. (Yale 1979); M.D. (Harvard 1985) [1988]

JAY CLAYTON, William R. Kenan Jr. Professor of English; Professor of English and Chair of the Department
B.A. (Yale 1974); Ph.D. (Virginia 1979) [1988]

DAVID E. CLIFFEL, Assistant Professor of Chemistry
B.S./B.E.E. (Dayton 1992); Ph.D. (Texas 1998) [2000]

R. WILBURN CLOUSE, Associate Professor of Education
B.A. (David Lipscomb 1959); M.A. (Middle Tennessee State 1968); Ph.D. (Peabody 1977) [1969]

CHARLES E. COBB, Research Associate Professor of Molecular Physiology and Biophysics; Associate Professor of Nursing
B.S., M.S. (Michigan Technological 1980, 1981); Ph.D. (Vanderbilt 1986) [1990]

PAUL A. COBB, Professor of Education
B.Sc. (Bristol 1975); M.A., Ed.D. (Georgia 1980, 1983) [1992]

ROBERT J. COFFEY, JR., Professor of Medicine; Professor of Cell and Developmental Biology; Joe B. Wallace Professor of Medicine; Ingram Professor of Cancer Research
A.B. (Princeton 1970); M.D. (Georgetown 1976) [1986]

MARK A. COHEN, Justin Potter Distinguished Professor of American Competitive Business (Economics); Senior Associate Dean, Owen Graduate School of Management
B.S.F.S. (Georgetown 1978); M.A., Ph.D. (Carnegie-Mellon 1983, 1985) [1986]

PIERRE ROBERT COLAS, Assistant Professor of Anthropology
Bachelor's (Hamburg [Germany] 1999); Ph.D. (Bonn [Germany] and Cologne [Germany] 2004) [2006]

ROGER J. COLBRAN, Associate Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.Sc. (Bristol 1982); Ph.D. (Newcastle upon Tyne 1985) [1986]

DAVID A. COLE, Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (St. Olaf 1976); M.A., Ph.D. (Houston 1980, 1983) [2001]

ROBERT D. COLLINS, John L. Shapiro Professor of Pathology
B.A., M.D. (Vanderbilt 1948, 1951) [1957]

WILLIAM J. COLLINS, Associate Professor of Economics
B.A., M.A., Ph.D. (Harvard 1993, 1995, 1998) [1998]

BRUCE E. COMPAS, Professor of Psychology, Peabody College; Patricia and Rodes Hart Professor of Psychology and Human Development; Professor of Pediatrics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A., Ph.D. (California, Los Angeles 1973, 1975, 1980) [2002]

DONALD L. COMPTON, Assistant Professor of Special Education; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Michigan 1983); M.S., Ph.D. (Northwestern 1986, 1993) [2000]

JACQUELINE M. CONARD, Madison S. Wigginton Assistant Professor of Management (Marketing)
B.B.A. (Iowa 1988); M.B.A. (North Carolina 1997); Ph.D. (Duke 2003) [2003]

BETH ANN CONKLIN, Associate Professor of Anthropology
A.B. (Colorado College 1976); Ph.D. (California, San Francisco 1980) [1991]

JOHN P. CONLEY, Professor of Economics
B.A. (Chicago 1984); M.A., Ph.D. (Rochester 1987, 1990) [2002]

PETER JEFFREY CONN, Professor of Pharmacology; Director, Program in Translational Neuropharmacology
B.S. (Lee 1981); Ph.D. (Vanderbilt 1986) [2003]

ALAIN CONNES, Distinguished Professor of Mathematics
B.S., Ph.D. (École Normale Supérieure [Paris] 1970, 1973) [2003]

EDWARD GAGE CONTURE, Professor of Hearing and Speech Sciences; Director, Division of Graduate Studies; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Emerson 1967); M.S. (Northwestern 1968); Ph.D. (Iowa 1972) [1997]

COLLEEN CONWAY-WELCH, Nancy and Hilliard Travis Professor of Nursing; Dean of the School of Nursing; Professor of Nursing
B.S. (Georgetown 1965); M.S.N. (Catholic 1969); Ph.D. (New York 1973); R.N., C.N.M. [1984]

BRUCE COOIL, Associate Professor of Management (Statistics)
B.S., M.S. (Stanford 1975, 1976); Ph.D. (Pennsylvania 1982) [1982]

GEORGE E. COOK, Associate Dean for Research and Graduate Studies, School of Engineering; Professor of Electrical Engineering
B.E. (Vanderbilt 1960); M.S. (Tennessee 1961); Ph.D. (Vanderbilt 1965); P.E. [1963]

THOMAS H. COOK, Assistant Professor of Nursing
B.S.N. (Loyola, Chicago 1968); M.S.N. (Saint Louis 1972); Ph.D. (Vanderbilt 1994); R.N. [1992]

TIMOTHY J. COOPER, Assistant Professor of Pediatrics
B.A. (Christian Brothers College 1986); M.A. (Middle Tennessee State 1992); Psy.D. (Spalding 1999) [2006]

JACKIE D. CORBIN, Professor of Molecular Physiology and Biophysics
B.S. (Tennessee Technological 1963); Ph.D. (Vanderbilt 1968) [1971]

DAVID S. CORDRAY, Professor of Public Policy; Professor of Psychology, Peabody College; Senior Fellow, Institute for Public Policy Studies
B.A., M.A. (California State, Northridge 1972, 1974); Ph.D. (Claremont 1979) [1989]

PAMELA C. CORLEY, Assistant Professor of Political Science
B.S. (Georgia Institute of Technology 1989); J.D., M.A., Ph.D. (Georgia State 1995, 2003, 2005) [2005]
ANNE L. CORN, Professor of Special Education; Member, Vanderbilt Kennedy Center for Research on Human Development (On leave spring 2007)
B.S. (Syracuse 1972); M.A. (California State, San Francisco 1973); Ed.M., Ed.D. (Columbia 1978, 1980) [1992]
DANIEL B. CORNFIELD, Professor of Sociology
A.B., A.M., Ph.D. (Chicago 1974, 1977, 1980) [1980]
DAVID CORTEZ, Assistant Professor of Biochemistry; Ingram Assistant Professor of Cancer Research
B.S. (Illinois 1993); Ph.D. (Duke 1997) [2002]
TIMOTHY L. COVER, Associate Professor of Medicine; Assistant Professor of Microbiology and Immunology
B.S. (Muhlenberg 1980); M.D. (Duke 1984) [1990]
EDWARD CODY CRASE, Clinical Instructor in Emergency Medicine
B.A. (Vanderbilt 1996); M.D. (University of Kentucky College of Medicine 2001) [2006]
KATHERINE B. CRAWFORD, Associate Professor of History
B.A. (Columbia College 1988); M.S., Ph.D. (Chicago 1991, 1997) [1999]
PHILIP S. CROOKE III, Professor of Mathematics; Professor of Education
B.S. (Stevens Institute of Technology 1966); Ph.D. (Cornell 1970) [1970]
JAMES E. CROWE, JR., Professor of Pediatrics; Ingram Professor of Cancer Research; Professor of Microbiology and Immunology
B.S. (Davidson 1983); M.D. (North Carolina 1987) [1995]
ROBERT L. CROWSON, JR., Professor of Education
A.B., M.A.T. (Oberlin 1961, 1962); Ph.D. (Chicago 1974) [1993]
MARIO CRUCINI, Associate Professor of Economics
B.A. (Western Ontario 1985); M.A., Ph.D. (Rochester 1989, 1991) [1999]
STEVEN E. CSORNA, Associate Professor of Physics
B.S. (New York 1968); M.A., Ph.D. (Columbia 1970, 1974) [1978]
YI CUI, Assistant Professor of Computer Science; Assistant Professor of Computer Engineering
B.S., M.S. (Tsinghua [China] 1997, 1999); Ph.D. (Illinois 2005) [2005]
PETER T. CUMMINGS, John R. Hall Professor of Chemical Engineering
B. Math. (Newcastle 1976); Ph.D. (Melbourne 1980) [2002]
JOSEPH J. CUNNINGHAM, Associate Professor of Special Education; Chair, Department of Human and Organizational Development
B.S., M.S. (Syracuse 1963, 1965); Ed.D. (Illinois 1970) [1969]
KEVIN P. M. CURRIE, Assistant Professor of Anesthesiology; Assistant Professor of Pharmacology
B.Sc. (Edinburgh 1990); Ph.D. (London 1994) [2002]
ANASTASIA C. CURWOOD, Assistant Professor of African American and Diaspora Studies; Assistant Professor of History
A.B. (Bryn Mawr 1996); M.A., Ph.D. (Princeton 1999, 2003) [2005]
KAREN D'APOLITO, Assistant Professor of Nursing; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S.N. (Trenton State 1979); M.S.N. (Case Western Reserve 1981); Ph.D. (University of Washington 1994); R.N. [1998]
RICHARD T. D'AQUILA, Addison B. Scoville Professor of Medicine; Professor of Microbiology and Immunology; Director, Center for AIDS Research
B.A. (Yale 1975); M.D. (Albert Einstein 1979) [2001]

RICHARD L. DAFT, Brownlee O. Currey Jr. Professor of Management (Organization Studies)
B.S.B.A. (Nebraska 1967); M.B.A., Ph.D. (Chicago 1971, 1974) [1989]
ARTHUR FREDERICK DALLEY II, Professor of Cell and Developmental Biology
B.S., Ph.D. (Utah 1970, 1975) [1998]
WILLIAM W. DAMON, Professor of Economics and Business Administration; Professor of Management; Director, Managerial Studies
B.S. (Purdue 1965); M.B.A., Ph.D. (Cornell 1967, 1970) [1976]
THAO P. DANG, Assistant Professor of Medicine; Assistant Professor of Cancer Biology
B.S. (Chestnut Hill 1988); M.D. (Medical College of Pennsylvania 1993) [2000]
KATE DANIELS, Associate Professor of English; Associate Dean, College of Arts and Science
B.A., M.A. (Virginia 1975, 1977); M.F.A. (Columbia 1980) [1995]
BRADLEY R. DART, Instructor in Orthopaedics and Rehabilitation
B.A. (Newman 1997); M.D. (University of Kansas School of Medicine 2001) [2006]
SANJOY K. DAS, Associate Professor of Pediatrics; Associate Professor of Cancer Biology
B.Sc., M.Sc., Ph.D. (Calcutta [India] 1976, 1978, 1988) [2002]
PRAN KRISHNA DATTA, Assistant Professor of Surgery; Assistant Professor of Cancer Biology
B.Sc., M.Sc. (Burdwan [India] 1979, 1982); Ph.D. (Bose Institute [India] 1987) [2000]
ANDREW F. DAUGHETY, Professor of Economics; Professor of Law
B.S. (Case Institute of Technology 1969); M.S., Ph.D. (Case Western Reserve 1971, 1972); M.A. (Southern California 1975) [1995]
UTPAL P. DAVE, Assistant Professor of Medicine; Assistant Professor of Cancer Biology
M.D. (Northwestern 1994) [2005]
JEFFREY MARK DAVIDSON, Professor of Pathology
B.S. (Tufts 1967); M.S., Ph.D. (Stanford 1969, 1975) [1986]
JIMMY L. DAVIDSON, Professor of Electrical Engineering; Professor of Materials Science and Engineering; Professor of Management of Technology
B.A. (Hendrix 1962); M.S., Ph.D. (Columbia 1965, 1967) [1989]
DENISE D. DAVIS, Assistant Professor of Psychology, College of Arts and Science
B.S. (Florida State 1977); Ph.D. (South Carolina 1982) [1988]
STEPHEN NEIL DAVIS, Rudolph H. Kampmeier Professor of Medicine; Professor of Molecular Physiology and Biophysics; Director, Division of Diabetes and Endocrinology
M.B.,B.S., Ph.D. (London 1979, 1991) [1988]
VICTORIA J. DAVIS, Assistant Clinical Professor of Human and Organizational Development
B.A. (Illinois, Springfield 1988); M.Ed., Ed.D. (Vanderbilt 1993, 1999) [2001]
BENOIT M. DAWANT, Professor of Electrical Engineering; Professor of Computer Engineering; Professor of Radiology and Radiological Sciences
M.S. (Université catholique de Louvain 1982); Ph.D. (Houston 1987) [1988]
SHEILA PATRICIA DAWLING, Associate Professor of Pathology
B.Sc. (Surrey 1976); Ph.D. (London 1981) [1996]
COLIN DAYAN, Robert Penn Warren Professor in the Humanities; Professor of English
B.A. (Smith 1971); Ph.D. (City University Graduate Center 1980) [2004]
MARK P. DE CAESTECKER, Assistant Professor of Medicine; Assistant Professor of Cancer Biology; Assistant Professor of Cell and Developmental Biology
M.B.B.S. (London 1980); Ph.D. (Manchester 1994) [2000]
KENNETH A. DEBELAK, Associate Professor of Chemical Engineering
B.S. (Dayton 1969); M.S., Ph.D. (Kentucky 1973, 1977) [1977]
NATHALIE A. DEBRAUWERE-MILLER, Assistant Professor of French
Ph.D. (Emory 2000) [2001]
LOUIS J. DEFELICE, Professor of Pharmacology
B.S., M.S. (Florida State 1962, 1964); Ph.D. (Calgary 1967) [1995]
PAUL J. DEHART, Associate Professor of Theology
A.B. (Chicago 1987); M.A.R. (Yale 1990); Ph.D. (Chicago 1997) [1997]

ERIC DELPIRE, Professor of Anesthesiology; Associate Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S., M.S., Ph.D. (Liège [Belgium] 1981, 1983, 1989) [1997]
ARTHUR A. DEMAREST, Ingram Professor of Anthropology
B.A. (Tulane 1974); A.M., Ph.D. (Harvard 1977, 1981) [1983]
MARK R. DENISON, Professor of Pediatrics; Professor of Microbiology and Immunology
B.S., M.D. (Kansas 1977, 1980) [1991]
TERENCE S. DERMODY, Professor of Pediatrics; Professor of Microbiology and Immunology
B.S. (Cornell 1978); M.D. (Columbia 1982) [1990]
CHAND DESAI, Adjunct Assistant Professor of Pharmacology
A.B. (California, Berkeley 1980); Ph.D. (Massachusetts Institute of Technology 1989) [1997]
LAURA M. DESIMONE, Assistant Professor of Public Policy and Education
B.A. (Wesleyan 1990); M.P.A. (American 1991); Ph.D. (North Carolina 1996) [2001]
ARIEL Y. DEUTCH, Professor of Psychiatry; Professor of Pharmacology; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Vanderbilt 1973); Ph.D. (Georgia 1983) [1996]
CAROLYN DEVER, Professor of English; Associate Dean, College of Arts and Science
A.B. (Boston College 1988); A.M., Ph.D. (Harvard 1990, 1993) [1999]
SUDHANSU K. DEY, Dorothy Overall Wells Professor of Pediatrics; Professor of Cell and Developmental Biology; Professor of Pharmacology; Director, Division of Pediatric Reproductive Biology
B.Sc., M.Sc., Ph.D. (Calcutta [India] 1965, 1967, 1972) [2002]
EMMANUELE DIBENEDETTO, Centennial Professor of Mathematics; Professor of Molecular Physiology and Biophysics
B.A. (Università di Firenze 1975); Ph.D. (Texas 1979) [2000]
DENNIS C. DICKERSON, Professor of History
B.A. (Lincoln 1971); M.A., Ph.D. (Washington University 1974, 1978) [1999]
JAMES H. DICKERSON II, Assistant Professor of Physics
B.A. (Amherst 1994); M.A., Ph.D. (SUNY, Stony Brook 1999, 2002) [2004]
DAVID K. DICKINSON, Professor of Education
B.A. (Oberlin 1971); Ed.M. (Temple 1976); Ed.D. (Harvard 1982) [2005]
WILLIAM W. DICKINSON, Assistant Professor of Hearing and Speech Sciences
B.A., M.A. (Michigan State 1990, 1991) [2004]
ANDRE MICHAEL DIEDRICH, Research Assistant Professor of Medicine; Research Assistant Professor of Biomedical Engineering
M.D. (Second Medical Institute [Moscow] 1985); Ph.D. (Humboldt [Germany] 1991) [2000]
MARY S. DIETRICH, Research Assistant Professor of Psychiatry; Research Assistant Professor of Nursing
B.S. (Bethel 1979); M.S. (Fort Hays State 1982); Ph.D. (Vanderbilt 1996) [2002]
TOM D. DILLEHAY, Distinguished Professor of Anthropology; Professor of Anthropology and Chair of the Department
B.A. (North Texas 1970); Ph.D. (Texas 1976) [2004]
DAVID M. DILTS, Professor of Management of Technology and Director of the Program; Professor of Management
B.S. (California Polytechnic State 1972); M.B.A., Ph.D. (Oregon 1973, 1983) [2000]
ZHAOHUA DING, Assistant Professor of Radiology and Radiological Sciences; Assistant Professor of Electrical Engineering
B.E. (University of Electronic Science 1990); M.S., Ph.D. (Ohio State 1997, 1999) [2002]
PAULA H. DINKINS, Instructor in Medicine
B.S. (South Carolina 1999); M.D. (Medical University of South Carolina 2003) [2006]

IDIT DOBBS-WEINSTEIN, Associate Professor of Philosophy
B.A., M.A. (York [Canada] 1981, 1982); M.A., Ph.D. (Toronto 1983, 1987) [1987]
MARK D. DOES, Assistant Professor of Biomedical Engineering; Assistant Professor of Radiology and Radiological Sciences
B.S., M.S., Ph.D. (Alberta 1991, 1993, 1997) [2002]
PAUL R. DOKECKI, Professor of Psychology, Peabody College; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Manhattan 1962); M.A., Ph.D. (Peabody 1963, 1968) [1970]
RAFE M. DONAHUE, Research Associate Professor of Biostatistics
B.S. (Dayton 1987); Ph.D. (Colorado State 1992) [2005]
KATHARINE M. DONATO, Professor of Sociology
B.S. (New York Institute of Technology 1978); M.S.W. (Wisconsin, Milwaukee 1981); M.A., Ph.D. (SUNY, Stony Brook 1984, 1988) [2006]
LAWRENCE W. DOWDY, Professor of Computer Science; Professor of Computer Engineering
B.S. (Florida State 1974); A.M., Ph.D. (Duke 1976, 1977) [1981]
ANDREW W. DOZIER, Professor of the Practice of Electrical Engineering
B.S., M.S., Ph.D. (Vanderbilt 1969, 1972, 1974) [1996]
ROBERT A. DRISKILL, Professor of Economics
B.S. (Michigan State 1973); Ph.D. (Johns Hopkins 1978) [1992]
DANIELA DRUMMOND-BARBOSA, Assistant Professor of Cell and Developmental Biology
B.S. (Universidade Federal de Minas Gerais [Brazil] 1991); M.Phil., Ph.D. (Yale 1993, 1995) [2002]
RAYMOND N. DUBOIS, JR., Benjamin F. Byrd Jr. Professor of Molecular Oncology; Professor of Medicine; Professor of Cancer Biology; Professor of Cell and Developmental Biology; Director, Vanderbilt–Ingram Cancer Center
B.S. (Texas A & M 1977); Ph.D. (Texas, Dallas 1981); M.D. (Texas Health Science Center, San Antonio 1985) [1991]
KATHLEEN A. DWYER, Associate Professor of Nursing
B.S.N. (Akron 1979); M.S.N. (Case Western Reserve 1982); Ph.D. (Pittsburgh 1993); R.N. [1992]
ELISABETH MAY DYKENS, Professor of Psychology, Peabody College; Associate Director, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Mt. Holyoke 1979); M.A., Ph.D. (Kansas 1983, 1985) [2003]
MARSHALL C. EAKIN, Professor of History
B.A., M.A. (Kansas 1975, 1977); Ph.D. (California, Los Angeles 1981) [1983]
TONY LEE EARLEY, Samuel Milton Fleming Associate Professor of English; Associate Professor of English
B.A. (Warren Wilson 1983); M.F.A. (Alabama 1992) [1997]
FORD F. EBNER, Professor of Psychology, College of Arts and Science; Professor of Cell and Developmental Biology; Investigator, Vanderbilt Kennedy Center for Research on Human Development
D.V.M. (Washington State 1958); Ph.D. (Maryland 1965) [1991]
PAUL H. EDELMAN, Professor of Mathematics; Professor of Law
B.A. (Swarthmore 1976); Ph.D. (Massachusetts Institute of Technology 1980) [2000]
BENJAMIN EDEN, Professor of Economics
B.S. (Hebrew 1971); Ph.D. (Chicago 1975) [2002]
ROBERT R. EHMAN, Professor of Philosophy, Emeritus
B.A. (Pomona 1957); M.A., Ph.D. (Yale 1959, 1961) [1967]
MONEEB EHTESHAM, Assistant Professor of Neurological Surgery; Assistant Professor of Cancer Biology
M.D. (Aga Khan [Pakistan] 1999) [2004]

KURT M. EICHHOLZ, Assistant Professor of Neurological Surgery
B.S. (St. Louis University 1994); M.S. (St. Louis University School of Medicine 1999) [2006]
BRANDT F. EICHMAN, Assistant Professor of Biological Sciences
B.S. (Mississippi 1993); Ph.D. (Oregon State 2000) [2004]
JOSIANE EID, Assistant Professor of Cancer Biology
B.S., M.D. (American University of Beirut 1979, 1983) [2002]
SARA PAULSON EIGEN, Assistant Professor of German
B.A. (Yale 1987); A.M., Ph.D. (Harvard 1995, 2001) [2001]
ELVIRA R. EIVAZOVA, Research Instructor in Molecular Physiology and Biophysics
B.Sc., M.Sc. (Lomonosov State [Russia] 1982, 1984); Ph.D. (Research Institute of Immunology 1990) [2005]
WA'EL EL-RIFAI, Professor of Surgery; Professor of Cancer Biology
M.D., M.Sc. (Ain Shams 1986, 1992); Ph.D. (Helsinki 1996) [2005]
MARK N. ELLINGHAM, Professor of Mathematics
B.S., M.S. (Melbourne 1981, 1983); Ph.D. (Waterloo 1986) [1986]
JAMES W. ELY, JR., Milton R. Underwood Chair in Free Enterprise; Professor of Law
A.B. (Princeton 1959); LL.B. (Harvard 1962); M.A., Ph.D. (Virginia 1968, 1971) [1972]
RONALD B. EMESON, Joel G. Hardman Associate Professor of Pharmacology and Assistant Director of Graduate Studies; Associate Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Johns Hopkins 1980); Ph.D. (Colorado 1986) [1991]
LYNN E. ENTERLINE, Professor of English
B.A. (Vanderbilt 1978); B.A. (Oxford 1981); M.A., Ph.D. (Cornell 1986, 1989) [1998]
JAMES A. EPSTEIN, Professor of History
B.A. (Sussex 1970); Ph.D. (Birmingham [England] 1977) [1986]
DAVID J. ERNST, Professor of Physics
S.B., Ph.D. (Massachusetts Institute of Technology 1965, 1970) [1992]
JENNIFER E. ESCALAS, Associate Professor of Management
B.A., M.B.A. (California, Los Angeles 1985, 1991); Ph.D. (Duke 1996) [2004]
FRANCISCO ESTRADA-BELLI, Assistant Professor of Anthropology
Laurea (Università di Roma 1991); Ph.D. (Boston University 1998) [2000]
HELEN B. EVERTS, Research Instructor in Biochemistry
B.S. (Pennsylvania State 1990); M.S., Ph.D. (Georgia 1995, 2000) [2005]
JOHN H. EXTON, Professor of Molecular Physiology and Biophysics; Professor of Pharmacology; Investigator, Howard Hughes Medical Institute
B.Med.Sc., M.B.,Ch.B. (New Zealand 1955, 1958); Ph.D., M.D. (Otago 1963, 1984) [1964]
JANET S. EYLER, Professor of the Practice of Education
B.A., M.Ed. (University of Washington 1966, 1970); Ph.D. (Indiana 1977) [1981]
MICHAEL E. EZELL, Assistant Professor of Sociology
B.A. (California, Davis 1996); M.A., Ph.D. (Duke 1999, 2002) [2002]
MARA FACCIO, Assistant Professor of Management (Finance)
B.A., M.A. (Pavia [Italy] 1994, 1995); M.Phil. (City University [London] 1997); Ph.D. (Catholic University [Milan] 1999) [2003]
GUO-HUANG FAN, Assistant Professor of Cancer Biology at Meharry Medical College; Assistant Professor of Cancer Biology at Vanderbilt
B.S. (Hubei Medical College [China] 1988); M.S. (Chengdu University 1991); Ph.D. (Shanghai Second Medical University 1996) [2001]
YANQIN FAN, Professor of Economics; Professor of Mathematics
B.Sc. (Jilin [China] 1985); M.A., Ph.D. (Western Ontario 1987, 1990) [2001]

