



School of Medicine Catalog

Vanderbilt
University
2016/2017

Archived 2016/2017
School of Medicine Catalog

Containing general information
and courses of study
for the 2016/2017 session
corrected to August 2016
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 time or part time, who are enrolled in Vanderbilt courses are subject to the same policies.

Policies concerning noncurricular matters and concerning withdrawal for medical or emotional reasons can be found in the *Student Handbook*, which is on the Vanderbilt website at vanderbilt.edu/student_handbook.

NONDISCRIMINATION STATEMENT

In compliance with federal law, including the provisions of Title VII of the Civil Rights Act of 1964, Title IX of the Education Amendment of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990, the ADA Amendments Act of 2008, Executive Order 11246, the Uniformed Services Employment and Reemployment Rights Act, as amended, and the Genetic Information Nondiscrimination Act of 2008, Vanderbilt University does not discriminate against individuals on the basis of their race, sex, religion, color, national or ethnic origin, age, disability, military service, or genetic information in its administration of educational policies, programs, or activities; admissions policies; scholarship and loan programs; athletic or other university-administered programs; or employment. In addition, the university does not discriminate against individuals on the basis of their sexual orientation, gender identity, or gender expression consistent with the university's nondiscrimination policy. Inquiries or complaints should be directed to the Equal Opportunity, Affirmative Action, and Disability Services Department, Baker Building, PMB 401809, 2301 Vanderbilt Place, Nashville, TN 37240-1809. Telephone (615) 322-4705 (V/TDD); Fax (615) 343-4969.

Vanderbilt®, Vanderbilt University®, V Oak Leaf Design®, Star V Design® and Anchor Down® are trademarks of The Vanderbilt University.
© 2016 Vanderbilt University. All rights reserved.

The text of this catalog is printed on recycled paper with ink made from renewable resources.



This publication is recyclable. Please recycle it.

Contents

| | |
|--|------------|
| Calendar | 4 |
| Administration | 5 |
| Vanderbilt University | 10 |
| Life at Vanderbilt | 11 |
| Medical Education at Vanderbilt | 21 |
| Admission | 32 |
| Academic Program and Policies | 42 |
| Honors and Awards | 63 |
| Financial Information | 65 |
| Courses of Study | 76 |
| Faculty | 115 |
| Index | 116 |

Archived 2016/2017
School of Medicine Catalog

School of Medicine Calendar 2016/2017

FALL SEMESTER 2016

Classes begin for 3rd- and 4th-year M.D. students / Monday 5 July
Classes continue for 2nd-year M.D. students / Friday 1 July
Orientation/Registration for 1st-year M.D. students / Wednesday 20 July–Friday 22 July
Classes begin for 1st-year M.D. students / Monday 25 July
Fall semester begins for VUSM master's and doctoral programs (other than M.D.) / Wednesday 24 August
Labor Day—No M.D. classes or clinical activities / Monday 5 September
Fall break for VUSM master's and doctoral programs (other than M.D.) / Thursday 13 October–Sunday 16 October
Fall break for 1st-year medical students / Saturday 22 October–Tuesday 25 October
Thanksgiving holiday for VUSM master's and doctoral programs (other than M.D.) / Saturday 19 November–Sunday 27 November
Thanksgiving holiday for all M.D. students / Thursday 24 November–Sunday 27 November
Fall semester ends for all VUSM master's and doctoral programs (other than M.D.) / Thursday 8 December
Holiday break for all VUSM master's and doctoral programs (other than M.D.) / Sunday 18 December–Sunday 8 January, 2017
Fall semester ends for all M.D. students / Friday 16 December
Holiday break for all Medical School classes / Saturday 17 December–Monday 2 January 2017

SPRING SEMESTER 2017

Classes begin for all M.D. students / Tuesday 3 January
Spring semester begins for VUSM master's and doctoral programs (other than M.D.) / Monday 9 January
Martin Luther King Jr. Day—No class or clinical activities / Monday 16 January
Spring break for 2nd-year M.D. students / Saturday 25 February–Sunday 5 March
Spring break for VUSM master's and doctoral programs (other than M.D.) / Saturday 4 March–Sunday 12 March
Spring break for 1st-year M.D. students / Saturday 29 April–Sunday 7 May
Spring semester ends for VUSM master's and doctoral programs (other than M.D.) / Thursday 27 April
Instruction ends for 4th-year M.D. students / Friday 28 April
Commencement / Friday 12 May
Memorial Day—No class or clinical activities / Monday 29 May
Summer break for 1st-year M.D. students / Saturday 29 July–Sunday 20 August