HONG FANG, Assistant Professor of Microbiology and Immunology
B.Sc. (Fudan [Shanghai] 1982); Ph.D. (Illinois 1988) [1990]
ELLEN H. FANNING, Stevenson Professor of Biological Sciences
B.S. (Wisconsin 1968); Dr.rer.nat. (Cologne 1977) [1995]
DALE C. FARRAN, Professor of Education; Professor of Psychology, Peabody College; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (North Carolina 1965); Ph.D. (Bryn Mawr 1975) [1996]
SERGIO FAZIO, Professor of Medicine; Professor of Pathology
M.D. (Rome 1983); Ph.D. (Siena [Italy] 1989) [1993]
LEONARD C. FELDMAN, Stevenson Professor of Physics; Professor of Materials Science and Engineering
B.A. (Drew 1961); M.S., Ph.D. (Rutgers 1963, 1967) [1996]
DEVIN FERGUS, Assistant Professor of History
B.A., M.A. (North Carolina State 1992, 1994); M.A., M.Phil., Ph.D. (Columbia 1997, 1997, 2002) [2002]
GERALD FIGAL, Associate Professor of East Asian Studies; Associate Professor of History
B.A. (California, Santa Barbara 1985); M.A., Ph.D. (Chicago 1987, 1992) [2003]
DANIEL C. FILES, Instructor in Clinical Medicine
B.S. (University of the South 1999); M.D. (Mississippi 2003) [2006]
STUART G. FINDER, Assistant Professor of Medicine; Assistant Professor of Philosophy; Director, Center for Clinical and Research Ethics
B.S. (Allegheny 1983); M.A. (Colorado 1985); M.A. (Wisconsin 1988); Ph.D. (Utah 1991) [1991]
BARBARA MARY FINGLETON, Research Assistant Professor of Cancer Biology
B.Sc., Ph.D. (Dublin City University 1992, 1996) [2001]
MARY SUE FINO-SZUMSKI, Assistant Professor of Hearing and Speech Sciences
B.S. (Marywood 1986); M.S., Ph.D. (Vanderbilt 1987, 1997) [1997]
EDWARD F. FISCHER, Associate Professor of Anthropology; Director, Center for Latin American and Iberian Studies
B.A. (Alabama, Birmingham 1989); M.A., Ph.D. (Tulane 1995, 1995) [1996]
PAMELA FISHEL-INGRAM, Assistant Professor of Psychiatry; Assistant Professor of Pediatrics
B.A. (SUNY, Binghamton 1984); Ph.D. (Florida 1990) [1998]
DOUGLAS H. FISHER, Associate Professor of Computer Science; Associate Professor of Computer Engineering
B.S., M.S., Ph.D. (California, Irvine 1980, 1983, 1987) [1987]
EARL E. FITZ, Professor of Portuguese, Spanish, and Comparative Literature
B.A., M.A. (Iowa 1968, 1970); M.A. (CUNY, Queens 1973); Ph.D. (CUNY 1977) [1998]
FERN FITZHENRY, Instructor in Biomedical Informatics
B.S.N. (Pennsylvania 1974); M.D. (Illinois 1997) [2000]
J. MICHAEL FITZPATRICK, Professor of Computer Science; Professor of Computer Engineering; Professor of Radiology and Radiological Sciences; Professor of Neurological Surgery
B.S. (North Carolina 1967); Ph.D. (Florida State 1972); M.S. (North Carolina 1982) [1982]
KATHLEEN FLAKE, Assistant Professor of American Religious History
B.A. (Brigham Young 1974); J.D. (Utah 1980); M.A. (Catholic 1995); Ph.D. (Chicago 2000) [2000]
DANIEL M. FLEETWOOD, Professor of Electrical Engineering and Chair of the Department of Electrical Engineering and Computer Science; Professor of Physics
B.S., M.S., Ph.D. (Purdue 1980, 1981, 1984) [1999]
SARAH FOGEL, Assistant Professor of Nursing
B.M. (Boston University 1978); M.M. (Wayne State 1982); M.S.N., Ph.D. (Vanderbilt 1994, 2001); R.N. [1994]

AGNES B. FOGO, Professor of Pathology; Professor of Pediatrics; Professor of Medicine; Director, Division of Renal Pathology
B.A. (Tennessee, Chattanooga 1976); M.D. (Vanderbilt 1981) [1987]

LEONARD FOLGARAIT, Professor of Art History
B.A., M.A., Ph.D. (California, Los Angeles 1972, 1975, 1980) [1981]

DONNA Y. FORD, Professor of Special Education; Betts Chair of Education and Human Development
B.A., M.Ed., Ph.D. (Cleveland State 1984, 1988, 1991) [2004]

JAMES E. FOSTER, Professor of Economics; Senior Fellow, Institute for Public Policy Studies
B.A. (New College [Florida] 1977); M.A., Ph.D. (Cornell 1980, 1982) [1990]

SIMON FOUCART, Assistant Professor of Mathematics
Baccalauréat (Lycée Kléber [France] 1995); Licence de mathématiques (Université de Paris VI [France] 1999); Diplôme d'Ingénieur des Arts et Manufactures (Ecole Centrale Paris [France] 2001); Ph.D. (Cambridge [United Kingdom] 2005) [2006]

WILLIAM R. FOWLER, JR., Associate Professor of Anthropology
B.A. (University of the Americas 1972); M.A., Ph.D. (Calgary 1977, 1982) [1987]

ROBERT FOX, Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A., Ph.D. (Cincinnati 1957, 1963) [1963]

SHARRON H. FRANCIS, Research Professor of Molecular Physiology and Biophysics
B.S. (Western Kentucky 1965); Ph.D. (Vanderbilt 1970) [1976]

WILLIAM FRANKE, Associate Professor of Comparative Literature and Italian
B.A. (Williams 1978); M.A. (Oxford 1980); M.A. (California, Berkeley 1988); Ph.D. (Stanford 1991) [1991]

JEFFERY J. FRANKS, Professor of Psychology, College of Arts and Science
B.S. (Michigan State 1966); Ph.D. (Minnesota 1970) [1970]

MICHAEL L. FREEMAN, Professor of Radiation Oncology; Professor of Radiology and Radiological Sciences; Professor of Cancer Biology
B.S., Ph.D. (Colorado State 1974, 1978) [1983]

EDWARD H. FRIEDMAN, Professor of Spanish; Professor of Comparative Literature
B.A. (Virginia 1970); M.A., Ph.D. (Johns Hopkins 1971, 1974) [2000]

KATHERINE L. FRIEDMAN, Assistant Professor of Biological Sciences
B.A. (Carleton 1990); Ph.D. (University of Washington 1996) [2001]

RAYMOND A. FRIEDMAN, Professor of Management (Organization Studies)
B.A. (Yale 1980); A.M., Ph.D. (Chicago 1983, 1987) [1994]

MARK E. FRISSE, Accenture Professor of Biomedical Informatics
B.S. (Notre Dame 1974); M.S. (Stanford 1978); M.D., M.B.A. (Washington University 1987, 1997) [2004]

LUKE M. FROEB, William and Margaret Oehmig Associate Professor of Free Enterprise and Entrepreneurship (Managerial Economics)
A.B. (Stanford 1978); Ph.D. (Wisconsin 1983) [1993]

MARC FROMENT-MEURICE, Professor of French
M.A. (Paris X 1975); Ph.D. (Paris VIII 1979); Doctorat d'Etat (Nice, Sophia-Antipolis 1992) [1996]

VIVIEN GREEN FRYD, Professor of Art History; Professor of American Studies
B.A., M.A. (Ohio State 1974, 1977); Ph.D. (Wisconsin 1984) [1985]

DOUGLAS FUCHS, Professor of Special Education; Nicholas Hobbs Chair in Special Education and Human Development; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Johns Hopkins 1971); M.S. (Pennsylvania 1973); Ph.D. (Minnesota 1978) [1985]

LYNN S. FUCHS, Professor of Special Education; Nicholas Hobbs Chair in Special Education and Human Development; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Johns Hopkins 1972); M.S. (Pennsylvania 1973); Ed.S., Ph.D. (Minnesota 1977, 1981) [1985]

DANIEL J. FUNK, Assistant Professor of Biological Sciences
B.S. (Notre Dame 1989); Ph.D. (SUNY, Stony Brook 1996) [1999]

DAVID JON FURBISH, Professor of Earth and Environmental Sciences and Chair of the Department; Professor of Civil and Environmental Engineering
B.S. (North Carolina 1978); M.S. (California State 1981); Ph.D. (Colorado 1985) [2003]

DAVID H. FURSE, Adjunct Assistant Professor of Managerial Studies; Adjunct Professor of Management
A.B. (Georgia 1965); M.S (Illinois 1967); Ph.D. (Georgia State 1974) [2002]

MARCY SINGER GABELLA, Research Assistant Professor of Education
A.B. (Harvard 1985); M.A. (Columbia 1987); Ph.D. (Stanford 1991) [2004]

WILLIAM GABELLA, Research Assistant Professor of Physics
B.S. (Colorado School of Mines 1984); M.S., Ph.D. (Colorado 1987, 1991) [1994]

KATHY L. GACA, Associate Professor of Classics; Associate Professor of Religion
B.A., M.A. (Illinois 1982, 1984); Ph.D. (Toronto 1996) [1997]

CYNTHIA S. GADD, Research Associate Professor of Biomedical Informatics
B.S. (North Carolina State 1976); M.B.A. (Winthrop 1979); Ph.D. (Pittsburgh 1995); M.S. (Duke 1998) [2005]

DAVID GAILANI, Associate Professor of Pathology; Associate Professor of Medicine
B.A. (Cornell 1980); M.D. (Illinois 1984) [1995]

AURELIO GALLI, Associate Professor of Molecular Physiology and Biophysics
B.A., Ph.D. (Milan [Italy] 1988, 1992) [2002]

KENNETH F. GALLOWAY, Dean of the School of Engineering; Professor of Electrical Engineering
B.A. (Vanderbilt 1962); Ph.D. (South Carolina 1966) [1996]

ROBERT L. GALLOWAY, JR., Professor of Biomedical Engineering; Professor of Surgery; Professor of Neurological Surgery
B.S.E. (Duke 1977); M.E. (Virginia 1979); Ph.D. (Duke 1983) [1987]

JOSHUA T. GAMSE, Assistant Professor of Biological Sciences
B.A. (Rice 1994); Ph.D. (Massachusetts Institute of Technology 2000) [2005]

AMAR GANDE, Assistant Professor of Management (Finance)
B.Tech. (Indian Institute of Technology 1986); M.B.A. (Indian Institute of Management 1988); Ph.D. (New York 1997) [1997]

MAUREEN ANNE GANNON, Assistant Professor of Medicine; Assistant Professor of Molecular Physiology and Biophysics
B.S. (Molloy 1985); M.S. (Adelphi 1988); Ph.D. (Cornell 1995) [2001]

JUDY GARBER, Professor of Psychology, Peabody College; Professor of Psychiatry; Associate Professor of Psychology, College of Arts and Science; Senior Fellow, Institute for Public Policy Studies; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (SUNY, Buffalo 1973); Ph.D. (Minnesota 1987) [1985]

HARI P. GARBHARRAN, Adjunct Associate Professor of Education
B.A. (Durbin, Westville 1976); M.A. (Natal 1981); Ph.D. (Southern Illinois 1989) [2001]

ANDREW C. GARRABRANTS, Research Assistant Professor of Civil and Environmental Engineering
B.S., M.S., Ph.D. (Rutgers 1994, 1998, 2001) [2002]

ISABEL GAUTHIER, Associate Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Université du Québec à Montréal 1993); M.S., Ph.D. (Yale 1995, 1998) [1999]

VOLNEY P. GAY, Professor of Religious Studies and Chair of the Depar tment; Professor of Psychiatry; Professor of Anthropology
B.A. (Reed 1970); M.A., Ph.D. (Chicago 1973, 1976) [1979]

JOHN G. GEER, Professor of Political Science
B.A. (Franklin and Marshall 1980); M.A., Ph.D. (Princeton 1982, 1986) [1995]

JAY GELLER, Assistant Professor of Modern Jewish Culture
B.A. (Wesleyan 1975); A.M., Ph.D. (Duke 1980, 1985) [1994]

ALFRED L. GEORGE, JR., Grant W. Liddle Professor of Medicine; Associate Professor of Pharmacology; Director, Division of Genetic Medicine; Director, Institute of Integrative Genomics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Wooster 1978); M.D. (Rochester 1982) [1996]

GARY GERSTLE, Professor of History
B.A. (Brown 1976); M.A., Ph.D. (Harvard 1978, 1982) [2006]

MALCOLM GETZ, Associate Professor of Economics; Assistant to the Dean, College of Arts and Science
B.A. (Williams 1967); Ph.D. (Yale 1973) [1973]

SHAMINDRA KUMAR GHOSH, Assistant Professor of Mathematics
B.S. (St. Xavier's College, Calcutta [India] 1996); M.S., Ph.D. (Indian Statistical Institute, Bangalore [India] 1998, 2004) [2006]

GIANLUIGI GIANNELLI, Adjunct Assistant Professor of Cancer Biology
M.D. (Italy 1987) [2003]

JESSICA W. GILES, Assistant Professor of Psychology, Peabody College
B.A. (California, Berkeley 1997); Ed.M. (Harvard 1998); Ph.D. (California, San Diego 2004) [2004]

JONATHAN M. GILLIGAN, Senior Lecturer in Earth and Environmental Sciences
B.A. (Swarthmore 1982); Ph.D. (Yale 1991) [1995]

MARY JO STRAUSS GILMER, Associate Professor of Nursing; Associate Professor of Pediatrics; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S.N. (Michigan State 1971); M.S.N. (Illinois, Chicago 1978); M.B.A. (Queens 1989); Ph.D. (North Carolina 1997); R.N. [1998]

KATHRYN T. GINES, Assistant Professor of African American and Diaspora Studies; Assistant Professor of Philosophy
B.A. (Spelman 1999); M.A., Ph.D. (Memphis 2001, 2003) [2005]

TODD D. GIORGIO, Professor of Biomedical Engineering; Associate Professor of Chemical Engineering
B.S. (Lehigh 1982); Ph.D. (Rice 1986); P.E. [1987]

SAM B. GIRGUS, Professor of English
A.B. (Syracuse 1962); M.A. (Iowa 1963); Ph.D. (New Mexico 1972) [1990]

DARIO A. GIUSE, Associate Professor of Biomedical Informatics
M.S., Ph.D. (Carnegie-Mellon 1993, 1979) [1999]

NUNZIA B. GIUSE, Professor of Biomedical Informatics; Director, Eskind Biomedical Library; Professor of Medicine
M.D. (Brescia [Italy] 1985); M.L.S. (Pittsburgh 1992) [1994]

SUZANNE GLOBETTI, Assistant Professor of Political Science
B.A. (Virginia 1991); Ph.D. (Texas 2002) [2004]

DANIEL FRANK GOCHBERG, Assistant Professor of Radiology and Radiological Sciences; Assistant Professor of Physics
B.S. (Massachusetts Institute of Technology 1991); M.S., Ph.D. (Yale 1994, 1998) [2002]

TERESA A. GODDU, Associate Professor of English; Director, American Studies Program
B.A. (Yale 1986); M.A., Ph.D. (Pennsylvania 1988, 1991) [1991]
JAMES RICHARD GOLDENRING, Paul W. Sanger Professor of Experimental Surgery; Professor of Surgery; Professor of Cell and Developmental Biology
A.B. (Harvard 1980); M.Phil., M.D. (Yale 1984, 1986) [2002]
MICHAEL GOLDFARB, Professor of Mechanical Engineering
B.S. (Arizona 1988); S.M., Ph.D. (Massachusetts Institute of Technology 1992, 1994) [1994]
ELLEN B. GOLDRING, Professor of Educational Policy and Leadership
B.S. (Wisconsin 1978); M.A. (Tel Aviv 1982); Ph.D. (Chicago 1985) [1991]
LEE ANN C. GOLPER, Associate Professor of Hearing and Speech Sciences; Director, Division of Speech-Language Pathology
B.S. (Indiana 1971); M.S. (Portland State 1976); Ph.D. (Oregon 1982) [1999]
STEVEN L. GOODBRED, JR., Assistant Professor of Earth and Environmental Sciences
B.A. (Boston University 1991); M.S. (South Florida 1994); Ph.D. (William and Mar y 1999) [2005]
LENN E. GOODMAN, Andrew W. Mellon Professor of Humanities; Professor of Philosophy
A.B. (Harvard 1965); D.Phil. (Oxford 1968) [1994]
JEFFRY S. GORDON, Professor of Educational Informatics of Nursing, Technology of Nursing; Assistant Professor of Biomedical Informatics
B.S. (Emory 1970); M.Ed., Ph.D. (Illinois 1972, 1976) [2002]
JOHN C. GORE, University Professor of Radiology and Radiological Sciences and Biomedical Engineering; Professor of Molecular Physiology and Biophysics; Professor of Physics; Director, Institute of Imaging Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.Sc. (Manchester 1972); Ph.D. (London 1976); B.A. (Ealing 1983) [2002]
ROY K. GOTTFRIED, Professor of English
B.A., M.A. (Brown 1970, 1970); Ph.D. (Yale 1976) [1975]
SEAN X. GOUDIE, Assistant Professor of English
B.A. (Davidson 1986); M.A. (North Carolina State 1993); Ph.D. (California, Berkeley 1999) [1998]
KATHLEEN L. GOULD, Professor of Cell and Developmental Biology; Investigator, Howard Hughes Institute
A.B. (California, Berkeley 1981); Ph.D. (California, San Diego 1987) [1991]
MATTHEW GOULD, Professor of Mathematics
B.S. (City University of New York, Brooklyn College 1963); M.A., Ph.D. (Pennsylvania State 1965, 1967) [1966]
WILLIAM M. GRADY, Adjoint Assistant Professor of Cancer Biology; Adjunct Assistant Professor of Medicine
B.S., M.D. (Michigan 1987, 1990) [2000]
GEORGE J. GRAHAM, JR., Professor of Political Science
A.B. (Wabash 1960); Ph.D. (Indiana 1965) [1965]
STEPHEN E. GRAHAM, Professor of Special Education; Currey Ingram Chair in Special Education; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S., M.S. (Valdosta State 1972, 1975); Ed.D. (Kansas 1978) [2005]
TODD R. GRAHAM, Professor of Biological Sciences
B.S. (Maryville 1984); Ph.D. (Saint Louis 1988) [1992]
DARYL K. GRANNER, Professor of Molecular Physiology and Biophysics; Joe C. Davis Professor of Biomedical Science; Professor of Medicine; Director, Diabetes Center
B.A., M.D., M.S. (Iowa 1958, 1962, 1962) [1984]
D. WESLEY GRANTHAM, Professor of Hearing and Speech Sciences; Director, Division of Research
Ph.D. (Indiana 1975) [1980]

LAURIE ANN GRECO, Assistant Professor of Pediatrics; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Nevada 1998); M.A., Ph.D. (West Virginia 2000, 2003) [2003]

G. NEIL GREEN, Associate Professor of Microbiology and Immunology
B.S. (Tennessee 1979); Ph.D. (Illinois 1985) [1990]

SENTA VICTORIA GREENE, Professor of Physics
A.B. (Tennessee 1984); M.Phil., M.S., Ph.D. (Yale 1987, 1987, 1993) [1994]

WILLIAM M. GREGG, Assistant Professor of Biomedical Informatics; Instructor in Medicine
B.E.E. (Georgia Institute of Technology 1991); M.D. (Miami [Florida] 1997) [2003]

THOMAS A. GREGOR, Professor of Anthropology
B.A. (Chicago 1962); Ph.D. (Columbia 1969) [1975]

PAUL JAMES GRESCH, Research Instructor in Pharmacology
B.S. (Wisconsin 1984); M.S. (Pittsburgh 1992); Ph.D. (Wayne State 1999) [2004]

CHRISTIAN R. GROSE, Assistant Professor of Political Science
B.A. (Duke 1996); Ph.D. (Rochester 2003) [2005]

GUOQIANG GU, Assistant Professor of Cell and Developmental Biology
B.S. (Ji Lin [China] 1988); M.S. (Chinese Academy of Science 1991); Ph.D. (Columbia 1998) [2002]

SCOTT A. GUELCHER, Assistant Professor of Chemical Engineering
B.S. (Virginia Tech 1992); M.S. (Pittsburgh 1996); Ph.D. (Carnegie-Mellon 1999) [2005]

F. PETER GUENGERICH, Professor of Biochemistry; Director, Center in Molecular Toxicology
B.S. (Illinois 1970); Ph.D. (Vanderbilt 1973) [1975]

DAN GURALNIK, Assistant Professor of Mathematics
B.A., M.Sc., Ph.D. (Technion-Israel Institute of Technology 1994, 1998, 2005) [2006]

VSEVOLOD V. GUREVICH, Associate Professor of Pharmacology
B.S., M.S. (Moscow State 1980); Ph.D. (Shemyakin Institute 1990) [2001]

JAMES W. GUTHRIE, Professor of Public Policy and Education; Director, Peabody Center for Education Policy; Chair, Department of Leadership, Policy, and Organizations
A.B., M.A., Ph.D. (Stanford 1958, 1960, 1968) [1994]

RAUL J. GUZMAN, Assistant Professor of Surgery; Assistant Professor of Cell and Developmental Biology
Sc.B. (Brown 1982); M.D. (Johns Hopkins 1986) [1997]

DAVID L. HACHEY, Professor of Pharmacology; Professor of Biochemistry; Professor of Chemistry
B.A. (Oakland 1967); Ph.D. (California, Santa Barbara 1972) [1998]

KARL E. HACKENBRACK, Associate Professor of Management
B.S. (Davis and Elkins 1979); M.B.A. (Shippensburg 1983); Ph.D. (Ohio State 1988) [2004]

TROY ALAN HACKETT, Assistant Professor of Hearing and Speech Sciences; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A. (Indiana 1987, 1989); Ph.D. (Vanderbilt 1996) [1999]

RICHARD F. HAGLUND, JR., Professor of Physics
B.A. (Wesleyan 1967); M.A. (SUNY, Stony Brook 1968); Ph.D. (North Carolina 1975) [1984]

BARBARA HAHN, Distinguished Professor of German; Professor of German
Staatsexamen für den Höheren Schuldienst (Marburg 1976); Dr.phil (Free University of Berlin 1989); Habilitation (Hamburg 1993) [2004]

MAUREEN KAY HAHN, Research Assistant Professor of Pharmacology
B.A. (Pennsylvania 1987); M.S. (Pittsburgh 1993); Ph.D. (Wayne State 1999) [2002]

JONATHAN LEE HAINES, T. H. Morgan Professor of Human Genetics; Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Director, Center for Human Genetics Research
B.A. (Colby 1979); Ph.D. (Minnesota 1984) [1997]

DENNIS G. HALL, Associate Provost for Research and Graduate Education; Professor of Physics; Professor of Electrical Engineering
B.S. (Illinois 1970); M.S. (Southern Illinois 1972); Ph.D. (Tennessee 1976) [2000]

ROGERS P. HALL, Professor of Mathematics Education
B.A., M.A. (Houston 1976, 1978); M.S., Ph.D. (California, Irvine 1983, 1990) [2002]

DENNIS E. HALLAHAN, Professor of Radiation Oncology and Chair of the Department; Professor of Biomedical Engineering; Ingram Professor of Cancer Biology; Clinical Professor of Radiology at Meharry Medical College
B.S. (Illinois 1980); M.D. (Rush 1984) [1998]

JOHN HALPERIN, Centennial Professor of English
A.B. (Bowdoin 1963); M.A. (New Hampshire 1966); M.A., Ph.D. (Johns Hopkins 1968, 1969) [1983]

AMY HODGES HAMILTON, Assistant Professor of English; Director of Undergraduate Writing
B.A. (Florida State 1997); M.A. (Austin Peay State 1999); Ph.D. (Florida State 2005) [2005]

JOSEPH H. HAMILTON, Landon C. Garland Distinguished Professor of Physics; Director, Joint Institute for Heavy Ion Research
B.S. (Mississippi College 1954); M.S., Ph.D. (Indiana 1956, 1958); D.Sc. (hon., Mississippi College 1982); Dr.Phil.Nat.Hon.Causa (hon., Johann Wolfgang Goethe Universität 1992); Dr.Phil.Nat.Hon.Causa (Bucharest [Romania] 1999); Dr.Phil.Nat.Hon.Causa (St. Petersburg State 2001) [1958]

HEIDI ELIZABETH HAMM, Earl W. Sutherland Jr. Professor of Pharmacology and Chair of the Department; Professor of Ophthalmology and Visual Sciences
B.A. (Atlantic Union 1973); Ph.D. (Texas 1980) [2000]

M. DONALD HANCOCK, Professor of Political Science
B.A. (Texas 1961); M.A., Ph.D. (Columbia 1962, 1966) [1979]

STEVEN K. HANKS, Professor of Cell and Developmental Biology; Associate Professor of Medicine
B.S. (Utah 1977); Ph.D. (Texas Health Science Center, Houston 1982) [1990]

STEPHEN R. HANN, Professor of Cell and Developmental Biology
A.B. (California, Berkeley 1974); Ph.D. (California, Riverside 1981) [1986]

TIMOTHY P. HANUSA, Associate Professor of Chemistry
A.B. (Cornell College 1978); Ph.D. (Indiana 1983) [1985]

DOUGLAS P. HARDIN, Professor of Mathematics; Professor of Biomedical Informatics
B.E.E. (Georgia Institute of Technology 1980); M.E.E. (Stanford 1982); Ph.D. (Georgia Institute of Technology 1985) [1986]

CHRISTOPHER F. J. HARDY, Associate Professor of Cell and Developmental Biology
B.A. (SUNY 1980); Ph.D. (Columbia 1991) [2002]

FRANK E. HARRELL, JR., Professor of Biostatistics and Chair of the Department
B.S. (Alabama 1973); Ph.D. (North Carolina 1979) [2003]

JOEL F. HARRINGTON, Associate Professor of History; Assistant Provost for International Affairs
B.A. (Notre Dame 1981); M.A., Ph.D. (Michigan 1983, 1989) [1989]

KAREN R. HARRIS, Professor of Special Education; Currey Ingram Chair in Special Education; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Northern Colorado 1974); M.A. (Nebraska 1978); Ed.D. (Auburn 1981) [2005]

PAUL A. HARRIS, Research Assistant Professor of Biomedical Engineering
B.S. (Tennessee Technological 1987); M.S., Ph.D. (Vanderbilt 1993, 1996) [1999]

THOMAS R. HARRIS, Orrin H. Ingram Distinguished Professor of Engineering; Professor of Biomedical Engineering and Chair of the Department; Professor of Chemical Engineering; Professor of Medicine
B.S., M.S. (Texas A & M 1958, 1962); Ph.D. (Tulane 1964); M.D. (Vanderbilt 1974) [1964]

VICKI S. HARRIS, Assistant Clinical Professor of Psychology, Peabody College; Assistant Clinical Professor of Psychiatry; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Fellow, Institute for Public Policy Studies
B.S. (SUNY, Cortland 1984); M.S., Ph.D. (Pennsylvania State 1987, 1991) [1993]

EVA HARTH, Assistant Professor of Chemistry
Bachelor (Friedrich-Wilhelms-Universität [Bonn] 1990); B.S., M.S. (Zurich 1994); Ph.D. (Mainz [Germany] 1998) [2004]

FREDERICK R. HASELTON, Professor of Biomedical Engineering
A.B. (Haverford 1969); Ph.D. (Pennsylvania 1981) [1989]

ALYSSA H. HASTY, Assistant Professor of Molecular Physiology and Biophysics
B.S. (Tennessee Technological 1994); Ph.D. (Vanderbilt 1998) [2001]

JACEK HAWIGER, Oswald T. Avery Distinguished Professor of Microbiology and Immunology and Chair of the Department
M.D. (Copernicus School of Medicine 1962); Ph.D. (National Institute of Hygiene [Warsaw] 1967); M.A. (hon., Harvard 1987); M.D. (hon., Copernicus School of Medicine 1992) [1990]

DAVID S. HAYNES, Associate Professor of Otolaryngology; Associate Professor of Hearing and Speech Sciences
A.B. (Tennessee 1983); M.D. (Tennessee, Memphis 1987) [1995]

SIMON WILLIAM HAYWARD, Associate Professor of Urologic Surgery; Assistant Professor of Cancer Biology
B.Sc., M.Sc., Ph.D. (London 1981, 1984, 1991) [2001]

DAVID R. HEAD, Professor of Pathology and Vice Chair for Clinical Affairs
B.A. (Rice 1964); M.D. (Texas 1968) [2000]

ANNABETH HEADRICK, Assistant Professor of Art History
B.A. (Colorado College 1985); M.A., Ph.D. (Texas 1991, 1996) [1997]

JAMES C. HEARN, Professor of Public Policy and Higher Education
A.B. (Duke 1968); M.B.A. (Pennsylvania 1970); M.A., Ph.D (Stanford 1976, 1978) [2002]

CRAIG ANNE HEFLINGER, Associate Professor of Human and Organizational Development; Senior Fellow, Institute for Public Policy Studies; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Vanderbilt 1973); M.A. (Peabody 1975); Ph.D. (Vanderbilt 1989) [1989]

CARL G. HELLERQVIST, Professor of Biochemistry; Associate Professor of Medicine
fil. dr. docent (Stockholm 1971) [1974]

MARY LOUISE HEMMETER, Associate Professor of Special Education
B.S. (Auburn 1984); M.Ed., Ph.D. (Vanderbilt 1987, 1991) [2005]

DAVID M. HERCULES, Centennial Professor of Chemistry
B.S. (Juniata 1954); Ph.D. (Massachusetts Institute of Technology 1957) [1994]

ALAN JOSEPH HERLINE, Assistant Professor of Surgery; Assistant Professor of Biomedical Engineering
B.E. (Vanderbilt 1987); M.D. (Medical College of Georgia 1994) [2002]

JONI HERSCH, Professor of Law; Professor of Economics
B.A. (South Florida 1977); Ph.D. (Northwestern 1981) [2006]

TOBIAS HERTEL, Associate Professor of Physics
B.S., Ph.D. (Free University [Germany] 1992, 1995) [2003]

B. ANDES HESS, JR., Professor of Chemistry
B.A. (Williams 1962); M.S., Ph.D. (Yale 1963, 1966) [1968]

MARC J. HETHERINGTON, Associate Professor of Political Science
B.A. (Pittsburgh 1990); Ph.D. (Texas 1997) [2004]

STEPHEN P. HEYNEMAN, Professor of International Educational Policy
B.A. (California, Berkeley 1964); M.A. (California, Los Angeles 1965); M.A., Ph.D. (Chicago 1973, 1975) [2000]

GERALD B. HICKSON, Professor of Pediatrics; Associate Dean for Clinical Affairs and Director of the Vanderbilt Center for Patient and Professional Advocacy; Clinical Professor of Nursing; Associate Professor of Hearing and Speech Sciences; Professor of Psychiatry; Professor of Medical and Education Administration; Senior Fellow, Institute for Public Policy Studies
B.S. (Georgia 1973); M.D. (Tulane 1978) [1982]

SCOTT W. HIEBERT, Professor of Biochemistry; Associate Professor of Medicine
B.S. (Bethel 1982); Ph.D. (Northwestern 1987) [1997]

GEORGE C. HILL, Levi Watkins Jr. Professor and Associate Dean for Diversity in Medical Education, School of Medicine; Professor of Medical and Education Administration; Professor of Microbiology and Immunology
B.A. (Rutgers 1961); M.S. (Howard 1963); Ph.D. (New York 1967) [2002]

JONATHAN T. HISKEY, Associate Professor of Political Science
B.A. (North Carolina 1989); M.A. (Florida International 1993); M.A., Ph.D. (Pittsburgh 1995, 1999) [2005]

ROBERT HODAPP, Professor of Special Education; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Co-Director, Research Program on Families
B.A. (Columbia 1977); M.A., Ph.D. (Boston University 1981, 1983) [2003]

MICHAEL P. HODGES, Professor of Philosophy and Chair of the Department
B.A. (William and Mary 1963); M.A., Ph.D. (Virginia 1966, 1967) [1970]

DONNA L. HOFFMAN, Professor of Management (Marketing)
A.B. (California, Davis 1978); M.A., Ph.D. (North Carolina 1980, 1984) [1993]

CLIFFORD A. HOFWOLT, Associate Professor of Science Education
B.A., M.A. (Colorado State College 1964, 1968); Ed.D. (Northern Colorado 1971) [1972]

JAMES H. HOGGE, Associate Dean for Faculty and Programs, Peabody College; Professor of Psychology, Peabody College
B.A., Ph.D. (Texas 1964, 1966) [1967]

STEVEN D. HOLLON, Professor of Psychology, College of Arts and Science; Professor of Psychology, Peabody College; Associate Professor of Psychiatry; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (George Washington 1971); M.S., Ph.D. (Florida State 1974, 1977) [1985]

W. TIMOTHY HOLMAN, Research Associate Professor of Electrical Engineering
B.S. (Tennessee 1986); M.S., Ph.D. (Georgia Institute of Technology 1988, 1994) [2000]

HANS-WILLI HONEGGER, Research Professor of Biological Sciences
Dr.rer.nat (Eberhard-Karls-Universität Tübingen 1967) [1995]

WILLIAM J. HOOK, Assistant Professor of Theological Bibliography; Director, Divinity Library
B.Sc. (Florida Institute of Technology 1974); M.Div. (Emory 1977); M.A., Ph.D. (Vanderbilt 1985, 1992) [1983]

RICHARD L. HOOVER, Professor of Pathology; Associate Professor of Pediatrics; Associate Dean of the Graduate School
B.A. (Ohio State 1966); M.S. (Kentucky 1969); Ph.D. (Michigan State 1972) [1985]

KATHLEEN V. HOOVER-DEMPSEY, Associate Professor of Psychology, Peabody College, and Chair of the Department of Psychology and Human Development; Associate Professor of Education
A.B. (California, Berkeley 1964); M.A., Ph.D. (Michigan State 1969, 1974) [1973]

MARY ANN HORN, Associate Professor of Mathematics
B.S. (Pennsylvania State 1987); M.S., Ph.D. (Virginia 1989, 1992) [1994]

GREGG M. HOROWITZ, Associate Professor of Philosophy
B.A. (Sarah Lawrence 1980); A.M. (Boston University 1983); Ph.D. (Rutgers 1992) [1993]
MARK HOSFORD, Assistant Professor of Art
B.F.A. (Kansas 1998); M.F.A. (Tennessee 2001) [2001]
KEVIN X. D. HUANG, Associate Professor of Economics
Ph.D. (Minnesota 1998) [2006]
JAMES HUDNUT-BEUMLER, Dean of the Divinity School; Anne Potter Wilson Distinguished Professor of American Religious History
B.A. (Wooster 1980); M.Div. (Union Theological Seminary 1983); M.A., Ph.D. (Princeton 1989, 1989) [2000]
BILLY GERALD HUDSON, Elliot V. Newman Professor of Medicine; Professor of Biochemistry; Director, Matrix Biology Center
B.S. (Henderson State Teachers 1962); M.S. (Tennessee 1963); Ph.D. (Iowa 1966) [2002]
GREGORY W. HUFFMAN, Professor of Economics
Bachelor of Commerce (Saskatchewan 1979); Ph.D. (Minnesota 1983) [2001]
C. BRUCE HUGHES, Professor of Mathematics
A.B. (Guilford 1976); M.A., Ph.D. (Kentucky 1979, 1981) [1985]
CAROLYN HUGHES, Professor of Special Education; Member, Vanderbilt Kennedy Center for Research on Human Development
A.B. (California, Berkeley 1969); M.S. (Eastern Montana 1985); Ph.D. (Illinois 1990) [1991]
CATHERINE A. HUMPHREY, Instructor in Orthopaedics and Rehabilitation
B.A. (Stanford 1994); M.D. (MCP Hahnemann 2001) [2006]
ALICE WELLS HUNT, Associate Dean for Academic Affairs, Divinity School; Assistant Professor of Hebrew Bible and Jewish Studies
B.S. (Montevallo 1978); M.T.S., M.A., Ph.D. (Vanderbilt 1996, 2001, 2003) [2001]
ERIC J. HUSTEDT, Research Assistant Professor of Molecular Physiology and Biophysics
B.A. (Reed 1981); Ph.D. (University of Washington 1989) [1995]
M. SHANE HUTSON, Assistant Professor of Physics; Assistant Professor of Biological Sciences
B.A., M.S. (Wake Forest 1992, 1993); Ph.D. (Virginia 2000) [2003]
NANCY LEA HYER, Associate Professor of Management (Operations)
B.A. (Richmond 1977); M.B.A., Ph.D. (Indiana 1981, 1982) [1992]
SUSAN E. HYLEN, Mellon Assistant Professor of Religious Studies
B.A. (California, San Diego 1990); M.Div. (Princeton Theological Seminary 1995); Ph.D. (Emory 2004) [2005]
YOSHIKUNI IGARASHI, Associate Professor of History; Director, East Asian Studies Program
B.A. (International Christian University [Tokyo] 1985); M.A. (California, Berkeley 1989); Ph.D. (Chicago 1993) [1993]
TOSHIAKI IIZUKA, Assistant Professor of Management (Economics/Strategy)
B.E., M.E. (Tokyo 1987, 1989); Master of International Affairs (Columbia 1996); Ph.D. (California, Los Angeles 2001) [2001]
TADASHI INAGAMI, Stanford Moore Professor of Biochemistry; Professor of Medicine; Director, Specialized Center of Research in Hypertension
B.S. (Kyoto 1953); M.S., Ph.D. (Yale 1955, 1958); D.Sc. (Kyoto 1963) [1966]
ROBERT B. INNES, Associate Professor of Psychology, Peabody College; Director, Program in Human and Organizational Development
B.A., M.A. (Michigan State 1963, 1965); Ph.D. (Michigan 1971) [1971]
LARRY W. ISAAC, Professor of Sociology
B.S., M.A. (Akron 1971, 1974); Ph.D. (Indiana 1979) [2004]

LINDA N. ISAACS, Lecturer in Human and Organizational Development
J.D. (Nashville School of Law 1984); M.Ed., Ed.D. (Vanderbilt 1996, 2003) [2003]
DAVID J. JAMES, Research Assistant Professor of Astronomy
B.S. (London 1992); Ph.D. (Birmingham [England] 1998) [2004]
CHRISTOPHER J. JANETOPOULOS, Assistant Professor of Biological Sciences
B.A. (Augustana 1990); Ph.D. (Texas A & M 1999) [2005]
E. DUCO JANSEN, Associate Professor of Biomedical Engineering; Associate Professor of Neurological Surgery
Drs. (M.Sc.) (Utrecht 1990); M.S., Ph.D. (Texas 1992, 1994) [1997]
JOHN WAYNE JANUSEK, Associate Professor of Anthropology
B.A., M.A. (Illinois, Chicago 1986, 1987); Ph.D. (Chicago 1994) [1998]
MARK JARMAN, Professor of English; Director, Creative Writing Program
A.B. (California, Santa Cruz 1974); M.F.A. (Iowa 1976) [1983]
CARLOS JÁUREGUI, Assistant Professor of Spanish; Assistant Professor of Anthropology
Licenciado en Leyes (Universidad Externado de Colombia 1993); M.A. (West Virginia 1997); Ph.D. (Pittsburgh 2001) [2001]
G. KANE JENNINGS, Associate Professor of Chemical Engineering
B.S. (Auburn 1993); M.S., Ph.D. (Massachusetts Institute of Technology 1996, 1998) [1998]
GARY F. JENSEN, Professor of Sociology and Chair of the Department; Professor of Religious Studies
B.S. (Portland State 1966); M.A., Ph.D. (University of Washington 1968, 1972) [1989]
ROBIN M. JENSEN, Luce Chancellor's Professor of the History of Christian Worship and Art
B.A. (Concordia 1973); M.A., M.Phil., Ph.D. (Union Theological Seminary [New York] 1977, 1986, 1991) [2003]
WALTER GRAY JEROME III, Associate Professor of Pathology; Associate Professor of Cancer Biology
B.A. (St. Andrews 1971); Ph.D. (Virginia 1981) [2001]
JASON R. JESSEN, Assistant Professor of Medicine; Assistant Professor of Cancer Biology
B.A. (Augustana 1992); M.S. (South Dakota State 1995); Ph.D. (Medical College of Georgia 1999) [2006]
DEBRA C. JETER, Associate Professor of Management (Accounting)
B.S., M.B.A. (Murray State 1975, 1981); Ph.D. (Vanderbilt 1990) [1994]
ROBERT JIMENEZ, Professor of Language, Literacy, and Culture
B.A. (University of the Americas [Mexico] 1978); M.Ed., Ph.D. (Illinois 1986, 1992) [2004]
CHRISTOPHER M. S. JOHNS, Norman L. and Roselea J. Goldberg Professor of Art History; Professor of Art History; Chair, Department of History of Art
B.A. (Florida State 1977); M.A., Ph.D. (Delaware 1980, 1985) [2003]
WILL E. JOHNS, Associate Professor of Physics
B.S. (Illinois 1987); Ph.D. (Colorado 1995) [1999]
CARL H. JOHNSON, Professor of Biological Sciences; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Texas 1976); Ph.D. (Stanford 1982) [1987]
DALE A. JOHNSON, Drucilla Moore Buffington Professor of Church History
B.A. (Colgate 1957); B.A. (Oxford 1959); B.D. (Lutheran School of Theology at Chicago 1962); M.A. (Oxford 1963); Th.D. (Union Theological Seminary [New York] 1967) [1969]
JOYCE E. JOHNSON, Associate Professor of Pathology
B.A. (Rice 1979); M.D. (Vanderbilt 1986) [1992]
KEVIN B. JOHNSON, Associate Professor of Biomedical Informatics and Vice Chair of the Department; Associate Professor of Pediatrics
B.S. (Dickinson 1983); M.D. (Johns Hopkins 1987); M.S. (Stanford 1992) [2002]

ROLANDA JOHNSON, Assistant Professor of Nursing
B.S.N. (Tuskegee Institute 1985); M.S.N. (Troy State 1989); Ph.D. (Vanderbilt 1998); R.N. [1998]

JEFFREY N. JOHNSTON, Professor of Chemistry
B.S. (Xavier 1992); Ph.D. (Ohio State 1997) [2006]

OWEN D. JONES, Professor of Law; Professor of Biological Sciences
B.A. (Amherst 1985); J.D. (Yale 1991) [2003]

SEBASTIAN JOYCE, Professor of Microbiology and Immunology
B.Sc. (Bangalore [India] 1971); M.Sc. (Saurashtra [India] 1981); Ph.D. (Medical College of Virginia 1988) [1999]

CATHY LOGIN JRADE, Professor of Spanish and Chair of the Depar tment of Spanish and Portuguese
B.A. (City University of New York, Queens 1969); A.M., Ph.D. (Brown 1971, 1974) [1987]

JON H. KAAS, Distinguished Professor of Psychology, College of Arts and Science; Professor of Cell and Developmental Biology; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Northland 1959); Ph.D. (Duke 1965) [1972]

ANN P. KAISER, Professor of Special Education; Professor of Psychology, Peabody College; Director, Research Program on Families, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Kansas State 1970); M.A., Ph.D. (Kansas 1973, 1974) [1982]

SPYROS A. KALAMS, Associate Professor of Medicine; Assistant Professor of Microbiology and Immunology
B.A. (Harvard 1983); M.D. (Connecticut 1987) [2002]

WENG POO KANG, Professor of Electrical Engineering; Professor of Computer Engineering; Professor of Materials Science and Engineering
B.S. (Texas 1981); M.S., Ph.D. (Rutgers 1983, 1988) [1988]

DANIEL L. KAPLAN, Assistant Professor of Biological Sciences
B.A. (Virginia 1998); Ph.D. (Yale 2000) [2005]

CHRISTINA KARAGEORGOU-BASTEA, Assistant Professor of Spanish
B.A. (Athens 1988); M.A. (Universidad Veracruzana 1994); M.A., Ph.D. (El Colegio de México 1996, 1998) [2002]

GÁBOR KARSAI, Associate Professor of Electrical Engineering; Associate Professor of Computer Engineering
B.E.E., M.E.E., University Doctorate (Technical University of Budapest 1982, 1984, 1988); Ph.D. (Vanderbilt 1988) [1990]

JAYA N. KASIBHATLA, Assistant Professor of English
B.A. (Yale 1998); Ph.D. (Duke 2005) [2005]

SUSAN KASPER, Assistant Professor of Urologic Surgery; Assistant Professor of Cancer Biology
B.Sc., M.Sc., Ph.D. (Manitoba 1978, 1981, 1984) [1996]

PIOTR KASZYNSKI, Associate Professor of Chemistry
M.Sc. (Technical University of Warsaw 1985); Ph.D. (Texas 1991) [1993]

KAZUHIKO KAWAMURA, Professor of Electrical Engineering; Professor of Computer Engineering; Professor of Management of Technology; Director, Center for Intelligent Systems
B.E. (Waseda 1963); M.S. (California, Berkeley 1966); Ph.D. (Michigan 1972) [1981]

DIANE S. KEENEY, Assistant Professor of Medicine; Assistant Professor of Biochemistry
B.S. (Pennsylvania State 1978); M.S. (Iowa State 1983); Ph.D. (Johns Hopkins 1989) [1992]

SHAUL KELNER, Assistant Professor of Sociology and Jewish Studies
B.A. (George Washington 1992); M.Phil., Ph.D. (City University of New York 2000, 2002) [2005]

CRAIG HALL KENNEDY, Professor of Special Education; Associate Professor of Pediatrics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (California, Santa Barbara 1987); M.S. (Oregon 1988); Ph.D. (California, Santa Barbara 1992) [1997]

ANNE K. KENWORTHY, Assistant Professor of Molecular Physiology and Biophysics; Assistant Professor of Cell and Developmental Biology
B.A. (Kenyon 1989); Ph.D. (Duke 1994) [2001]

THOMAS W. KEPHART, Associate Professor of Physics
B.S. (Virginia Polytechnic 1971); M.S. (North Texas State 1975); Ph.D. (Northeastern 1981) [1985]

ALEXANDRA FONARYOVA KEY, Research Assistant Professor of Hearing and Speech Sciences; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A. (Moscow State 1997, 1997); Ph.D. (Louisville 2002) [2004]

DENNIS DEAN KEZAR, JR., Associate Professor of English
B.A. (University of the South 1990); M.A., Ph.D. (Virginia 1993, 1997) [1997]

DINEO KHABELE, Assistant Professor of Obstetrics and Gynecology at Meharry Medical College; Assistant Professor of Cancer Biology at Vanderbilt; Clinical Instructor in Obstetrics and Gynecology
B.A., M.D. (Columbia 1989, 1994) [2005]

WASIF NOOR KHAN, Assistant Professor of Microbiology and Immunology
B.S., M.S. (Karachi, Pakistan 1978, 1980); Ph.D. (Stockholm and Umeå [Sweden] 1990) [1997]

RICHARD B. KIM, Professor of Medicine; Professor of Pharmacology
M.D. (Saskatchewan 1987) [1994]

YOUB KIM, Assistant Professor of Language, Literacy, and Culture
B.S. (Yonsei 1984); M.A., Ph.D. (Michigan State 1996, 2004) [2003]

JOAN E. KING, Associate Professor of Nursing
B.S.N., M.S.N. (Vanderbilt 1972, 1975); Ph.D. (Peabody 1984); R.N., A.N.P. [1975]

RICHARD KING, Associate Professor of Religious Studies; Associate Professor of Religion and Culture
B.A. (Hull [United Kingdom] 1987); Ph.D. (Lancaster [United Kingdom] 1992) [2005]

DONALD L. KINSER, Professor of Mechanical Engineering, Emeritus; Professor of Materials Science and Engineering, Emeritus
B.S., Ph.D. (Florida 1964, 1968); P.E. [1968]

HOWARD S. KIRSHNER, Professor of Neurology and Vice Chair of the Department; Director, Division of Stroke; Professor of Speech (Language Pathology); Professor of Psychiatry; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Williams 1968); M.D. (Harvard 1972) [1978]

DOUGLAS A. KNIGHT, Professor of Hebrew Bible
B.A. (Ottawa [Kansas] 1965); M.Div. (California Baptist Theological Seminary 1968); Dr.theol. (Georg-August-Universität Göttingen 1973) [1973]

ROBERT A. KNOP, JR., Assistant Professor of Physics and Astronomy
B.S. (Harvey Mudd 1990); M.S., Ph.D. (California Institute of Technology 1992, 1997) [2001]

TAKKUEN JOHN KOO, Assistant Professor of Computer Engineering
B.Eng., M.Phil. (Chinese University of Hong Kong 1992, 1994); Ph.D. (California, Berkeley 2000) [2003]

NAOHIKO KOSHIKAWA, Adjunct Assistant Professor of Cancer Biology
B.Sc., M.Sc., Ph.D. (Yokohama City 1990, 1992, 1995) [2003]

DAVID S. KOSSON, Professor of Civil and Environmental Engineering and Chair of the Department; Professor of Chemical Engineering; Professor of Earth and Environmental Sciences
B.S., M.S., Ph.D. (Rutgers 1983, 1984, 1986) [2000]

XENOFON D. KOUTSOUKOS, Assistant Professor of Computer Science
Diploma (National Technical University of Athens 1993); M.S. in Applied Mathematics, M.S. in Electrical Engineering, Ph.D. (Notre Dame 1998, 1998, 2000) [2002]

MICHAEL KREYLING, Professor of English
B.A. (Thomas More 1970); M.A., Ph.D. (Cornell 1974, 1975) [1985]

ANDRZEJ M. KREZEL, Assistant Professor of Biological Sciences
M.Sc. (Warsaw 1986); Ph.D. (Wisconsin 1991) [1996]

TSUTOMU KUME, Assistant Professor of Medicine; Assistant Professor of Cell and Developmental Biology
B.A., M.A., Ph.D. (Tokyo 1991, 1993, 1996) [2000]

SABINA KUPERSHMIDT, Assistant Professor of Anesthesiology; Assistant Professor of Pharmacology
B.S. (Middle Tennessee State 1984); Ph.D. (Vanderbilt 1990) [1998]

MUMIN KURTULUS, Instructor in Management
B.S. (Koc [Turkey] 1998); M.S. (Bilkent [Turkey] 2000); M.S., Ph.D. (INSEAD [France] 2002, 2005) [2005]

KONSTANTIN V. KUSTANOVICH, Associate Professor of Slavic Languages and Literatures
Engineering Diploma (Leningrad Polytechnical Institute 1969); M.A. (New York 1977); M.Phil., Ph.D. (Columbia 1983, 1986) [1987]

VERA M. KUTZINSKI, Martha Rivers Ingram Professor of English; Professor of English; Director, Center for the Americas
Diploma (Smith 1979); M.A., M.A., Ph.D. (Yale 1981, 1982, 1985) [2004]

JOHN LACHS, Centennial Professor of Philosophy; Senior Fellow, Institute for Public Policy Studies
B.A., M.A. (McGill 1956, 1957); Ph.D. (Yale 1961) [1967]

BONNIE LAFLEUR, Assistant Professor of Biostatistics
B.A. (California, Berkeley 1990); M.P.H. (San DIego State 1995); Ph.D. (Colorado 1999) [2001]

JONATHAN LAMB, Andrew W. Mellon Professor in the Humanities; Professor of English
B.A., D.Phil. (York [Canada] 1966, 1971) [2002]

LYNDA L. LAMONTAGNE, Professor of Nursing
B.S. (California State, Los Angeles 1970); M.S., D.N.S. (California, San Francisco 1972, 1982); R.N. [1989]

LAURENCE E. LANCASTER, Professor of Nursing
B.S.N. (Evansville 1970); M.S.N., Ed.D. (Vanderbilt 1971, 1982); R.N., A.C.N.P. [1973]

JANE GILMER LANDERS, Associate Professor of History
A.B., M.A. (Miami [Florida] 1968, 1974); Ph.D. (Florida 1988) [1992]

KATHLEEN LYNNE LANE, Assistant Professor of Special Education; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A., Ph.D. (California, Riverside 1988, 1992, 1997) [2001]

JAMES J. LANG, Associate Professor of Sociology
B.A. (Canisius 1966); M.A., Ph.D. (Michigan 1969, 1974) [1974]

JOSEPH S. LAPPIN, Professor of Psychology, College of Arts and Science, Emeritus; Research Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Cincinnati 1962); Ph.D. (Illinois 1966) [1968]

MICHAEL A. LAPRÉ, Assistant Professor of Management (Operations Management)
Doctorandus (Erasmus University [Rotterdam] 1991); Ph.D. (Institut européen d'Administration des Affaires [France] 1997) [2001]

JANA L. LAUDERDALE, Associate Professor of Nursing
B.S., M.S. (Texas Woman's 1975, 1978); Ph.D. (Utah 1992); R.N. [2004]

ALEXANDER R. LAWTON III, Edward Claiborne Stahlman Professor of Pediatric Physiology and Cell Metabolism; Professor of Pediatrics; Professor of Microbiology and Immunology; Director, Division of Pediatric Immunology
B.A. (Yale 1960); M.D. (Vanderbilt 1964) [1980]

KEVIN M. LEANDER, Associate Professor of Language and Literacy
B.A. (Colorado, Boulder 1985); M.A., Ph.D. (Illinois 1995, 1999) [1999]

LARRY J. LEBLANC, Professor of Management (Operations Management)
B.S. (Loyola [Louisiana] 1969); M.S., Ph.D. (Northwestern 1971, 1973) [1980]

EUGENE J. LEBOEUF, Associate Professor of Civil and Environmental Engineering
B.S. (Rose-Hulman Institute of Technology 1985); M.S. (Northwestern 1986); M.S. (Stanford 1993); Ph.D. (Michigan 1998); P.E. [1997]

AKOS LEDECZI, Research Assistant Professor of Electrical Engineering
Diploma (Technical University of Budapest 1989); Ph.D. (Vanderbilt 1995) [1996]

ETHAN LEE, Assistant Professor of Cell and Developmental Biology
B.A. (Rice 1987); M.D., Ph.D. (Texas, Southwestern 1997, 1997) [2003]

LAURA ANNE LEE, Assistant Professor of Cell and Developmental Biology
B.A. (Rice 1987); M.D., Ph.D. (Texas, Southwestern 1996, 1996) [2003]

RICHARD LEHRER, Professor of Science Education
B.S. (Rensselaer Polytechnic Institute 1973); M.S., Ph.D. (SUNY, Albany 1976, 1983) [2002]

JENNIFER C. LENA, Assistant Professor of Sociology
A.B. (Colgate 1996); M.A., M.Phil. (Columbia 1999, 1999) [2003]

JOE P. LESTER, Instructor in Clinical Anesthesiology
B.S. (Citadel 1991); M.S. (Georgia 1994); D.O. (University of Health Sciences College of Osteopathic Medicine 2002) [2006]

WALLACE M. LESTOURGEON, Professor of Biological Sciences
B.S., Ph.D. (Texas 1966, 1970) [1974]

M. DOUGLAS LEVAN, J. Lawrence Wilson Professor of Engineering; Professor of Chemical Engineering and Chair of the Department
B.S. (Virginia 1971); Ph.D. (California, Berkeley 1976) [1997]

DANIEL T. LEVIN, Associate Professor of Psychology, Peabody College
B.A. (Reed 1989); Ph.D. (Cornell 1997) [2003]

AMY-JILL LEVINE, Carpenter Professor of New Testament Studies; Director, Carpenter Program in Religion, Gender, and Sexuality
A.B. (Smith 1978); A.M., Ph.D. (Duke 1981, 1984) [1994]

PAT R. LEVITT, Professor of Pharmacology; Director, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Chicago 1975); Ph.D. (California, Berkeley 1978) [2002]

SHAWN E. LEVY, Assistant Professor of Biomedical Informatics; Assistant Professor of Molecular Physiology and Biophysics; Director, DNA Microarray Shared Resource
B.S. (New Hampshire 1994); Ph.D. (Emory 2000) [2000]

CRAIG M. LEWIS, Professor of Management (Finance)
B.S. (Ohio State 1978); M.S., Ph.D. (Wisconsin 1982, 1986); C.P.A. [1986]

CHUN LI, Assistant Professor of Biostatistics
B.A. (Nankai [China] 1992); M.S. (Ohio State 1998); Ph.D. (Michigan 2002) [2002]

DEYU LI, Assistant Professor of Mechanical Engineering
B.E. (University of Science and Technology of China 1992); M.E. (Tsinghua [China] 1997); Ph.D. (California, Berkeley 2003) [2004]

DONGQING LI, Professor of Mechanical Engineering; H. Fort Flowers Professor of Mechanical Engineering
B.A.Sc. (Zhejiang [China] 1982); M.Sc. (Dalian Maritime [China] 1984); Ph.D. (Toronto 1991) [2005]

TONG LI, Professor of Economics
B.S. (University of Science and Technology [China] 1988); Ph.D. (California, San Diego 1993); Ph.D. (Southern California 1997) [2005]
PENG LIANG, Associate Professor of Cancer Biology
B.S. (Beijing 1982); Ph.D. (Illinois 1990) [1995]
DANIEL CHRISTOPHER LIEBLER, Professor of Biochemistry; Professor of Pharmacology; Director, Center in Proteomics
B.S. (Villanova 1980); Ph.D. (Vanderbilt 1984) [2003]
PAUL C. H. LIM, Assistant Professor of Historical Studies in Religion
B.A. (Yale 1990); M.Div. (Biblical Theological Seminary 1995); Th.M. (Princeton 1997); Ph.D. (Cambridge 2001) [2006]
LEE E. LIMBIRD, Adjunct Professor of Pharmacology
B.A. (Wooster 1970); Ph.D. (North Carolina 1973) [1979]
ANGELA H. LIN, Assistant Professor of German
B.A. (Pennsylvania 1991); Ph.D. (Princeton 1999) [2000]
P. CHARLES LIN, Associate Professor of Radiation Oncology; Assistant Professor of Cell and Developmental Biology; Associate Professor of Cancer Biology
B.S. (Beijing Normal [China] 1983); Ph.D. (Peking Union Medical College 1988) [1999]
STEFANIE A. LINDQUIST, Associate Professor of Political Science; Associate Professor of Law
B.A. (Ursinus 1985); J.D. (Temple 1988); Ph.D. (South Carolina 1996) [2004]
ANDREW J. LINK, Assistant Professor of Microbiology and Immunology; Ingram Assistant Professor of Cancer Research; Assistant Professor of Biochemistry; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., B.S., M.A. (Washington University 1987); Ph.D. (Harvard 1994) [1999]
MACRAE F. LINTON, Professor of Medicine; Professor of Pharmacology
B.S. (Tulane 1978); M.D. (Tennessee 1985) [1993]
MARK W. LIPSEY, Director, Center for Evaluation Research and Methodology, Institute for Public Policy Studies; Senior Research Associate, Institute for Public Policy Studies
B.S. (Georgia Institute of Technology 1968); Ph.D. (Johns Hopkins 1972) [1992]
RICHARD DOUGLAS LLOYD, Assistant Professor of Sociology
B.A. (California, Berkeley 1991); M.A., Ph.D. (Chicago 1995, 2002) [2003]
GORDON DENNIS LOGAN, Centennial Professor of Psychology, College of Arts and Science
B.A., M.Sc. (Alberta 1969, 1972); Ph.D. (McGill 1975) [2000]
LORRAINE M. LOPEZ, Assistant Professor of English
B.A. (California State 1989); M.A., Ph.D. (Georgia 1997, 2000) [2002]
RENE LOPEZ, Research Assistant Professor of Physics
B.S. (Monterrey Institute of Technology and Advanced Studies [Mexico] 1996); M.S., Ph.D. (Vanderbilt 2000, 2002) [2005]
NANCY M. LORENZI, Assistant Vice Chancellor for Health Affairs; Professor of Biomedical Informatics; Clinical Professor of Nursing
A.B. (Youngstown State 1966); M.S. (Case Western Reserve 1968); M.A. (Louisville 1975); Ph.D. (Cincinnati 1980) [2000]
DAVID A. LOWE, Associate Professor of Slavic Languages and Literatures
B.A. (Macalester 1969); A.M., Ph.D. (Indiana 1972, 1977) [1979]
DAVID LUBINSKI, Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., Ph.D. (Minnesota 1981, 1987) [1998]
WILLIAM LUIS, Professor of Spanish
B.A. (SUNY, Binghamton 1971); M.A. (Wisconsin 1973); M.A., Ph.D. (Cornell 1979, 1980) [1991]

CHARLES M. LUKEHART, Professor of Chemistry
B.S. (Pennsylvania State 1968); Ph.D. (Massachusetts Institute of Technology 1972) [1973]

ELIZABETH LUNBECK, Nelson Tyrone Jr. Professor of American History; Professor of History
B.A. (Duke 1975); Ph.D. (Harvard 1984) [2006]

LARS LUND, Visiting Scholar in Medicine
M.D. (Aarhus [Denmark] 1984) [2006]

MELANIE LUTENBACHER, Associate Professor of Nursing; Associate Professor of Pediatrics; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S.N. (Texas 1974); M.S.N. (California State 1986); Ph.D. (Kentucky 1994); R.N.–C.S., F.N.P., P.N.P. [1993]

TERRY P. LYBRAND, Professor of Chemistry; Professor of Pharmacology
B.S. (South Carolina 1980); Ph.D. (California, Berkeley 1984) [2000]

ROBERT L. MACDONALD, Professor of Neurology and Chair of the Department; Professor of Pharmacology; Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
S.B. (Massachusetts Institute of Technology 1966); Ph.D., M.D. (Virginia 1969, 1973) [2001]

MARK A. MAGNUSON, Earl W. Sutherland, Jr. Professor of Molecular Physiology and Biophysics; Professor of Medicine;
B.A. (Luther 1975); M.D. (Iowa 1979) [1985]

CHARLES F. MAGUIRE, Professor of Physics
B.S. (Iona 1966); Ph.D. (Yale 1973) [1975]

SANKARAN MAHADEVAN, Professor of Civil and Environmental Engineering; Professor of Mechanical Engineering
B.Tech. (Indian Institute of Technology 1982); M.S. (Rensselaer Polytechnic Institute 1985); Ph.D. (Georgia Institute of Technology 1988) [1988]

ANITA MAHADEVAN-JANSEN, Associate Professor of Biomedical Engineering; Assistant Professor of Neurological Surgery
B.Sc., M.Sc. (Bombay 1988, 1990); M.S., Ph.D. (Texas 1993, 1996) [1997]

BRAD E. MALTZ, Instructor in Medicine
B.S. (Florida Atlantic 1998); M.D. (University of Miami School of Medicine 2003) [2006]

ANDREA MANESCHI, Professor of Economics; Director, Graduate Program in Economic Development
B.A. (Oxford 1958); Ph.D. (Johns Hopkins 1964) [1969]

HERBERT R. MARBURY, Assistant Professor of Hebrew Bible
B.A. (Emory 1991); M.Div. (Interdenominational Theological Center 1994); M.A., Ph.D. (Vanderbilt 1999, 2003) [2006]

SALVATORE T. MARCH, David K. Wilson Professor of Management (Information Technology)
B.S., M.S., Ph.D. (Cornell 1972, 1975, 1978) [2000]

LEAH S. MARCUS, Edwin Mims Professor of English; Acting Chair of the Department
B.A. (Carleton 1967); M.A., Ph.D. (Columbia 1968, 1971) [1998]

LAWRENCE J. MARNETT, Mary Geddes Stahlman Professor of Cancer Research; Professor of Biochemistry; Professor of Chemistry; Director, Vanderbilt Institute of Chemical Biology
B.S. (Rockhurst 1969); Ph.D. (Duke 1973) [1989]

RENÉ MAROIS, Associate Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.Sc. (McGill 1986); M.Sc. (Dalhousie 1989); Ph.D. (Yale 1996) [1999]

LLOYD W. MASSENGILL, Professor of Electrical Engineering; Professor of Computer Engineering
B.S., M.S., Ph.D. (North Carolina State 1982, 1984, 1987) [1987]

PIERRE PASCAL MASSION, Assistant Professor of Medicine; Assistant Professor of Cancer Biology
B.S., M.D. (Université Catholique de Louvain 1983, 1987) [2001]

RONALD W. MASULIS, Frank K. Houston Professor of Management (Finance)
B.A. (Northeastern 1971); M.B.A., Ph.D. (Chicago 1974, 1978) [1990]

LYNN M. MATRISIAN, Professor of Cancer Biology and Chair of the Department; Associate Professor of Obstetrics and Gynecology; Ingram Professor of Cancer Research
B.S. (Bloomsburg State 1975); Ph.D. (Arizona 1982) [1986]

ROBERT J. MATUSIK, Professor of Urologic Surgery; Professor of Cell and Developmental Biology; Professor of Cancer Biology
B.S. (Loyola 1970); Ph.D. (Rochester 1976) [1996]

JAMES M. MAY, Professor of Medicine; Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Yale 1969); M.D. (Vanderbilt 1973) [1986]

HOLLY J. MCCAMMON, Professor of Sociology; Associate Dean for Graduate Studies, College of Arts and Science
B.A. (Purdue 1982); A.M., Ph.D. (Indiana 1986, 1990) [1990]

JOHN A. MCCARTHY, Professor of German; Professor of Comparative Literature; Director, Max Kade Center for European and German Studies
B.A. (Oakland 1964); M.A., Ph.D. (SUNY, Buffalo 1967, 1972) [1991]

DEVIN LOCHLAN MCCASLIN, Assistant Professor of Hearing and Speech Sciences
B.S. (Northern Michigan 1992); M.S. (Wayne State 1995); Ph.D. (Ohio State 1999) [2003]

MICHAEL J. MCCAUGHEY, Research Assistant Professor of Molecular Physiology and Biophysics
B.S. (Notre Dame 1985); M.S., Ph.D. (Illinois 1988, 1991) [2005]

DAVID E. MCCAULEY, Professor of Biological Sciences
B.S. (Maryland 1972); Ph.D. (SUNY, Stony Brook 1976) [1980]

LISA J. MCCAWLEY, Research Assistant Professor of Cancer Biology
B.A. (Pennsylvania 1992); Ph.D. (Northwestern 1998) [2003]

KAY JOHNSON MCCLAIN, Associate Professor of Mathematics Education
B.S., M.Ed. (Auburn 1974, 1975); Ed.D. (Vanderbilt 1995) [1996]

BARBARA JO MCCLURE, Assistant Professor of Religion and Personality
B.A. (Houghton 1989); M.Div. (Princeton 1996); Ph.D. (Emory 2003) [2006]

JOHN S. MCCLURE, Charles G. Finney Professor of Homiletics; Professor of Homiletics; Chair of the Graduate Department of Religion
B.A. (University of the South 1974); M.Phil. (Glasgow 1976); M.Div. (Fuller Theological Seminary 1979); Ph.D. (Princeton Theological Seminary 1983) [2003]

THOMAS L. MCCURLEY III, Associate Professor of Pathology
B.E., M.D. (Vanderbilt 1970, 1974) [1983]

MICHAEL P. MCDONALD, Assistant Professor of Pharmacology; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Arizona State 1985); M.A. (New York 1990); Ph.D. (Minnesota 1994) [1999]

THOMAS A. J. MCGINN, Professor of Classics
A.B. (Harvard 1978); M.A. (Cambridge 1980); Ph.D. (Michigan 1986) [1986]

RICHARD MCGREGOR, Assistant Professor of Religious Studies
B.A. (Toronto 1990); M.A., Ph.D. (McGill 1993, 2001) [2003]

OWEN PATRICK MCGUINNESS, Associate Professor of Molecular Physiology and Biophysics
B.S. (SUNY, Stony Brook 1978); Ph.D. (Louisiana State 1983) [1984]

HASSANE S. MCHAOURAB, Associate Professor of Molecular Physiology and Biophysics
B.S., M.S. (American University of Beirut 1987, 1989); Ph.D. (Medical College of Wisconsin 1993) [2000]

JAMES OLIVER MCINTYRE, Research Professor of Cancer Biology
B.A., M.A. (Cambridge 1972, 1975); Ph.D. (Vanderbilt 1978) [2001]
RALPH MCKENZIE, Distinguished Professor of Mathematics
B.A., Ph.D. (Colorado 1963, 1966) [1994]
JOHN A. MCLEAN, Assistant Professor of Chemistry
B.S. (Michigan 1995); M.Phil., Ph.D. (George Washington 1998, 2001) [2006]
MICHAEL K. MCLENDON, Assistant Professor of Public Policy and Higher Education
B.A. (Baylor 1991); M.S. (Florida State 1994); Ph.D. (Michigan 2000) [1999]
DOUGLAS G. MCMAHON, Professor of Biological Sciences; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A., Ph.D. (Virginia 1980, 1986) [2002]
TIMOTHY P. MCNAMARA, Professor of Psychology, College of Arts and Science; Associate Provost for Faculty
B.G.S. (Kansas 1979); M.S., M.Phil., Ph.D. (Yale 1981, 1982, 1984) [1983]
JOSÉ MEDINA, Associate Professor of Philosophy
B.A. (Universidad de Sevilla 1991); M.A., Ph.D. (Northwestern 1995, 1998) [1999]
M. DOUGLAS MEEKS, Cal Turner Chancellor's Professor of Wesleyan Studies; Professor of Wesleyan Studies and Theology
B.A. (Rhodes 1963); B.D., Ph.D. (Duke 1966, 1971) [1998]
CHARLES K. MEGIBBEN, Professor of Mathematics, Emeritus
B.S. (Southern Methodist 1959); Ph.D. (Auburn 1963) [1967]
JENS MELLER, Assistant Professor of Chemistry
Vordiplom, Diplom (Leipzig [Germany] 1995); Ph.D. (Frankfurt [Germany] 2001) [2005]
ARTHUR M. MELLOR, Centennial Professor of Mechanical Engineering, Emeritus
B.S.E., M.A., Ph.D. (Princeton 1963, 1965, 1968) [1988]
MICHAEL H. MELNER, Professor of Obstetrics and Gynecology; Professor of Cell and Developmental Biology
B.S., M.S. (Nevada 1974, 1976); Ph.D. (Medical College of Georgia 1980) [1993]
HERBERT Y. MELTZER, Bixler/Johnson/Mays Professor of Psychiatry; Professor of Pharmacology; Director, Division of Psychopharmacology
B.A. (Cornell 1958); M.A. (Harvard 1959); M.D. (Yale 1963) [1996]
GEORGE E. METCALFE, Assistant Professor of Mathematics
B.A. (St. Anne's College [United Kingdom] 1996); M.Sc. (Edinburgh [United Kingdom] 1998); Ph.D. (King's College [United Kingdom] 2003) [2006]
BARBARA O. MEYRICK-CLARRY, Professor of Pathology; Professor of Medicine
M.Phil., Ph.D. (London 1974, 1976) [1981]
MICHAEL I. MIGA, Assistant Professor of Biomedical Engineering
B.S., M.S. (Rhode Island 1992, 1994); Ph.D. (Dartmouth 1998) [2000]
MICHAEL L. MIHALIK, Professor of Mathematics
B.S. (California State College [Pennsylvania] 1973); M.A., Ph.D. (SUNY, Binghamton 1977, 1979) [1982]
CALVIN F. MILLER, Professor of Earth and Environmental Sciences
B.A. (Pomona 1969); M.S. (George Washington 1973); Ph.D. (California, Los Angeles 1977) [1977]
GERALDINE G. MILLER, Professor of Medicine; Associate Professor of Microbiology and Immunology
S.B. (Massachusetts Institute of Technology 1969); M.D. (California, San Diego 1973) [1990]
MOLLY FRITZ MILLER, Professor of Earth and Environmental Sciences
B.A. (Wooster 1969); M.S. (George Washington 1971); Ph.D. (California, Los Angeles 1977) [1977]

RANDOLPH A. MILLER, Donald A. B. and Mary M. Lindberg University Professor of Biomedical Informatics; Professor of Medicine
A.B. (Princeton 1971); M.D. (Pittsburgh 1976) [1994]
TRACY G. MILLER, Assistant Professor of Art History
B.A. (Arizona State 1991); M.A., Ph.D. (Pennsylvania 1996, 2000) [2000]
DAVID M. MILLER III, Professor of Cell and Developmental Biology; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Southern Mississippi 1973); Ph.D. (Rice 1981) [1994]
BONNIE J. MILLER-MCLEMORE, Carpenter Professor of Pastoral Theology; Professor of Pastoral Counseling and Pastoral Theology (On leave spring 2007)
B.A. (Kalamazoo 1977); M.A., Ph.D. (Chicago 1980, 1986) [1995]
WILLIAM M. MITCHELL, Professor of Pathology
B.A., M.D. (Vanderbilt 1957, 1960); Ph.D. (Johns Hopkins 1966) [1966]
ROBERT L. MODE, Associate Professor of Art History
B.A. (Rochester 1962); M.A., Ph.D. (Michigan 1964, 1970) [1967]
GILBERT W. MOECKEL, Assistant Professor of Pathology; Assistant Professor of Medicine
M.D., Ph.D. (Ludwig Maximilians [Germany] 1989, 1993) [2000]
RYMOND A. MOHAGHEGH, Research Instructor in Pharmacology
M.S. (Nebraska 1987); M.S., Ph.D. (Arkansas 1991, 1994) [2005]
CATHERINE MOLINEUX, Assistant Professor of History
B.A., B.S. (Texas 1999, 1999); M.A., Ph.D. (Johns Hopkins 2002, 2005) [2005]
JASON D. MORROW, F. Tremaine Billings Professor of Medicine; Professor of Pharmacology; Director, Center for Pharmacology and Drug Toxicity; Associate Dean for Physician-Scientist Development
B.A. (Vanderbilt 1979); M.D. (Washington University 1983) [1994]
DOUGLAS PAUL MORTLOCK, Assistant Professor of Molecular Physiology and Biophysics; Assistant Professor of Pediatrics
B.A. (Cornell 1990); Ph.D. (Michigan 1997) [2002]
HAROLD L. MOSES, Hortense B. Ingram Professor of Molecular Oncology; Professor of Cancer Biology; Professor of Pathology; Professor of Medicine; Director, Emeritus, Vanderbilt-Ingram Cancer Center
B.A. (Berea 1958); M.D. (Vanderbilt 1962) [1985]
CLAUDIO A. MOSSE, Assistant Professor of Pathology
B.A. (Cornell 1992); M.D., Ph.D. (Virginia 2001, 2001) [2005]
EVANGELINE MOTLEY, Visiting Associate Professor of Pharmacology
B.A. (Virginia 1980); Ph.D. (Howard 1991) [2005]
NETA A. MOYE, Assistant Professor of Management (Organization Studies)
B.S. (Florida State 1987); M.A. (Illinois 1989); Ph.D. (Maryland 2000) [2000]
DEBORAH G. MURDOCK, Assistant Professor of Pediatrics; Assistant Professor of Pharmacology
B.S. (Georgia 1988); Ph.D. (Carnegie Mellon 1996) [2002]
JOSEPH F. MURPHY, Professor of Education; Associate Dean, Peabody College
B.A. (Muskingum 1971); M.S.T. (Chicago 1974); Ph.D. (Ohio State 1980) [2002]
MARILYN L. MURPHY, Professor of Art and Chair of the Department
B.F.A. (Oklahoma State 1972); M.F.A. (Oklahoma 1978) [1980]
KATHERINE T. MURRAY, Associate Professor of Medicine; Associate Professor of Pharmacology
B.S., M.D. (Duke 1976, 1980) [1989]
DEAN A. A. MYLES, Adjunct Professor of Biochemistry
B.Sc., Ph.D. (Keele [UK] 1986, 1989) [2005]

LILLIAN B. NANNEY, Professor of Plastic Surgery; Professor of Cell and Developmental Biology
B.A. (Vanderbilt 1973); M.S. (Austin Peay State 1977); Ph.D. (Louisiana State 1980) [1980]

MAURY NATION, Assistant Professor of Human and Organizational Development
B.A. (Georgia State 1992); Ph.D. (South Carolina 1999) [2003]

MARIAN NEAMTU, Associate Professor of Mathematics
C.Sc. (Slovak Technical University of Bratislava 1988); Drs. (Twente University of Technology 1991) [1992]

ERIC G. NEILSON, Hugh J. Morgan Professor of Medicine and Chair of the Department; Professor of Cell and Developmental Biology
B.S. (Denison 1971); M.D. (Alabama 1975); M.S. (Pennsylvania 1987) [1998]

CARIN LYNN NEITZEL, Associate Professor of Early Childhood Education
B.A., Ph.D. (Indiana 1996, 2003) [2003]

DANA D. NELSON, Gertrude Conaway Vanderbilt Professor of English; Professor of English
B.A. (Indiana [Pennsylvania] 1984); M.A., Ph.D. (Michigan State 1987, 1989) [2004]

JONATHAN NEUFELD, Assistant Professor of Philosophy
B.A. (Minnesota 1993); M.A. (King's College [London] 1994); Ph.D. (Columbia 2005) [2005]

NAGENDRA S. NINGARAJ, Research Associate Professor of Neurological Surgery; Research Associate Professor of Cancer Biology
B.Sc., M.Sc. (Mysore [India] 1978, 1980); Ph.D. (Bangalore 1993) [2004]

KEVIN DEAN NISWENDER, Assistant Professor of Medicine; Assistant Professor of Molecular Physiology and Biophysics
B.S. (Colorado College 1990); Ph.D., M.D. (Vanderbilt 1996, 1998) [2004]

DAVID C. NOELLE, Assistant Professor of Computer Science
B.S. (California, Los Angeles 1987); M.S., Ph.D. (California, San Diego 1992, 1997) [2001]

JEANETTE J. NORDEN, Professor of Cell and Developmental Biology; Professor of Neuroscience
B.A. (California, Los Angeles 1970); Ph.D. (Vanderbilt 1975) [1978]

LINDA D. NORMAN, Senior Associate Dean for Academics, School of Nursing; Professor of Nursing
B.S.N., M.S.N. (Virginia 1969, 1981); D.S.N. (Alabama, Birmingham 2001); R.N. [1988]

THOMAS P. NOVAK, Professor of Management (Marketing)
A.B. (Oberlin 1977); M.A., Ph.D. (North Carolina 1980, 1984) [1993]

LAURA R. NOVICK, Associate Professor of Psychology, Peabody College; Associate Professor of Psychology, College of Arts and Science
B.S. (Iowa 1981); Ph.D. (Indiana 1986) [1988]

IFEOMA C. K. NWANKWO, Associate Professor of English
B.A. (Rutgers 1994); Ph.D. (Duke 1999) [2006]

ANTHÈRE NZABATSINDA, Associate Professor of French
B.A. (Université nationale du Rwanda, Butare 1978); M.A., Ph.D. (Montréal 1986, 1993) [1996]

RICHARD M. O'BRIEN, Professor of Molecular Physiology and Biophysics
B.Sc. (Bristol 1984); Ph.D. (Cambridge 1988) [1988]

JOHN A. OATES, Thomas F. Frist Professor of Medicine; Professor of Pharmacology
B.A., M.D. (Wake Forest 1953, 1956) [1963]

VOLKER E. OBERACKER, Professor of Physics
Ph.D. (Johann Wolfgang Goethe Universität Frankfurt 1977) [1980]

JOSIAH OCHIENG, Associate Professor of Biochemistry at Meharry Medical College; Associate Professor of Cancer Biology at Vanderbilt
B.Sc. (Nairobi 1979); M.Sc., Ph.D. (Ohio State 1982, 1988) [1995]

MOSES E. OCHONU, Assistant Professor of History
B.A. (Bayero [Nigeria] 1997); M.A., Ph.D. (Michigan 1999, 2004) [2004]

THOMAS N. OELTMANN, Associate Professor of Medicine; Associate Professor of Biochemistry; Associate Professor of Biological Sciences
B.S. (Georgia State 1963); Ph.D. (Georgia 1967) [1979]

RALPH N. OHDE, Professor of Hearing and Speech Sciences; Member, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Carthage 1966); M.Ed. (Virginia 1968); Ph.D. (Michigan 1978) [1981]

ALEXANDER OL'SHANSKIY, Centennial Professor of Mathematics
B.S., Ph.D., D.Sc. (Moscow State 1968, 1971, 1979) [1998]

BUNMI O. OLATUNJI, Assistant Professor of Psychology
B.S. (Wisconsin, Stevens Point 2000); M.A., Ph.D. (Arkansas 2002, 2006) [2006]

ROWENA OLEGARIO, Assistant Professor of History
B.A. (Yale 1983); Ph.D. (Harvard 1998) [2001]

EMANUELLE K. F. OLIVEIRA, Assistant Professor of Portuguese
B.A. (Pontificia Universidade Católica [Brazil] 1988); B.A. (Universidade do Estado do Rio de Janeiro 1989); M.A., Ph.D. (California, Los Angeles 1994, 2001) [2002]

KELLY OLIVER, W. Alton Jones Professor of Philosophy; Professor of Philosophy
B.A. (Gonzaga 1979); M.A., Ph.D. (Northwestern 1980, 1987) [2004]

RICHARD L. OLIVER, Valere Blair Potter Professor of Management (Marketing)
B.S.M.E. (Purdue 1967); M.B.A., Ph.D. (Wisconsin 1969, 1973) [1990]

GARY E. OLSON, Professor of Cell and Developmental Biology
B.S., M.S. (Oregon 1967, 1968); Ph.D. (Washington University 1974) [1977]

EUGENE M. OLTZ, Professor of Microbiology and Immunology
A.B. (Cornell 1982); Ph.D. (Columbia 1987) [1993]

DAVID E. ONG, Professor of Biochemistry
B.A. (Wabash 1965); Ph.D. (Yale 1970) [1970]

BRUCE I. OPPENHEIMER, Professor of Political Science; Professor of Public Policy and Education
A.B. (Tufts 1967); M.A., Ph.D. (Wisconsin 1968, 1973) [1993]

BRIDGET ORR, Associate Professor of English
B.A. (Victoria University of Wellington [New Zealand] 1979); Ph.D. (Cornell 1995) [2002]

NEIL OSHEROFF, John Coniglio Professor of Biochemistry; Professor of Medicine
B.A. (Hobart 1974); Ph.D. (Northwestern 1979) [1983]

CAGLAR OSKAY, Assistant Professor of Environmental Engineering
B.S. (Middle East Technical [Turkey] 1998); M.S., M.S., Ph.D. (Rensselaer Polytechnic Institute 2000, 2001, 2003) [2006]

ROBERT H. OSSOFF, Guy M. Maness Professor of Otolaryngology and Chair of the Department; Professor of Hearing and Speech Sciences
A.B. (Bowdoin 1969); D.M.D, M.D. (Tufts 1973, 1975); M.S. (Northwestern 1981) [1986]

KEVIN G. OSTEEN, Professor of Obstetrics and Gynecology; Professor of Pathology; Director, Women's Reproductive Health Research Center
B.S. (South Carolina 1972); Ph.D. (Medical College of Georgia 1980) [1983]

LUCIUS TURNER OUTLAW, JR., Professor of Philosophy; Associate Provost for Undergraduate Education
B.A. (Fisk 1967); Ph.D. (Boston College 1972) [2000]

K. ARTHUR OVERHOLSER, Senior Associate Dean of the School of Engineering; Professor of Biomedical Engineering; Professor of Chemical Engineering
B.E. (Vanderbilt 1965); M.S., Ph.D. (Wisconsin 1966, 1969); P.E. [1971]

JAMES CONLIN PACE, Professor of Nursing
B.S.N. (Florida State 1978); M.S.N. (Vanderbilt 1981); D.S.N. (Alabama, Birmingham 1986); M.Div. (Vanderbilt 1988); R.N., A.N.P. [2002]

DAVID L. PAGE, Professor of Pathology; Professor of Preventive Medicine
B.A. (Yale 1962); M.D. (Johns Hopkins 1966) [1972]

TERRY L. PAGE, Professor of Biological Sciences; Director of the Neuroscience Studies Program; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A., M.A., Ph.D. (Texas 1970, 1971, 1974) [1980]

THOMAS J. PALMERI, Associate Professor of Psychology, College of Arts and Science
B.S. (Carnegie Mellon 1987); Ph.D. (Indiana 1995) [1995]

SOKRATES THEODORE PANTELIDES, William A. and Nancy F. McMinn Professor of Physics
B.S. (Northern Illinois 1969); M.S., Ph.D. (Illinois 1970, 1973) [1994]

HAROLD S. PARK, Assistant Professor of Civil and Environmental Engineering
B.S., M.S., Ph.D. (Northwestern 1999, 2001, 2004) [2005]

JANE H. PARK, Professor of Molecular Physiology and Biophysics
B.S., Ph.D. (Washington University 1946, 1952) [1954]

SOHEE PARK, Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Cambridge 1982); M.A. (Columbia 1985); Ph.D. (Harvard 1991) [2000]

FRANK L. PARKER, Distinguished Professor of Environmental and Water Resources Engineering; Professor of Management of Technology
S.B. (Massachusetts Institute of Technology 1948); M.S., Ph.D. (Harvard 1950, 1955); P.E. [1967]

FRITZ F. PARL, Professor of Pathology
M.D. (Georg-August-Universität Göttingen 1968); Ph.D. (New York Medical 1978) [1980]

DAVID C. PARSLEY, Associate Professor of Management (Managerial Economics)
B.S. (Kentucky 1977); A.M. (Indiana 1979); Ph.D. (California, Berkeley 1990) [1990]

WILLIAM L. PARTRIDGE, Professor of Human and Organizational Development; Professor of Anthropology
B.A., M.A., Ph.D. (Florida 1966, 1969, 1974) [2001]

CYNTHIA B. PASCHAL, Associate Professor of Biomedical Engineering; Associate Professor of Radiology and Radiological Sciences
S.B., S.M. (Massachusetts Institute of Technology 1986, 1986); Ph.D. (Case Western Reserve 1992) [1992]

DANIEL M. PATTE, Professor of Religious Studies; Professor of New Testament and Early Christianity
B.A. (Grenoble 1958); B.D. (Montpellier 1960); Th.M. (Geneva 1964); Th.D. (Chicago Theological Seminary 1971) [1971]

JAMES A. PATTON, Professor of Radiology and Radiological Sciences; Professor of Physics
B.S., Ph.D. (Western Kentucky 1966, 1972) [1973]

JAMES G. PATTON, Professor of Biological Sciences; Associate Professor of Biochemistry
B.A. (College of Saint Thomas 1980); Ph.D. (Mayo Graduate 1988) [1993]

BARBARA F. PEEK, Adjunct Assistant Professor of Hearing and Speech Sciences
B.A., M.A., M.A., Ph.D. (Northwestern 1965, 1966, 1968, 1982) [1985]

RICHARD M. PEEK, JR., Mina Cobb Wallace Professor of Gastroenterology and Cancer Prevention; Professor of Medicine; Associate Professor of Cancer Biology
B.S. (Davidson 1984); M.D. (North Carolina 1988) [1995]

JOHN S. PENN, Professor of Ophthalmology and Visual Sciences; Professor of Cell and Developmental Biology
B.A. (University of the South 1978); M.S. (West Florida 1981); Ph.D. (Florida State 1984) [1998]

MIKHAIL PEREPELITSA, Assistant Professor of Mathematics
B.S., M.S. (Novosibirsk State [Russia] 1996, 1998); Ph.D. (Northwestern 2004) [2006]

DOUGLAS D. PERKINS, Associate Professor of Human and Organizational Development
B.A. (Swarthmore 1980); M.A., Ph.D. (New York 1985, 1990) [2000]

DIANE PERPICH, Assistant Professor of Philosophy
B.A. (Bryn Mawr 1984); M.A., Ph.D. (Chicago 1987, 1997) [2001]

RICHARD ALAN PETERS II, Associate Professor of Electrical Engineering
A.B. (Oberlin 1979); M.S., Ph.D. (Arizona 1985, 1988) [1988]

TODD E. PETERSON, Assistant Professor of Radiology and Radiological Sciences; Director of Nuclear Imaging; Assistant Professor of Physics
B.A. (Gustavus Adolphus 1991); B.A. (Oxford 1993); M.S., Ph.D. (Indiana 1994, 2002) [2003]

CATHLEEN C. PETTEPHER, Professor of Cancer Biology; Professor of Cell and Developmental Biology; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S., B.S., Ph.D. (South Alabama 1985, 1987, 1990) [1990]

F. CARTER PHILIPS, Associate Professor of Classics
B.A. (Vanderbilt 1965); A.M., Ph.D. (Pennsylvania 1966, 1969) [1969]

KEVIN DANIEL PHILLIPS, Instructor in Clinical Emergency Medicine
B.S. (James Madison); M.D. (Medical College of Virginia 2001) [2006]

JOHN A. PHILLIPS III, David T. Karzon Professor of Pediatrics; Director, Division of Pediatric Genetics; Professor of Biochemistry; Professor of Medicine; Professor of Pathology; Clinical Professor of Nursing; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (North Carolina 1965); M.D. (Wake Forest 1969) [1984]

CHARLOTTE PIERCE-BAKER, Professor of Women's and Gender Studies; Professor of English
B.A. (Howard 1965); M.A. (Ohio State 1966); Ph.D. (Temple 1985) [2006]

JENNIFER A. PIETENPOL, Professor of Biochemistry; Ingram Professor of Cancer Research; Professor of Otolaryngology
B.A. (Carleton 1986); Ph.D. (Vanderbilt 1990) [1994]

BONITA PILON, Senior Associate Dean for Practice Management; Professor of Nursing
B.S.N. (Barry 1972); M.N. (Florida 1975); D.S.N. (Alabama 1988); R.N. [2000]

GEORGINE M. PION, Research Associate Professor of Psychology, Peabody College
B.A. (Simpson 1974); M.A., Ph.D. (Claremont 1977, 1980) [1989]

DAVID W. PISTON, Professor of Molecular Physiology and Biophysics; Professor of Physics; Director, W. M. Keck Free-Electron Laser Center; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Grinnell 1984); M.S., Ph.D. (Illinois 1986, 1989) [1992]

RICHARD N. PITT, JR., Assistant Professor of Sociology
B.S., M.Ed. (Pennsylvania State 1991, 1994); M.A., Ph.D. (Arizona 1999, 2003) [2003]

ROBERT W. PITZ, Professor of Mechanical Engineering and Chair of the Department
B.S. (Purdue 1973); M.S., Ph.D. (California, Berkeley 1975, 1981); P.E. [1986]

JOHN F. PLUMMER III, Professor of English
B.A. (Northern Illinois 1966); M.A. (Indiana 1968); Ph.D. (Washington University 1971) [1971]

MICHAEL D. PLUMMER, Professor of Mathematics
B.A. (Wabash 1959); M.S., Ph.D. (Michigan 1961, 1966) [1970]

PRASAD L. POLAVARAPU, Professor of Chemistry
B.Sc. (Andhra 1970); M.Sc. (Birla Institute of Technology and Science 1972); Ph.D. (Indian Institute of Technology 1977) [1980]

DAVID BRENT POLK, Professor of Pediatrics; Professor of Cell and Developmental Biology; Director, Division of Pediatric Gastroenterology
B.S. (Ouachita Baptist 1980); M.D. (University of Arkansas for Medical Sciences 1984) [1990]

NED ALLEN PORTER, Stevenson Professor of Chemistry and Chair of the Department; Professor of Biochemistry
B.S.Ch.E. (Princeton 1965); Ph.D. (Harvard 1970) [1998]

ALEXANDER M. POWELL, Assistant Professor of Mathematics
B.S. (Rutgers 1997); M.A., Ph.D. (Maryland 1999, 2003) [2005]

ALVIN C. POWERS, Ruth King Scoville Professor of Medicine; Professor of Molecular Physiology and Biophysics; Professor of Medicine
B.A. (Virginia 1976); M.D. (Tennessee 1979) [1988]

AMBRA POZZI, Assistant Professor of Medicine; Assistant Professor of Cancer Biology
Ph.D. (Florence [Italy] 1996) [2000]

HARISH C. PRASAD, Instructor in Pharmacology
M.D., Ph.D. (Gauhati [India] 1982, 1989) [2005]

ANITA M. PREININGER, Research Assistant Professor of Pharmacology
B.S. (Lewis 1987); Ph.D. (Northwestern 2003) [2006]

JAMES O. PRICE, Associate Professor of Pathology
B.S., M.S., Ph.D. (Memphis State 1968, 1974, 1982) [1994]

RONALD R. PRICE, Hounsfield Professor of Radiology and Radiological Sciences and Director of the Division of Radiological Sciences; Hounsfield Chair in Radiology; Pr ofessor of Physics; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Western Kentucky 1964); Ph.D. (Vanderbilt 1971) [1973]

RICHARD A. PRIDE, Associate Professor of Political Science, Emeritus
B.A. (Stanford 1964); M.A. (California, Santa Barbara 1965); Ph.D. (Minnesota 1970) [1968]

RENÉ PRIETO, Professor of Spanish
B.A., M.A. (Sorbonne 1973, 1974); B.A. (Institut des Langues Orientales 1974); Ph.D. (Stanford 1980) [2002]

ISAAC PRILLELTENSKY, Professor of Human and Organizational Development
B.A. (Bar-Ilan 1980); M.A. (Tel Aviv 1983); Ph.D. (Manitoba 1989) [2003]

JOE B. PUTNAM, JR., Professor of Thoracic Surgery and Chair of the Department; Professor of Biomedical Informatics; Ingram Professor of Cancer Biology
A.B., M.D. (North Carolina 1975, 1979) [2004]

SHIMIAN QU, Research Assistant Professor of Cancer Biology
B.S. (Beijing Agricultural 1984); Ph.D. (Vanderbilt 1993) [1997]

VITO QUARANTA, Professor of Cancer Biology
M.D. (Bari [Italy] 1974) [2003]

DAVID L. RADOS, Professor of Management (Marketing), Emeritus
B.S. (Massachusetts Institute of Technology 1955); M.B.A. (Harvard 1960); Ph.D. (Stanford 1968) [1977]

CHARU G. RAHEJA, Assistant Professor of Management (Finance)
B.S. (Florida 1994); M.Phil., Ph.D. (New York 1997, 2001) [2001]

RAYANN M. RALLS, Assistant Professor of Clinical Anesthesiology
B.A. (Puget Sound 1998); M.D. (University of Washington School of Medicine 2002) [2006]

AKUNURI V. RAMAYYA, Professor of Physics
B.Sc. hons., M.Sc. (Andhra 1957, 1958); Ph.D. (Indiana 1964); Dr .Phil.Nat.Hon.Causa (Bucharest [Romania] 1999) [1964]

LYNN TARTE RAMEY, Associate Professor of French
B.A.S., B.A. (Pennsylvania 1986); M.A. (Indiana 1991); Ph.D. (Harvard 1997) [2001]
MATTHEW RAMSEY, Associate Professor of History
A.B., A.M., Ph.D. (Harvard 1969, 1971, 1978) [1984]
ARASADA R. RAO, Research Instructor in Cancer Biology
B.Sc. (Maharaja Autonomous College [India] 1993); M.Sc. (Hyderabad [India] 1996); Ph.D. (Indian Institute of Science 2002) [2006]
RANDOLPH F. R. RASCH, Professor of Nursing
B.S. (Nursing) (Andrews 1974); M.S.N. (Vanderbilt 1979); Ph.D. (Texas, Austin 1988); R.N., F.N.P., B.C. [2002]
PHILIP D. RASICO, Professor of Spanish and Portuguese
A.B. (Xavier 1974); A.M., Ph.D. (Indiana 1975, 1981) [1984]
JOHN G. RATCLIFFE, Professor of Mathematics
B.S., A.M., Ph.D. (Michigan 1970, 1973, 1977) [1985]
JAMES LEE RAY, Professor of Political Science
B.A., M.A. (Ohio State 1966, 1968); Ph.D. (Michigan 1974) [1996]
FRANCO MARIA RECCHIA, Assistant Professor of Ophthalmology and Visual Sciences
B.S. (Wayne State 1991); M.D. (Duke 1996) [2003]
ROBERT A. REED, Research Associate Professor of Electrical Engineering and Computer Science
B.S. (East Tennessee State 1990); M.S., Ph.D. (Clemson 1993, 1994) [2004]
JENNIFER F. REINGANUM, E. Bronson Ingram Professor of Economics; Professor of Law
B.A. (Oberlin 1976); M.A., Ph.D. (Northwestern 1978, 1979) [1995]
NANCY B. REISMAN, Assistant Professor of English
B.A. (Tufts 1984); M.F.A. (Massachusetts 1991) [2005]
DANIEL J. RESCHLY, Professor of Education; Professor of Psychology, Peabody College; Chair, Department of Special Education; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Iowa State 1966); M.A. (Iowa 1968); Ph.D. (Oregon 1971) [1998]
ALBERT B. REYNOLDS, Professor of Cancer Biology
B.A. (Kenyon 1978); Ph.D. (Virginia 1985) [1996]
J. ANN RICHMOND, Ingram Professor of Cancer Biology; Professor of Medicine; Professor of Cell and Developmental Biology; Assistant Dean for Biomedical Research, Education, and Training
B.S. (Northeast Louisiana 1966); M.N.S. (Louisiana State 1972); Ph.D. (Emory 1979) [1989]
TODD A. RICKETTS, Associate Professor of Hearing and Speech Sciences
B.A., M.A., Ph.D. (Iowa 1989, 1991, 1995) [1999]
JOHN J. RIESER, Professor of Psychology, Peabody College; Member, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Harvard 1971); Ph.D. (Minnesota 1978) [1977]
VICTORIA J. RISKO, Professor of Education
B.S. (Pittsburgh 1966); M.A., Ed.D. (West Virginia 1969, 1971) [1975]
MARYLYN DERIGGI RITCHIE, Assistant Professor of Molecular Physiology and Biophysics
B.S. (Pittsburgh, Johnstown 1999); M.S., Ph.D. (Vanderbilt 2002, 2004) [2004]
BETHANY RITTLE-JOHNSON, Assistant Professor of Psychology, Peabody College; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Virginia 1994); M.S., Ph.D. (Carnegie Mellon 1996, 1999) [2002]
CARMELO JOSEPH RIZZO, Associate Professor of Chemistry
B.S. (Temple 1984); Ph.D. (Pennsylvania 1990) [1992]
L. JACKSON ROBERTS II, Professor of Pharmacology; Professor of Medicine
B.A. (Cornell 1965); M.D. (Iowa 1969) [1977]

DAVID ROBERTSON, Elton Yates Professor of Autonomic Disorders; Professor of Medicine; Professor of Pharmacology; Professor of Neurology
B.A., M.D. (Vanderbilt 1969, 1973) [1978]

WILLIAM FRANCIS ROBINSON, Assistant Professor of History; Associate Director, Center for Latin American and Iberian Studies
B.A. (Johns Hopkins 1984); M.A. (Florida 1988); Ph.D. (Auburn 1999) [2002]

WILLIAM H. ROBINSON III, Assistant Professor of Electrical Engineering
B.S. (Florida Agricultural and Mechanical 1996); M.S., Ph.D. (Georgia Institute of Technology 1998, 2003) [2003]

DAN M. RODEN, William Stokes Professor of Experimental Therapeutics; Professor of Medicine; Professor of Pharmacology; Director, Institute of Experimental Therapeutics
B.Sc., M.D.,C.M. (McGill 1970, 1974) [1981]

ANNA WANG ROE, Associate Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Harvard 1984); Ph.D. (Massachusetts Institute of Technology 1991) [2003]

RUTH ROGASKI, Associate Professor of History
B.A. (Pennsylvania 1984); M.A., Ph.D. (Yale 1990, 1996) [2003]

BRIDGET R. ROGERS, Associate Professor of Chemical Engineering
B.S. (Colorado 1984); M.S., Ph.D. (Arizona State 1990, 1998) [1998]

R. ANTHONY ROLLE, Assistant Professor of Public Policy and Education
B.S. (Santa Clara 1988); M.P.A. (Washington 1992); Ph.D. (Indiana 2000) [2002]

LOUISE A. ROLLINS-SMITH, Associate Professor of Microbiology and Immunology; Assistant Professor of Pediatrics
B.A. (Hamline 1969); M.S., Ph.D. (Minnesota 1972, 1977) [1984]

ROBERT J. ROSELLI, Professor of Biomedical Engineering; Professor of Chemical Engineering
B.S., M.S., Ph.D. (California, Berkeley 1969, 1972, 1975) [1976]

SAMUEL TRENT ROSENBLOOM, Assistant Professor of Biomedical Informatics; Instructor in Medicine; Instructor in Clinical Nursing; Instructor in Pediatrics
B.A. (Northwestern 1992); M.D. (Vanderbilt 1996) [2001]

SANDRA J. ROSENTHAL, Associate Professor of Chemistry; Associate Professor of Physics
B.S. (Valparaiso 1987); Ph.D. (Chicago 1992) [1996]

NORBERT ROSS, Assistant Professor of Anthropology
M.A., Ph.D., Habilitation (Freiburg[Germany] 1995, 1998, 2002) [2003]

JOHN A. ROTH, Professor of Chemical Engineering, Emeritus; Professor of Environmental Engineering, Emeritus
B.Ch.E., M.Ch.E., Ph.D. (Louisville 1956, 1957, 1961); P.E. [1962]

PETER L. ROUSSEAU, Associate Professor of Economics; Vice Chair of the Department
B.A., M.S. (Iona 1983, 1986); Ph.D. (New York 1995) [1995]

DEBORAH W. ROWE, Associate Professor of Early Childhood Education
B.S. (Kentucky 1976); M.A.Educ. (Wake Forest 1982); Ph.D. (Indiana 1986) [1986]

CAROL RUBIN, Professor of Mechanical Engineering
B.S. (Columbia 1966); M.S., Ph.D. (Kansas State 1969, 1971); P.E. [1980]

DONALD H. RUBIN, Professor of Medicine; Professor of Microbiology and Immunology
B.A. (SUNY, Stony Brook 1969); M.D. (Cornell 1974) [1992]

EDWARD L. RUBIN, Dean of the Law School; John Wade–Kent Syverud Professor of Law
A.B. (Princeton 1969); J.D. (Yale 1979) [2005]

HENRY EARL RULEY, Professor of Microbiology and Immunology; Ingram Professor of Cancer Research
A.B. (Stanford 1974); Ph.D. (North Carolina 1980) [1992]

WILLIAM EVANS RUSSELL, Associate Professor of Pediatrics; Associate Professor of Cell and Developmental Biology; Director, Division of Pediatric Endocrinology
B.S. (Michigan 1972); M.D. (Harvard 1976) [1990]

EDWARD B. SAFF, Professor of Mathematics; Executive Dean, College of Arts and Science
B.S. (Georgia Institute of Technology 1964); Ph.D. (Maryland 1968) [2001]
MICHELE S. SALISBURY, Assistant Professor of Nursing; Lecturer in Women's and Gender Studies
M.S.N. (Vanderbilt 1985); Ph.D. (Texas 1993); R.N., W.H.N.P. [1994]
SHAWN SALVANT, Assistant Professor of English
B.A. (Duke 1996); Ph.D. (California, Berkeley 2003) [2003]
FLORENCE SANCHEZ, Assistant Professor of Civil and Environmental Engineering
D.E.A., Ph.D. (National Institute of Applied Sciences 1992, 1995) [2000]
CHARLES R. SANDERS II, Professor of Biochemistry
B.S. (Milligan 1983); Ph.D. (Ohio State 1988) [2002]
ELAINE SANDERS-BUSH, Professor of Pharmacology; Professor of Psychiatry; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Director, Vanderbilt Brain Institute
B.S. (Western Kentucky 1962); Ph.D. (Vanderbilt 1967) [1968]
HOWARD M. SANDLER, Professor of Psychology, Peabody College; Assistant to the Provost, Peabody College
B.A. (Johns Hopkins 1967); M.A., Ph.D. (Northwestern 1969, 1971) [1970]
SAMUEL ANDREW SANTORO, Dorothy B. and Theodore R. Austin Professor of Pathology and Chair of the Department; Professor of Biochemistry
B.S. (Emory 1972); M.D., Ph.D. (Vanderbilt 1979, 1979) [2003]
MARK V. SAPIR, Centennial Professor of Mathematics; Professor of Mathematics
Diploma (Ural State 1978); Ph.D. (Moscow Pedagogical Institute 1983) [1997]
NILANJAN SARKAR, Associate Professor of Mechanical Engineering; Associate Professor of Computer Engineering
B.E. (Calcutta 1985); M.E. (Indian Institute of Science 1988); Ph.D. (Pennsylvania 1993) [2000]
JACK M. SASSON, Mary Jane Werthan Professor of Jewish Studies and Hebrew Bible; Professor of Classics
B.A. (Brooklyn 1962); Ph.D. (Brandeis 1966) [1999]
DIDIER SAUMON, Research Assistant Professor of Physics and Astronomy
B.Sc. (Montreal 1983); M.S. (Illinois 1985); Ph.D. (Rochester 1990) [1996]
KAYE SAWYER SAVAGE, Assistant Professor of Earth and Environmental Sciences; Assistant Professor of Civil and Environmental Engineering
B.A. (Pomona 1989); B.S. (Portland State 1993); Ph.D. (Stanford 2001) [2001]
MEGAN M. SAYLOR, Assistant Professor of Psychology, Peabody College; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (California, Berkeley 1996); M.S., Ph.D. (Oregon 1997, 2001) [2001]
STEPHEN R. SCHACH, Associate Professor of Computer Science; Associate Professor of Computer Engineering
B.Sc., B.Sc. hons, M.Sc. (Cape Town 1966, 1967, 1969); M.Sc. (Weizmann Institute of Science 1972); Ph.D. (Cape Town 1973) [1983]
JEFFREY D. SCHALL, E. Bronson Ingram Professor of Neuroscience; Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Denver 1982); Ph.D. (Utah 1986) [1989]
LEONA SCHAUBLE, Professor of Education
A.B. (Bates 1968); Ph.D., M.A. (Columbia 1989, 1996) [2002]
ERIC SCHECHTER, Associate Professor of Mathematics
B.S. (Maryland 1973); M.S., Ph.D. (Chicago 1975, 1978) [1980]
DAVID T. SCHEFFMAN, Adjunct Professor of Management (Policy and Strategy)
B.A. (Minnesota 1967); Ph.D. (Massachusetts Institute of Technology 1971) [1989]

ROBERT J. SCHERRER, Professor of Physics and Chair of the Depar tment of Physics and Astronomy
A.B. (Princeton 1981); M.A. (Cambridge 1983); Ph.D. (Chicago 1986) [2003]
DAVID G. SCHLUNDT, Associate Professor of Psychology, College of Arts and Science; Assistant Professor of Medicine
A.B. (Indiana 1976); M.S. (Wisconsin 1979); Ph.D. (Indiana 1982) [1985]
DOUGLAS C. SCHMIDT, Professor of Computer Science and Associate Chair of the Department
B.A., M.A. (William and Mary 1984, 1986); M.S., Ph.D. (Californ ia, Irvine 1990, 1994) [2002]
KARL B. SCHNELLE, JR., Professor of Chemical Engineering; Professor of Environmental Engineering
B.S., M.S., Ph.D. (Carnegie Institute of Technology 1952, 1957, 1959); P.E. [1967]
H. LORRAINE SCHNIEDERS, Assistant Clinical Professor of Human and Organizational Development
B.A. (Northern Kentucky 1975); M.Ed. (Xavier 1985); Ed.D. (Louisville 1999) [2002]
MICHAEL J. SCHOENFELD, Lecturer in Education
B.A. (Duke 1984); M.S. (SUNY, Stony Brook 1986) [2001]
MARK L. SCHOENFIELD, Associate Professor of English
B.A. (Yale 1981); A.M., M.P.W., Ph.D. (Southern California 1986, 1986, 1989) [1990]
RONALD D. SCHRIMPF, Professor of Electrical Engineering; Professor of Computer Engineering
B.E.E., M.S.E.E., Ph.D. (Minnesota 1981, 1984, 1986) [1996]
KENNETH E. SCHRIVER, Senior Lecturer in Physics
B.A. (Reed 1985); Ph.D. (California, Los Angeles 1990) [2001]
C. MELANIE SCHUELE, Assistant Professor of Hearing and Speech Sciences; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S.Ed. (Miami 1981); M.A. (Texas 1985); Ph.D. (Kansas 1995) [2002]
LARRY L. SCHUMAKER, Stevenson Professor of Mathematics
B.S. (South Dakota School of Mines 1961); M.S., Ph.D. (Stanfor d 1962, 1966) [1988]
THOMAS ALAN SCHWARTZ, Professor of History
A.B. (Columbia 1976); M.A. (Oxford 1978); A.M., Ph.D. (Harvard 1979, 1985) [1990]
KATHRYN SCHWARZ, Associate Professor of English
A.B., M.A., Ph.D. (Harvard 1988, 1990, 1994) [1996]
CHARLES E. SCOTT, Distinguished Professor of Philosophy
B.D. (Southern Methodist 1957); B.D., M.A., Ph.D. (Yale 1961, 1962, 1965) [2005]
VIRGINIA M. SCOTT, Associate Professor of French; Chair, Department of French and Italian
B.A. (Eckerd 1973); M.A. (Florida State 1975); Ph.D. (Emor y 1987) [1988]
GARY D. SCUDDER, Professor of Management (Operations Management); Associate Dean of the M.B.A. Program
B.S., M.S. (Purdue 1974, 1975); Ph.D. (Stanford 1981) [1990]
LINDA SEALY, Associate Professor of Molecular Physiology and Biophysics; Associate Professor of Cell and Developmental Biology
B.A. (Illinois Wesleyan 1976); Ph.D. (Iowa 1980) [1986]
FERNANDO F. SEGOVIA, Oberlin Graduate Professor of New Testament; Professor of New Testament and Early Christianity
B.A. (Pontifical College Josephinum 1970); M.A., Ph.D. (Notr e Dame 1976, 1978) [1984]
ANDRIANE E. SEIFFERT, Assistant Professor of Psychology
B.S. (Waterloo 1995); M.A., Ph.D. (Harvard 1998, 2000) [2004]
MITCHELL A. SELIGSON, Centennial Professor of Political Science; Professor of Political Science
B.A. (City University of New York 1967); M.A. (Florida 1968); Ph.D. (Pittsburgh 1974) [2004]

GREGORY C. SEPHEL, Associate Professor of Pathology
B.S. (California, Irvine 1973); Ph.D. (Utah 1986) [1988]
MARGARET ELEANOR SETJE-EILERS, Mellon Assistant Professor of German
B.A. (Sarah Lawrence 1968); M.A. (Friedrich-Alexander-Universität Erlangen-Nürnberg 1983); M.A. (Indiana 1997); Ph.D. (Virginia 2003) [2003]
DIETER H. O. SEVIN, Professor of Germanic Languages and Literatures and Chair of the Department
B.A. (San Jose State 1963); M.A., Ph.D. (University of Washington 1964, 1967) [1968]
TRACY DENEAN SHARPLEY-WHITING, Professor of African American and Diaspora Studies; Professor of French; Director, African American and Diaspora Studies Program; Director, William T. Bandy Center for Baudelaire and Modern French Studies
B.A. (Rochester 1989); M.A. (Miami [Ohio] 1990); Ph.D. (Brown 1994) [2004]
VENKATRAM PRASAD SHASTRI, Assistant Professor of Biomedical Engineering
B.S. (Bombay 1987); M.S. (Kentucky 1989); Ph.D. (Rensselaer Polytechnic Institute 1995) [2004]
PAUL D. SHELDON, Professor of Physics
A.B., Ph.D. (California, Berkeley 1980, 1986) [1991]
RICHARD C. SHELTON, James G. Blakemore Professor of Psychiatry; Professor of Pharmacology; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Director, Division of Adult Psychiatry
B.S. (East Tennessee State 1975); M.D. (Louisville 1979) [1985]
VIRGINIA L. SHEPHERD, Professor of Pathology; Associate Professor of Biochemistry; Professor of Medicine
B.S., M.S., Ph.D. (Iowa 1970, 1972, 1975) [1988]
RICHARD G. SHIAVI, Professor of Biomedical Engineering; Professor of Electrical Engineering; Assistant Professor of Orthopaedics and Rehabilitation
B.S. (Villanova 1965); M.S., Ph.D. (Drexel Institute of Technology 1969, 1972) [1972]
BIH-HWA SHIEH, Associate Professor of Pharmacology and Vice Chair of the Department
B.S., M.S. (National Taiwan 1979, 1981); Ph.D. (SUNY, Stony Brook 1986) [1991]
MOTOTSUGU SHINTANI, Assistant Professor of Economics
B.A., M.A. (Osaka 1991, 1993); M.Phil., Ph.D. (Yale 1998, 2000) [2000]
MASAKAZU SHIOTA, Assistant Professor of Molecular Physiology and Biophysics
B.Vet. (Rakuno Gakuen [Japan] 1976); D.V.M. (Ministry of Agriculture and Forestry of Japan 1976); M.Agr., Ph.D. (Osaka Prefecture 1978, 1987) [1996]
MIKHAEL SHOR, Assistant Professor of Management (Economics)
B.A. (Virginia 1994); M.A., Ph.D. (Rutgers 1997, 2001) [2001]
EDWARD K. SHULTZ, Associate Professor of Biomedical Informatics; Associate Professor of Pathology
B.S. (Oregon 1975); M.D. (Yale 1979); M.S. (Minnesota 1984) [1997]
VENIAMIN YU SIDOROV, Research Assistant Professor of Biomedical Engineering
Ph.D. (Russian Academy of Sciences [Pushchino] 2000) [2004]
JOHN J. SIEGFRIED, Professor of Economics
B.S. (Rensselaer Polytechnic Institute 1967); M.A. (Pennsylvania State 1968); M.S., Ph.D. (Wisconsin 1971, 1972) [1972]
WILLIAM G. SIESSER, Professor of Geology, Emeritus
B.S. (Kansas 1962); M.S. (Louisiana State 1967); Ph.D. (Cape Town 1971) [1979]
GIERI SIMONETT, Associate Professor of Mathematics
M.S., Ph.D. (Universität Zürich 1988, 1992) [1995]
VAUGHN G. SINCLAIR, Professor of Nursing
B.S.N., M.S.N. (Vanderbilt 1974, 1978); Ph.D. (Peabody 1982); R.N.–C.S. [1982]

CHARLES K. SINGLETON, Professor of Biological Sciences and Chair of the Depar tment; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Georgia 1976); Ph.D. (Purdue 1980) [1984]

ROBBERT JACOBUS C. SLEBOS, Research Assistant Professor of Cancer Biology; Research Assistant Professor of Otolaryngology
B.Sc., M.Sc. (Utrecht 1983, 1986); Ph.D. (Amsterdam 1991) [2003]

JAMES E. SLIGH, JR., Assistant Professor of Medicine; Assistant Professor of Cell and Developmental Biology
A.B. (Washington University 1986); Ph.D., M.D. (Baylor 1993, 1995) [2000]

JOHN M. SLOOP, Professor of Communication Studies and Chair of the Depar tment
B.S. (Appalachian State 1985); M.A. (Georgia 1988); Ph.D. (Iowa 1992) [1995]

CRAIG A. SMITH, Associate Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Dartmouth 1980); Ph.D. (Stanford 1986) [1988]

HELMUT WALSER SMITH, Martha Rivers Ingram Professor of History; Professor of History; Director, Robert Penn Warren Center for the Humanities
A.B. (Cornell 1984); M.Phil., Ph.D. (Yale 1988, 1992) [1991]

JEFFREY ROSER SMITH, Assistant Professor of Medicine; Assistant Professor of Cancer Biology; Ingram Assistant Professor of Cancer Research
A.B. (Harvard 1985); M.D., Ph.D. (Texas Southwestern Medical School 1992) [1999]

TED A. SMITH, Director of the Program in Theology and Practice; Assistant Professor of Ethics and Preaching
B.A. (Duke 1990); B.A. (Oxford 1992); M.Div. (Princeton 1995); Ph.D. (Emory 2004) [2005]

THOMAS M. SMITH, Assistant Professor of Public Policy and Education
B.A. (California. Los Angeles 1988); M.A. (Columbia 1991); M.A. (Catholic 1995); Ph.D. (Pennsylvania State 2000) [2001]

WILLIAM P. SMITH, Professor of Psychology, College of Arts and Science
B.A. (Duke 1958); M.A., Ph.D. (North Carolina 1962, 1963) [1965]

CLAIRE E. SMREKAR, Associate Professor of Public Policy and Education
B.A. (California, Los Angeles 1982); M.A., M.A., Ph.D. (Stanford 1986, 1989, 1991) [1991]

C. MELISSA SNARR, Assistant Professor of Ethics and Society
B.A. (Furman 1992); M.Div. (Candler School of Theology 1995); Ph.D. (Emory 2004) [2003]

JAY SNODDY, Associate Professor of Biomedical Informatics
B.S. (Bucknell 1980); Ph.D. (Yale 1990) [2005]

LILIANNA SOLNICA-KREZEL, Professor of Biological Sciences
Magister (Warsaw 1985); Ph.D. (Wisconsin 1991) [1996]

E. MICHELLE SOUTHARD-SMITH, Assistant Professor of Medicine; Assistant Professor of Cell and Developmental Biology; Member, Vanderbilt Kennedy Center for Research on Human Development
Ph.D. (Texas Southwestern Medical Center 1992) [1999]

ANDRE PORTELA SOUZA, Adjoint Assistant Professor of Economics
B.A. (Federal University of Bahia [Brazil] 1990); M.A. (São Paulo 1995); M.A., Ph.D. (Cornell 1999, 2001) [2001]

ANNA SPAGNOLI, Assistant Professor of Pediatrics; Assistant Professor of Cancer Biology
M.D. (Tor Vergata [Rome] 1988) [2001]

PAUL W. SPEER, Associate Professor of Human and Organizational Development
B.S. (Baker 1982); Ph.D. (Missouri, Kansas City 1992) [2001]

HORTENSE J. SPILLERS, Gertrude Conaway Vanderbilt Professor of English; Professor of English
B.A., M.A. (Memphis 1964, 1966); Ph.D. (Brandeis 1974) [2006]

JEREMY P. SPINRAD, Associate Professor of Computer Science
B.S. (Yale 1978); M.S.E., M.A., Ph.D. (Princeton 1979, 1980, 1982) [1985]

SUBRAMANIAM SRIRAM, William C. Weaver Professor of Experimental Neurology; Professor of Neurology; Professor of Microbiology and Immunology
M.B.,B.S. (Madras 1973) [1993]

ROBERT E. STAMMER, JR., Associate Professor of Civil Engineering; Director, Engineering Science Program
B.S. (Middle Tennessee State 1971); B.E. (Vanderbilt 1972); M.S. (Georgia Institute of Technology 1974); Ph.D. (Tennessee 1981); P.E. [1981]

JOHN MALOTTE STARMER, Assistant Professor of Biomedical Informatics
B.S. (North Carolina State 1989); M.D. (Wake Forest 1995) [2004]

KEIVAN GUADALUPE STASSUN, Assistant Professor of Astronomy
A.B. (California, Berkeley 1994); Ph.D. (Wisconsin 2000) [2003]

WILLIAM W. STEAD, Associate Vice Chancellor for Health Affairs; Professor of Medicine; Professor of Biomedical Informatics; Director, Informatics Center
A.B., M.D. (Duke 1970, 1973) [1991]

JAMES H. STEIGER, Professor of Psychology, Peabody College
B.A. (Cornell 1970); M.S. (Oklahoma 1972); Ph.D. (Purdue 1976) [2003]

RICHARD A. STEIN, Research Instructor in Molecular Physiology and Biophysics
B.A. (California, San Diego 1986); M.Sc., Ph.D. (Minnesota 1989, 1992) [1997]

ROLAND W. STEIN, Professor of Molecular Physiology and Biophysics; Professor of Cell and Developmental Biology
B.A. (California, Los Angeles 1975); M.A., Ph.D. (Albert Einstein 1980, 1981) [1986]

RONNIE J. STEINBERG, Professor of Sociology
B.A. (Bennington 1969); M.A., Ph.D. (New York 1973, 1977) [1997]

SUSANNE JOHANNA STERBING-D'ANGELO, Research Assistant Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
Diplom-Biologe (Rheinisch Friedrich-Wilhelms Universität [Germany] 1990); Dr. rer. nat. (Ruhr-Universität [Germany] 1995) [2003]

PHOEBE L. STEWART, Associate Professor of Molecular Physiology and Biophysics
A.B. (Harvard 1984); Ph.D. (Pennsylvania 1987) [2002]

HANS R. STOLL, Anne Marie and Thomas B. Walker Jr. Professor of Finance; Director, Financial Markets Research Center
B.A. (Swarthmore 1961); M.B.A., Ph.D. (Chicago 1963, 1966) [1980]

MICHAEL P. STONE, Professor of Chemistry
B.S. (California, Davis 1977); Ph.D. (California, Irvine 1981) [1984]

WENDY L. STONE, Professor of Pediatrics; Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Williams 1975); M.S., Ph.D. (Miami [Florida] 1981, 1981) [1988]

KEVIN STRANGE, John C. Parker Professor of Anesthesiology; Professor of Pharmacology; Professor of Molecular Physiology and Biophysics
B.S., M.A. (California 1977, 1978); Ph.D. (British Columbia 1983) [1997]

CHARLES W. STRATTON, Associate Professor of Pathology; Associate Professor of Medicine
B.S. (Bates 1967); M.D. (Vermont 1971) [1979]

ALVIN M. STRAUSS, Professor of Mechanical Engineering
B.A. (City University of New York, Hunter College 1964); Ph.D. (West Virginia 1968) [1982]

ARNOLD W. STRAUSS, James C. Overall Professor of Pediatrics and Chair of the Department; Professor of Molecular Physiology and Biophysics; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Stanford 1966); M.D. (Washington University 1970) [2000]

GERALD J. STUBBS, Professor of Biological Sciences; Professor of Molecular Biology
B.Sc. (Australian National 1968); D.Phil. (Oxford 1972) [1983]
JOHN J. STUHR, W. Alton Jones Professor of Philosophy; Professor of Philosophy; Professor of American Studies
B.A. (Carleton 1973); M.A., Ph.D. (Vanderbilt 1975, 1976) [2003]
GARY ALLEN SULIKOWSKI, Professor of Chemistry
B.S. (Wayne State 1983); Ph.D. (Pennsylvania 1989) [2004]
MICHELLE MILLER SULIKOWSKI, Senior Lecturer in Chemistry
B.A. (Rosemont 1986); Ph.D. (Pennsylvania 1991) [2004]
MARSHALL LYNN SUMMAR, Associate Professor of Pediatrics; Associate Professor of Molecular Physiology and Biophysics; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Vanderbilt 1981); M.D. (Tennessee 1985) [1990]
ZU-WEN SUN, Assistant Professor of Biochemistry
B.S. (Tunghai 1983); M.A. (North Carolina State 1991); Ph.D. (Louisiana State 1996) [2003]
JAMES S. SUTCLIFFE, Associate Professor of Molecular Physiology and Biophysics; Associate Professor of Psychiatry; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Auburn 1986); Ph.D. (Emory 1992) [1997]
CAROL M. SWAIN, Professor of Political Science; Professor of Law; Senior Fellow, Institute for Public Policy Studies
B.A. (Roanoke 1983); M.A. (Virginia Polytechnic and State 1984); Ph.D. (North Carolina 1989) [1999]
GEORGE H. SWEENEY, Associate Dean of the College of Arts and Science; Associate Professor of Economics
B.S. (Massachusetts Institute of Technology 1972); M.A., Ph.D. (Northwestern 1973, 1977) [1976]
LARRY L. SWIFT, Professor of Pathology; Director, Division of Investigative Pathology
B.S. (Indiana Central 1967); Ph.D. (Vanderbilt 1971) [1971]
JANOS SZTIPANOVITS, E. Bronson Ingram Distinguished Professor of Engineering; Professor of Electrical Engineering; Professor of Computer Engineering
Diploma, Ph.D. (Technical University of Budapest 1970, 1980) [1983]
ALAN R. TACKETT, Research Assistant Professor of Physics and Astronomy
B.S. (Henderson State 1990); M.S., Ph.D. (Wake Forest 1998) [2002]
TAKAMUNE TAKAHASHI, Assistant Professor of Medicine; Assistant Professor of Cancer Biology
M.D., Ph.D. (Jikei [Japan] 1988, 1994) [1999]
ROBERT BASIL TALISSE, Associate Professor of Philosophy
B.A. (WIlliam Paterson 1993); M.A. (New York 1995); M.Phil., Ph.D. (City University of New York 1998, 2000) [2001]
YI-WEI TANG, Associate Professor of Medicine; Associate Professor of Pathology
M.Sc., M.D. (Shanghai 1985, 1982); Ph.D. (Vanderbilt 1995) [1998]
ROBERT D. TANNER, Professor of Chemical Engineering, Emeritus
B.S.E., B.S.E., M.S.E. (Michigan 1961, 1962, 1963); Ph.D. (Case Western Reserve 1967) [1972]
C. NEAL TATE, Professor of Political Science and Chair of the Department
B.A. (Wake Forest 1965); M.A., Ph.D. (Tulane 1968, 1971) [2003]
CATHY R. TAYLOR, Assistant Professor of Nursing
B.S. (Middle Tennessee State 1976); B.S.N. (Alabama, Huntsville 1978); M.S. (Tennessee, Memphis 1989); R.N. [1991]

JOEL TELLINGHUISEN, Professor of Chemistry
B.A. (Cornell 1965); Ph.D. (California, Berkeley 1969) [1975]
HENRY A. TELOH, Professor of Philosophy; Professor of Classics
B.A. (Illinois 1967); M.A., Ph.D. (Wisconsin 1971, 1972) [1972]
STEVEN J. TEPPER, Assistant Professor of Sociology; Associate Director, Curb Center for Art, Enterprise, and Public Policy
B.A. (North Carolina 1989); M.P.P. (Harvard 1996); Ph.D. (Princeton 2001) [2004]
ANNE MARIE THARPE, Associate Professor of Hearing and Speech Sciences; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Arizona 1979); M.S., Ph.D. (Vanderbilt 1980, 1994) [1986]
JOHN J. THATAMANIL, Assistant Professor of Theology (On leave fall 2006)
B.A. (Washington University 1988); M.Div., Ph.D. (Boston University 1991, 2000) [2003]
JOHN C. THOMAS, Assistant Professor of Urologic Surgery; Assistant Professor of Pediatrics
B.S. (Xavier 1994); M.D. (University of Cincinnati College of Medicine 1998) [2006]
JAMES WARD THOMAS II, Professor of Medicine; Professor of Microbiology and Immunology; Director, Division of Rheumatology
B.A. (Southwestern at Memphis 1970); M.D. (Tennessee 1973) [1990]
PATRICK W. THOMPSON, Professor of Mathematics Education
B.Sc. (Central Washington State 1972); M.Ed., Ed.D. (Georgia 1977, 1982) [1997]
REID CARLETON THOMPSON, Associate Professor of Neurological Surgery; Associate Professor of Biomedical Engineering; Director, Section of Neurosurgical Oncology
B.A. (Maryland 1985); M.D. (Johns Hopkins 1989) [2002]
CECELIA TICHI, William R. Kenan Jr. Professor of English
B.A. (Pennsylvania State 1964); M.A. (Johns Hopkins 1965); Ph.D. (Califor nia, Davis 1968) [1987]
JEFFREY S. TLUMAK, Associate Professor of Philosophy
B.A. (City University of New York, Brooklyn College 1969); M.A., Ph.D. (Massachusetts 1972, 1975) [1973]
NORMAN H. TOLK, Professor of Physics; Director, Center for Molecular and Atomic Studies at Surfaces; Professor of Radiology and Radiological Sciences
A.B. (Harvard 1960); Ph.D. (Columbia 1966) [1984]
ANDREW J. TOMARKEN, Associate Professor of Psychology and Chair of the Department, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Harvard 1977); M.S., Ph.D. (Wisconsin 1982, 1988) [1989]
FRANK TONG, Assistant Professor of Psychology
B.S. (Queen's 1995); M.A., Ph.D. (Harvard 1998, 1999) [2004]
PATRICIA A. TRANGENSTEIN, Professor of Nursing; Assistant Professor of Biomedical Informatics
B.S.N. (Vanderbilt 1975); M.S.N. (Saint Louis 1979); Ph.D. (New York 1988); R.N. [2002]
BENIGNO TRIGO, Associate Professor of Spanish
B.A. (Amherst 1984); Ph.D. (Yale 1992) [2004]
GEORGENE L. TROSETH, Assistant Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Wyoming 1994); M.A., Ph.D. (Illinois 1997, 2000) [2000]
LORI TROXEL, Assistant Professor of Civil and Environmental Engineering
B.S. (Purdue 1984); M.S., Ph.D. (Vanderbilt 1990, 1994); P.E. [1997]
BARBARA TSAKIRGIS, Associate Professor of Classics; Chair of the Depar tment of Classical Studies; Associate Professor of Art History
B.A. (Yale 1976); M.A., Ph.D. (Princeton 1979, 1984) [1984]
IOANNIS TSAMARDINOS, Assistant Professor of Biomedical Informatics
B.Sc. (Crete [Greece] 1995); M.Sc., Ph.D. (Pittsburgh 1998, 2001) [2001]

STEVEN T. TSCHANTZ, Associate Professor of Mathematics
A.B., Ph.D. (California, Berkeley 1979, 1983) [1984]
CONSTANTINE TSINAKIS, Professor of Mathematics
B.S. (Thessalonika 1970); M.S. (Houston 1975); Ph.D. (California, Berkeley 1979) [1980]
ARLEEN M. TUCHMAN, Associate Professor of History; Director, Center for Medicine, Health, and Society
B.S. (Marlboro 1977); M.A., Ph.D. (Wisconsin 1980, 1984) [1986]
HOLLY A. TUCKER, Associate Professor of French
B.A. (Indiana 1989); M.A., Ph.D. (Wisconsin 1991, 1995) [1995]
MUSTAFA M. TUMUKLU, Visiting Scholar in Medicine
M.D. (Hacettepe [Turkey] 1996) [2006]
TIFFINY A. TUNG, Assistant Professor of Anthropology
B.A. (California, Santa Barbara 1995); M.A., Ph.D. (North Carolina 1998, 2004) [2003]
MD. JASHIM UDDIN, Research Assistant Professor of Biochemistry
B.Sc., M.S. (Dhaka 1991, 1993); Ph.D. (Shinshu 2001) [2005]
SAIT A. UMAR, Professor of Physics
B.S. (Bogazici [Turkey] 1979); M.Phil., M.S., Ph.D. (Yale 1985, 1985, 1985) [1986]
DERYA UNUTMAZ, Assistant Professor of Microbiology and Immunology
M.D. (Marmara [Turkey] 1991) [1999]
MARTINA URBAN, Assistant Professor of Religious Studies and Jewish Studies
M.A. (Freie Universität Berlin 1993); Ph.D. (Hebrew University of Jerusalem 2003) [2003]
DANIEL H. USNER, JR., Holland M. McTyeire Professor of History; Professor of History and Chair of the Department
B.A. (Johns Hopkins 1975); M.A., Ph.D. (Duke 1976, 1981) [2002]
WILLIAM M. VALENTINE, Associate Professor of Pathology
B.A. (Lakeland 1976); B.S. (Illinois 1983); Ph.D. (Illinois, Chicago 1983); D.V.M. (Illinois 1985) [1995]
PATTI PARKISON VAN EYS, Assistant Clinical Professor of Psychology, Peabody College
B.A. (DePauw 1983); M.A., Ph.D. (Bowling Green State 1985, 1989) [1995]
LUC VAN KAER, Professor of Microbiology and Immunology
Ph.D. (Rijksuniversiteit Gent 1989) [1993]
ANDREW J. VAN SCHAACK, Lecturer in Education
B.S., Ph.D. (Utah State 2002, 2004) [2004]
KÁLMÁN VARGA, Assistant Professor of Physics
Diploma, Ph.D. (Debrecen [Hungary] 1989, 1996) [2005]
DOUGLAS E. VAUGHAN, C. Sidney Burwell Professor of Medicine; Professor of Pharmacology; Director, Division of Cardiovascular Medicine
B.A. (Oklahoma 1976); M.D. (Texas Southwestern Medical School 1980) [1993]
JULIA APOSTOLOVA VELKOVSKA, Assistant Professor of Physics
M.S. (Sofia University [Bulgaria] 1988); Ph.D. (SUNY, Stony Brook 1997) [2003]
INGRID M. A. VERHAMME, Research Assistant Professor of Pathology
B.S., M.S., Ph.D. (State University of Gent [Belgium] 1977, 1980, 1986) [1999]
BART VICTOR, Cal Turner Professor of Moral Leadership (Organization Studies)
A.B. (California, Berkeley 1977); M.S. (Bank Street College of Education 1979); Ph.D. (North Carolina 1985) [1999]
W. KIP VISCUSI, University Distinguished Professor; Professor of Law; Professor of Economics; Professor of Management
A.B., M.P.P., A.M., Ph.D. (Harvard 1971, 1973, 1974, 1976) [2006]
CINDY L. VNENCAK-JONES, Associate Professor of Pathology; Associate Professor of Pediatrics
B.S. (South Carolina 1980); Ph.D. (Virginia Commonwealth 1985) [1988]

TIMOTHY J. VOGUS, Assistant Professor of Management
B.A. (Michigan State 1995); M.L.I.R. (Cornell 1999); Ph.D. (Michigan 2004) [2004]
MICHAEL W. VOLLMAN, Assistant Professor of Nursing
B.S. (Trevecca Nazarene 1981); M.S.N., Ph.D. (Vanderbilt 1994, 2003); R.N. [1996]
BRIAN E. WADZINSKI, Associate Professor of Pharmacology
B.S., Ph.D. (Wisconsin 1984, 1989) [1993]
CONRAD WAGNER, Professor of Biochemistry
M.S., Ph.D. (Michigan 1952, 1956) [1961]
LEMUEL RUSSELL WAITMAN, Assistant Professor of Biomedical Informatics
B.S. (Washington University 1990); M.S., Ph.D. (Vanderbilt 1998, 2001) [2002]
TEDRA ANN WALDEN, Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Senior Fellow, Institute for Public Policy Studies
B.A., M.A., Ph.D. (Florida 1974, 1976, 1978) [1981]
CHRISTOPH WALKER, Assistant Professor of Mathematics
Dr.Sc.nat (Zürich 2003) [2004]
GREG WALKER, Assistant Professor of Mechanical Engineering; Assistant Professor of Electrical Engineering
B.S., M.S. (Auburn 1990, 1994); Ph.D. (Virginia Polytechnic 1997) [1999]
LYNN S. WALKER, Professor of Pediatrics; Director, Division of Adolescent Medicine; Professor of Psychology, Peabody College; Associate Professor of Psychology, College of Arts and Science; Investigator, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Oberlin 1973); M.S., Ph.D. (Peabody 1978, 1981) [1982]
KENNETH A. WALLSTON, Professor of Psychology in Nursing; Professor of Psychology, Peabody College; Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
A.B. (Cornell 1964); M.A., Ph.D. (Connecticut 1965, 1968) [1971]
TAYLOR G. WANG, Centennial Professor of Materials Science and Engineering
B.S., M.S., Ph.D. (California, Los Angeles 1967, 1968, 1971) [1988]
VIVIAN OTA WANG, Adjunct Assistant Professor of Pediatrics
B.A. (Colorado College 1983); M.S. (Colorado 1988); M.Phil., Ph.D. (Columbia 1994, 1995) [2003]
PATRICIA A. WARD, Professor of French; Professor of Comparative Literature
A.B. (Eastern Nazarene 1962); M.A., Ph.D. (Wisconsin 1964, 1968) [1993]
DAVID H. WASSERMAN, Professor of Molecular Physiology and Biophysics
B.S., M.S. (California, Los Angeles 1979, 1981); Ph.D. (Toronto 1985) [1985]
DAVID J. WASSERSTEIN, Professor of History and Jewish Studies; Director of Jewish Studies
B.A., M.A., Ph.D. (Oxford 1974, 1977, 1982) [2004]
MICHAEL R. WATERMAN, Natalie Overall Warren Distinguished Professor of Biochemistry and Chair of the Department
B.A. (Willamette 1961); Ph.D. (Oregon 1969) [1992]
FRANCIS W. WCISLO, Associate Professor of History
A.B. (Michigan 1974); M.A., Ph.D. (Columbia 1977, 1984) [1984]
ALISSA M. WEAVER, Assistant Professor of Cancer Biology; Assistant Professor of Pathology
B.S./B.A. (Stanford 1991); Ph.D., M.D. (Virginia 1997, 1998) [2003]
DONNA JANE WEBB, Assistant Professor of Biological Sciences; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S. (James Madison 1989); Ph.D. (Virginia 1995) [2005]

GLENN F. WEBB, Professor of Mathematics
B.S. (Georgia Institute of Technology 1965); M.S., Ph.D. (Emory 1966, 1968) [1968]
WANDA G. WEBB, Assistant Professor of Speech (Language Pathology); Assistant Professor of Neurology
B.S. (Middle Tennessee State 1970); M.S. (Eastern Illinois 1971); Ph.D. (Vanderbilt 1979) [1978]
EDWIN JOHN WEEBER, Assistant Professor of Molecular Physiology and Biophysics; Member, Vanderbilt Kennedy Center for Research on Human Development
B.S., Ph.D. (New Mexico 1993, 1998) [2004]
JOSEPH H. WEHBY, Associate Professor of Special Education; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Memphis State 1982); M.Ed., Ph.D. (Vanderbilt 1987, 1990) [1990]
P. ANTHONY WEIL, Professor of Molecular Physiology and Biophysics
B.S. (Northern Illinois 1972); Ph.D. (Texas Health Science Center, Houston 1976) [1986]
THOMAS JOSEPH WEILER, Professor of Physics
B.S. (Stanford 1971); Ph.D. (Wisconsin 1976) [1984]
STUART TOBE WEINBERG, Assistant Professor of Biomedical Informatics
B.S. (Dartmouth 1981); M.D. (Cincinnati 1985) [2004]
ELIZABETH E. WEINER, Senior Associate Dean for Educational Informatics, School of Nursing; Professor of Nursing; Professor of Biomedical Informatics
B.S.N. (Kentucky 1975); M.S.N. (Cincinnati 1978); Ph.D. (Kentucky 1982); R.N. [2000]
DAVID A. WEINTRAUB, Professor of Astronomy; Director, Science, Humanities, and Technology
B.S. (Yale 1980); M.S., Ph.D. (California, Los Angeles 1982, 1989) [1991]
BAHR WEISS, Associate Professor of Psychology, Peabody College; Investigator, Vanderbilt Kennedy Center for Research on Human Development; Co-Director, Center for Psychotherapy Research and Policy, Institute for Public Policy Studies
A.B. (Michigan 1974); Ph.D. (North Carolina 1988) [1988]
SHARON M. WEISS, Assistant Professor of Electrical Engineering; Assistant Professor of Physics
B.S., M.S., Ph.D. (Rochester 1999, 2001, 2005) [2005]
D. DON WELCH, JR., Associate Dean for Administration, Law School; Professor of Law; Professor of Religion
B.A. (Baylor 1969); M.A., Ph.D. (Vanderbilt 1975, 1976) [1984]
GAY HOUSE WELCH, University Chaplain; Assistant Professor of Religious Studies
B.A. (Southwestern at Memphis 1970); M.A., Ph.D. (Vanderbilt 1976, 1980) [1990]
ROBERT A. WELLER, Professor of Electrical Engineering; Professor of Physics; Professor of Materials Science and Engineering
B.S. (Tennessee 1971); Ph.D. (California Institute of Technology 1978) [1987]
FRANCIS M. WELLS, Professor of Electrical Engineering, Emeritus
B.E., M.S., Ph.D. (Vanderbilt 1965, 1967, 1970); P.E. [1969]
NANCY L. WELLS, Research Professor of Nursing; Director of Nursing Research, Vanderbilt University Medical Center
B.A., B.S.N. (Windsor 1976, 1976); M.N. (University of Washington 1981); D.N.Sc. (Boston University 1988); R.N. [1992]
QUAN WEN, Professor of Economics
B.Sc. (Jilin [China] 1985); M.A., Ph.D. (Western Ontario 1988, 1991) [2001]
SUSAN RAE WENTE, Professor of Cell and Developmental Biology and Chair of the Department
B.S. (Iowa 1984); Ph.D. (California, Berkeley 1988) [2002]

MEIKE G. J. WERNER, Associate Professor of German
M.A. (Washington University 1980); Staatsexamen (Tübingen [Germany] 1984); M.Phil., Ph.D. (Yale 1991, 1995) [1997]
STEVEN A. WERNKE, Assistant Professor of Anthropology
B.A. (Iowa 1992); M.A., Ph.D. (Wisconsin 1996, 2003) [2005]
ROBERT T. WERTZ, Professor of Hearing and Speech Sciences, Emeritus
A.B. (Long Beach State 1959); A.M., Ph.D. (Stanford 1964, 1967) [1992]
DIANA N. WEYMARK, Assistant Professor of Economics
B.A., M.A. (Dalhousie 1978, 1980); Ph.D. (British Columbia 1990) [1999]
JOHN WEYMARK, Professor of Economics
B.A. (British Columbia 1972); M.A., Ph.D. (Pennsylvania 1973, 1977) [1999]
ROBERT WHITEHEAD, Research Professor of Medicine; Research Professor of Cell and Developmental Biology; Research Professor of Cancer Biology
B.Sc. (Queensland 1965); M.Sc. (Queensland [Australia] 1968); Ph.D. (Wales 1975) [1999]
DONNA C. WHITNEY, Assistant Professor of Clinical Pediatrics
B.S. (San Diego State 1988); M.D. (Uniformed Services 1992) [2006]
JOHN P. WIKSWO, JR., Gordon A. Cain University Professor; A. B. Learned Professor in Living State Physics; Professor of Physics; Professor of Biomedical Engineering; Professor of Molecular Physiology and Biophysics
B.A. (Virginia 1970); M.S., Ph.D. (Stanford 1973, 1975) [1977]
RONALD G. WILEY, Professor of Neurology; Professor of Pharmacology
B.S., M.D., Ph.D. (Northwestern 1972, 1975, 1975) [1982]
D. MITCHELL WILKES, Associate Professor of Electrical Engineering; Associate Professor of Computer Engineering
B.S.Eng. (Florida Atlantic 1981); M.S., Ph.D. (Georgia Institute of Technology 1984, 1987) [1987]
GRANT R. WILKINSON, Professor of Pharmacology (Died 13 June 2006)
B.Sc. (Manchester [England] 1963); Ph.D. (London 1966); D.Sc. (Manchester [England] 2002) [1971]
SCOTT MATTHEW WILLIAMS, Associate Professor of Medicine; Associate Professor of Pediatrics; Associate Professor of Molecular Physiology and Biophysics
A.B. (Chicago 1976); Ph.D. (Washington University 1981) [1999]
KEITH T. WILSON, Professor of Medicine; Professor of Cancer Biology
B.A. (Cornell 1982); M.D. (Harvard 1986) [2005]
SUSAN FORD WILTSHIRE, Professor of Classics
B.A. (Texas 1963); M.A., Ph.D. (Columbia 1964, 1967) [1971]
DANNY G. WINDER, Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (North Georgia College and State University 1990); Ph.D. (Emory 1995) [1999]
JAMES E. WITTIG, Associate Professor of Materials Science and Engineering; Associate Director of Interdisciplinary Graduate Program in Materials Science
B.S. (Wisconsin, Milwaukee 1978); M.S., Ph.D. (Stanford 1980, 1985) [1987]
ARTHUR F. WITULSKI, Research Associate Professor of Electrical Engineering
B.S., M.S., Ph.D. (Colorado, Boulder 1981, 1986, 1988) [2006]
MARK WOLERY, Professor of Special Education; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Tennessee Temple 1969); M.Ed. (Virginia Commonwealth 1975); Ph.D. (University of Washington 1980) [2000]
MARK A. WOLLAEGER, Associate Professor of English
A.B. (Stanford 1979); M.Phil., Ph.D. (Yale 1984, 1986) [1994]

CHRISTOPHER E. WOLTER, Instructor in Urologic Surgery
B.S. (Illinois, Urbana-Champaign 1997); M.D. (Illinois, Rockford 2001) [2006]
KENNETH K. WONG, Professor of Public Policy and Education; Associate Director, Peabody Center for Education Policy; Professor of Political Science
B.A., M.A., Ph.D. (Chicago 1977, 1980, 1993) [2001]
DAVID CHARLES WOOD, Professor of Philosophy
B.A. (Manchester [England] 1968); Ph.D. (Warwick 1985) [1994]
MYRNA HOLTZ WOODERS, Professor of Economics
B.A. (Alberta 1969); Ph.D. (Minnesota 1976) [2004]
CHRISTOPHER V. E. WRIGHT, Molecular Diabetes Research Professor of Cell and Developmental Biology
B.Sc. (Warwick 1980); D.Phil. (Oxford 1984) [1990]
DAVID W. WRIGHT, Assistant Professor of Chemistry
B.A., B.S. (Tulane 1988); Ph.D. (Massachusetts Institute of Technology 1993) [2001]
NICHOLAS JOHN WRIGHT, Assistant Professor of Mathematics
Ph.D. (Pennsylvania State 2002) [2002]
PETER F. WRIGHT, Professor of Pediatrics; Professor of Microbiology and Immunology; Professor of Pathology; Director, Division of Pediatric Infectious Diseases
B.A. (Dartmouth 1964); M.D. (Harvard 1967) [1974]
EDWARD WRIGHT-RIOS, Assistant Professor of History
B.S. (Illinois 1987); M.A. (Vanderbilt 1998); Ph.D. (California, San Diego 2004) [2004]
DAOXING XIA, Professor of Mathematics
Undergraduate (Sangton 1950); Graduate (Jijian 1952) [1984]
BAOGANG JONATHAN XU, Research Assistant Professor of Cancer Biology
B.S. (Lee 1999); Ph.D. (Vanderbilt 2005) [2005]
LUOYU ROY XU, Assistant Professor of Civil and Environmental Engineering
B.S., M.S. (Beijing University of Aeronautics and Astronautics 1987, 1991); Ph.D. (California Institute of Technology 2001) [2001]
YUAN (EMILY) XUE, Assistant Professor of Computer Science; Assistant Professor of Computer Engineering
B.S. (Harbin Institute of Technology [China] 1998); M.S., Ph.D. (Illinois 2002, 2005) [2005]
ELIZABETH YANG, Associate Professor of Pediatrics; Associate Professor of Cell and Developmental Biology; Associate Professor of Cancer Biology
A.B., M.S. (Chicago 1980, 1980); M.D., Ph.D. (Stanford 1987, 1987) [1997]
THOMAS E. YANKEELOV, Assistant Professor of Radiology and Radiological Sciences; Assistant Professor of Biomedical Engineering; Assistant Professor of Physics
B.A. (Louisville 1996); M.A., M.S. (Indiana University 1998, 2000); Ph.D. (SUNY, Stony Brook 2003) [2005]
WENDELL GRAY YARBROUGH, Associate Professor of Otolaryngology; Associate Professor of Cancer Biology
A.B., M.D. (North Carolina 1985, 1989) [2003]
JU-YI J. YEN, Assistant Professor of Mathematics
B.S. (Pacific Union 1995); M.A., Ph.D. (Maryland 2000, 2004) [2006]
PAUL J. YODER, Professor of Special Education; Investigator, Vanderbilt Kennedy Center for Research on Human Development
B.S. (Louisiana State 1978); M.S. (Peabody 1979); Ph.D. (North Carolina 1985) [1987]

PAMPEE PAUL YOUNG, Assistant Professor of Pathology; Assistant Professor of Medicine
B.A. (Rice 1990); Ph.D., M.D. (Texas, Southwestern 1996, 1998) [2003]
PAUL YOUNG, Assistant Professor of English; Director, Film Studies
B.A. (Iowa 1990); M.A., Ph.D. (Chicago 1992, 1998) [2003]
CHAO-LAN YU, Assistant Professor of Molecular Physiology and Biophysics
B.S. (Taipei Medical 1985); Ph.D. (Michigan 1995) [2001]
GUOLIANG YU, Professor of Mathematics
Ph.D. (SUNY, Stony Brook 1991) [2000]
FIONA ELIZABETH YULL, Assistant Professor of Cancer Biology
B.Sc. (Saint Andrews [Scotland] 1985); D.Phil. (Oxford [England] 1989) [1998]
ALEXANDER ZAIKA, Assistant Professor of Surgery
B.S., M.S. (Petersburg State 1983, 1986); Ph.D. (University of Chemical Technology 1995) [2005]
DAVID H. ZALD, Assistant Professor of Psychology, College of Arts and Science; Member, Vanderbilt Kennedy Center for Research on Human Development
B.A. (Michigan 1989); Ph.D. (Minnesota 1997) [2000]
ANDRES ZAMORA, Associate Professor of Spanish
B.A. (Universidad Complutense de Madrid 1984); M.A. (Auburn 1986); Ph.D. (Southern California 1994) [1998]
DAVID L. ZEALEAR, Associate Professor of Otolaryngology
B.S. (California, Davis 1970); Ph.D. (California, San Francisco 1979) [1986]
CHRISTOPH ZELLER, Assistant Professor of German
M.A., Dr. phil. (Stuttgart 1995, 1998) [2004]
ROY ZENT, Assistant Professor of Medicine; Assistant Professor of Cancer Biology; Assistant Professor of Cell and Developmental Biology
Ph.D. (Toronto 1997); M.D. (Witwatersrand [South Africa] 1984) [2000]
DECHAO ZHENG, Associate Professor of Mathematics
B.S. (Chongqing [China] 1982); M.S. (Sichuan [China] 1985); Ph.D. (SUNY, Stony Brook 1992) [1996]
TAO PETER ZHONG, Assistant Professor of Medicine; Assistant Professor of Cell and Developmental Biology; Assistant Professor of Pharmacology
B.S. (Shanghai Medical 1987) [2001]
SANDRA S. ZINKEL, Professor of Medicine
B.S. (Indiana University 1982); Ph.D. (Yale 1989); M.D. (Chicago 1995) [2005]
BENJAMIN C. ZISSIMOS, Assistant Professor of Economics
B.Sc. (London School of Economics and Political Science 1992); M.Sc., Ph.D. (Warwick [England] 1993, 2003) [2003]
MARY M. ZUTTER, Professor of Pathology; Professor of Cancer Biology; Director, Division of Hematopathology
B.S., M.D. (Tulane 1976, 1981) [2003]
LAURENCE J. ZWIEBEL, Professor of Biological Sciences
B.S. (SUNY, Stony Brook 1980); M.S. (Michigan 1982); Ph.D. (Brandeis 1992) [1997]

Index

4+1, B.A./M.A. program 36
Academic probation 60
Academic programs 31
Academic regulations 51
Academic requirements 51
Accident and sickness insurance 22, 41, 44
Accounting 200, 202
Accreditation 8, 34
Activities fee 44, 45
Address change 18, 21
Administration, Graduate School 347
Administration, Vanderbilt 345
Admission requirements 33, 35, 37, 39
Admission to candidacy 54
Anthropology 64
Appeals, grievances 20, 60
Application fee 39
Application procedure 39
Arabic courses 71, 272
Archaeology—see Anthropology, Classical Studies 64, 110
Art History 178
Assistantships 10, 11, 47
Astronomy 244, 251
Athletic program, report on 19
Audiology, Doctorate of 163
Auditing 44, 59
Awards 47

B.A./M.A. (4+1) program 36
Bicycle registration 26
Bill Wilkerson Center 9, 163
Binding, thesis and dissertation 44, 57
Biochemistry 72
Biological Sciences 75
Biomedical Engineering 80
Biomedical Informatics 84
Biomedical Sciences, Interdisciplinary Graduate Program in 87
Biophysics—see Molecular Physiology and Biophysics, Physics and Astronomy 225, 244
Bishop Joseph Johnson Black Cultural Center 26
Board of Trust 344
Branscomb, Harvie, Distinguished Professor Award 348
Buckley Amendment 19

Calendar 6
Campus Security Report 25
Cancer Biology 88
Candidacy 54, 56
Career Center 21
Carpenter Certificate 272
Cell and Developmental Biology 90
Cellular and Molecular Pathology 94
Centennial Professorships 354
Center for Environmental Management Studies 151
Center for Latin American and Iberian Studies 12, 33, 189
Center for Teaching 10
Centers, interdisciplinary 11
Changes in registration 58
Changing a grade 59
Chaplain 28
Chemical and Physical Biology 96
Chemical Engineering 97
Chemistry 101
Child Care Center 23
Chinese 105
Civil Engineering 105, 148
Classical Studies 110
Classics courses 113
Commencement 62
Commencement, deadlines for 62
Commodore Card 18
Community Research and Action 115
Comparative Literature 117
Computer resources 10
Computer Science 121
Conduct Council, Graduate Student 51
Confidentiality of student records 19
Continuous registration 43, 55, 58
Copyright, dissertation 44, 56
Counseling Center 21
Course work in other Vanderbilt schools 35
Course work requirements 52, 53, 54
Courses 63
Creative writing, M.F.A. 33, 145
Credit 60
Crime statistics 25
Curriculum, M.L.A.S. 54

Deferred payment 45
Deficiency 52
Degree requirements 51, 52, 53, 54
Degrees awarded by Graduate School 31, 32, 52
Degrees awarded by university 8
Digital Life initiative 10
Dining 18
Directory listings 21
Disabilities, services for students with 23
Dissertation Abstracts 57
Dissertation copyright 44, 56
Dissertation defense 57
Dissertation, M.D./Ph.D. 35

Dissertation publishing and binding 44, 57
Dissertation requirement for Ph.D. 56
Dissertation research hours 43, 44, 54, 55
Distinguished professorships and chairs 351
Division of Unclassified Studies, transferring courses from 61

Earth and Environmental Sciences 128
East Asian Studies 130
Eating on campus 18
Economic development, program in 32, 132
Economics 131, 132, 200, 202
Education courses 334
Education records 19
Electrical Engineering 139
Emergency medical care 22
Emergency telephones 25
English 145
English education courses 338
English instruction 40
English Language Center 40
English language proficiency 40
Enrollment 7, 8
Environmental Engineering 147, 149
Environmental Management 151
Environmental Sciences, Earth and 128
Equity in Athletics Disclosure Act Report 19
Escort service 24
Examinations 53, 55
Expenses 44
Extension of candidacy 56
Extracurricular activities 29

Facilities 8
Faculty 355
Faculty Council 347
Family Educational Rights and Privacy Act (FERPA) 19
Family insurance coverage 23
Fees 43, 44, 45, 46
Fellowships 46, 47, 48
Final examination 53, 57
Finance 200, 203
Financial aid 19, 58
Financial clearance 45
Financial information 43
Financial resources, international students 41
Food services 18
Foreign language education courses 340
Foreign language requirements 57
Formal didactic course work 54, 63
Free Application for Federal Student Aid (FAFSA) 49
French courses 153
French and Italian 152
Full-time status 44, 58

Gay, Lesbian, Bisexual, and Transgendered Life, Office for 28
Gender studies—see Women's and Gender Studies 343
Geology—see Earth and Environmental Sciences 128
German courses 157
Germanic and Slavic Languages 155
GPA for graduation 59
Grade change policy 59
Grading system 59
GradSTEP 11
Graduate credit earned as undergraduate 62
Graduate faculty 355
Graduate Faculty Council 347
Graduate Honor Council 51
Graduate PLUS Loan program 48
Graduate Record Examination (GRE) 39
Graduate School history and statistics 7
Graduate Student Conduct Council 51
Graduate Student Council 17
Graduate Student Professional and Personal Development Collaborative 26
Graduate Teaching Fellows and Teaching Affiliates program 11
Graduation rates 19
Greek courses 110, 272, 273
Grievances and appeals 20, 60

Half-time students 44, 58
Harold Stirling Vanderbilt scholarships 46
Health insurance 22, 41, 44
Health services 22
Heard, Jean and Alexander, Library 9
Heard, Alexander, Distinguished Service Professor Award 349
Hearing and Speech Sciences 162
Hebrew courses 272, 273
Help Desk, ITS 10
Hillel 28
History 170
History of Art 178
History, Graduate School 7
Honors held by university faculty 348
Honor scholarships 46
Honor System 51
Hospitalization insurance 22, 41, 44
Housing for graduate students 17
Human Genetics 181

I (Incomplete) 59
Identification cards 18
Immunology—see Microbiology and Immunology 222
Individualized programs 36
Information about the university 18

Information Technology Services 10
Information technology courses 205
Ingram, E. Bronson, Studio Arts Center 9
Insurance 22, 41, 44
Integrated B.A./M.A. (4+1) program 36
Intent to graduate, notification of 52
Interdisciplinary centers, institutes, and initiatives 11
Interdisciplinary Graduate Program in Biomedical Sciences 87
Interdisciplinary Materials Science 183
Interdisciplinary Social and Political Thought 188
International Student and Scholar Services 27, 40, 52
International students 23, 27, 40, 52, 58
International Teaching Assistant Program (ITAP) 11
Internet access 10

Japanese 188
Jewish Life, Schulman Center for 28
Jewish studies—see Religion 269
Joint M.A. in Latin American Studies and LL.M. 35
Joint M.A. in Latin American Studies and M.B.A. 33, 190
Joint M.A. in religion and J.D. 271

Laboratories 9
Language requirements 57
Late payment of fees 45
Late registration 44, 58
Latin courses 111
Latin American and Iberian Studies 12, 33, 189
Leadership and Policy Studies 192
Learned, A. B., Laboratories 9
Leave of absence 61
Liberal arts and science, master of 34, 40, 43, 53, 199
Libraries 9
Licensure for teaching 34
Loan programs 48

Management 200
Margaret Cuninggim Women's Center 27
Marketing courses 206
Master of arts in Latin American Studies and LL.M., joint 35
Master of arts in Latin American Studies and M.B.A., joint 33, 190
Master of arts in religion and J.D., joint 271
Master of arts in teaching 33, 48
Master of fine arts in creative writing 33, 145
Master of liberal arts and science 34, 40, 43, 53, 199
Master's degree in passing 53
Master's degree requirements 52
Master's degrees offered 31, 32, 52
Master's research, registration for 58
Materials Science 183
Mathematics 211
Mathematics education courses 341
Mechanical Engineering 218
Medical and Health Physics 244, 249
Medical Scientist Training Program (M.D./Ph.D. program) 35
Microbiology and Immunology 222
Microfilming of dissertation 44, 56
Minimum tuition charge 55
Minor subjects 32, 36, 52, 54
Molecular Biology—see Biological Sciences 75
Molecular Physiology and Biophysics 225

Named professorships and chairs 351
National Association of Graduate and Professional Students 17
Neuroscience 229
Non-credit courses 60
Non-degree students 61
Non-thesis master's degree programs 53
Nursing Science 233

OAK 10
OASIS 10, 58
Office for GLBT Life 28
Operations courses 208
Opportunity Development Center 23
Organization studies courses 209
Orientation, TA 11

Parking on campus 26
Part-time students 34, 46, 58
Pass/Fail 59
Pathology—see Cellular and Molecular Pathology 94
Payment of tuition and fees 44
PeopleFinder directory 21
Perkins Loan program 48
Pharmacology 237
Ph.D. committee 54, 55
Ph.D. degree requirements 54
Ph.D. degrees offered 31, 32
Ph.D. research, registration for 43, 44, 54, 55, 58
Philosophy 240
Physics courses 245
Physics and Astronomy 244
Physiology—see Molecular Physiology and Biophysics 225
Police Department 24
Political Science 252
Portuguese courses 320, 325
Privacy of records 19

Probation, academic 60
Professional degree courses 35
Provost's Graduate Fellowships 46
Psychological and Counseling Center 21
Psychology 259
Psychology and Human Development 264

Qualifying examination for Ph.D. degree 55

Readmission 56
Recreation and sports 29
Recreation Center 30, 45
Recreation fee 44, 45
Refunds, tuition 44
Registration 43, 58
Reinstatement 44, 61
Religion 269
Religion, gender, and sexuality certificate 272
Religious life 28
Repeated courses 59
Requirements for master's degree 52
Requirements for M.L.A.S. degree 53
Requirements for Ph.D. degree 54
Research assistantships 47
Residence requirements 52, 54
ResNet 10
Russian courses 155, 161

Sarratt Student Center 29, 45
Scholarships 46
Schulman Center for Jewish Life 28
Science education courses 342
Security, campus 19, 25
Services to students 19
Social Psychology 313
Social studies education courses 342
Sociology 314
Spanish courses 321
Spanish and Portuguese 320
Special Education 327
Special programs 32
Special students 61
Sports and recreation 29
Spring semester, admission for 39
Stafford Loan program 48
Statistics courses 210
Stevenson Center 9
Student Handbook 4, 20, 46
Student Health Center 22
Student Life Center 29
Student records 19
Student Recreation Center 30, 45
Student status 43, 58
Studio Arts Center 9
Summer session 38
Supplemental tuition 43
Sutherland, Earl, Prize for Achievement in Research 350
Symbols, explanation of 63

Teacher education 33
Teacher training awards 48
Teaching and Learning 334
Teaching assistantships 10, 11, 47
Teaching certificate program, CFT 11
Teaching, master of arts in 33, 48
Telephone services 10
Test of English as a Foreign Language (TOEFL) 40
Theology—see Religion 269
Thesis requirements for master's degree 52
Time limit for degree completion 53
Time limit for dissertation completion 56
Time limit for taking qualifying examination 55
Traineeships 48
Transcripts 44, 45, 46
Transfer credit 52, 53, 54, 58, 61, 62
Transfer students 43, 61
Transient students 61
Transinstitutional initiatives 11
Tuition 43
Tuition payment programs 45
Tuition scholarships 48

Undergraduate, credit for graduate courses taken as 62
University, the 7
University fellowships 47
University graduate fellowships 46
University Professorships 351

Vandy Vans 24
Vehicle registration 26
VUmail 10
VUmix 10
VUnet 10
VUspace 10

Waiver of fees 46
Waiver of insurance 23
W grade notation 58, 59
Wilkerson Center 9, 163
Withdrawal from courses 58
Withdrawal from the university 44, 62
Women's Center 27
Women's and Gender Studies 343
Wyatt, Joe B., Distinguished University Professor Award 351

Zerfoss Student Health Center 22

PHOTOGRAPHS by Neil Brake, Daniel Dubois, Jeremy Teaford