SUMMER SESSION 2017

May term begins for VUSM master's and doctoral programs (other than M.D.) / Monday 8 May
May term ends for VUSM master's and doctoral programs (other than M.D.) / Friday 2 June
Full summer term begins for VUSM master's and doctoral programs (other than M.D.) / Tuesday 6 June
Full summer term ends for VUSM master's and doctoral programs (other than M.D.) / Friday 11 August

Archive 2016/2017
School of Medicine Catalog

Vanderbilt University Board of Trust

MARK F. DALTON, Chairman of the Board, Scarsdale, NY
JACKSON W. MOORE, Vice Chairman, Memphis, TN
JON WINKELRIED, Vice Chairman, San Francisco, CA
SHIRLEY M. COLLADO, Secretary, Rutgers, NJ
NICHOLAS S. ZEPPOS, Chancellor of the University, Nashville, TN

GREG S. ALLEN
Charlottesville, VA

LEE M. BASS
Fort Worth, TX

ADOLPHO A. BIRCH III
West New York, NJ

DANIEL M. CROWN
New York, NY

CLAIBORNE P. DEMING
El Dorado, AR

CHARLES H. ESSERMAN
Orinda, CA

BRUCE R. EVANS
Boston, MA

DAVID W. HEAD
Charlotte, NC

JAY C. HOAG
Atherton, CA

JOHN R. INGRAM
Nashville, TN

KATHLEEN F. JUSTICE-MOORE
Palo Alto, CA

CARROLL E. KIMBALL
Nashville, TN

STEVEN H. MADDEN
Houston, TX

MARK P. MAYS
San Antonio, TX

COURTNEY C. PASTRICK
Bethesda, MD

DAVID W. PATTERSON, M.D.
Great Falls, VA

ROSS PEROT, JR.
Plano, TX

JEFFREY J. ROTHSCHILD
Los Altos, CA

SID SAPRU
Dallas, TX

ROBERT C. SCHIFF, JR., M.D.
Cincinnati, OH

ALEXANDER C. TAYLOR, JR.
Atlanta, GA

J. STEPHEN TURNER
Nashville, TN

PATRICIA EARLY WHITE
Mayfair, England

MARK WILF
Livingston, NJ

Emerita/Emeritus Trustees

MARY BETH ADDERLEY
La Jolla, CA

MICHAEL L. AINSLIE
Palm Beach, FL

WILLIAM W. BAIN, JR.
Naples, FL

DARRYL D. BERGER
New Orleans, LA

CAMILLA DIETZ BERGERON
New York, NY

DENNIS C. BOTTORFF
Nashville, TN

LEWIS M. BRANSCOMB
La Jolla, CA

THOMAS F. CONE
Nashville, TN

CECIL D. CONLEE
Atlanta, GA

BROWNLEE O. CURREY, JR.
Nashville, TN

FRANK A. GODCHAUX III
Houston, TX

JOHN R. HALL
Lexington, KY

L. HALL HARDAWAY, JR.
Nashville, TN

H. RODES HART
Brentwood, TN

JOANNE F. HAYES
Gulf Stream, FL

MARTHA R. INGRAM
Nashville, TN

J. HICKS LANIER
Atlanta, GA

EDWARD A. MALLOY, C.S.C.
Notre Dame, IN

KENNETH L. ROBERTS
Nashville, TN

JOE L. ROBY
New York, NY

EUGENE B. SHANKS, JR.
Greenwich, CT

RICHARD H. SINKFIELD
Atlanta, GA

CAL TURNER
Franklin, TN

EUGENE H. VAUGHAN
Houston, TX

THOMAS B. WALKER, JR.
Dallas, TX

DUDLEY BROWN WHITE
Nashville, TN

W. RIDLEY WILLS II
Nashville, TN

J. LAWRENCE WILSON
Bonita Springs, FL

REBECCA WEBB WILSON
Memphis, TN

WILLIAM M. WILSON
Nashville, TN

MARIBETH GERACIOTI, Secretary to the Board of Trust

Vanderbilt University Administration

NICHOLAS S. ZEPPOS, J.D., Chancellor
SUSAN R. WENTE, Ph.D., Provost and Vice Chancellor for Academic Affairs
AUDREY J. ANDERSON, J.D., Vice Chancellor, General Counsel, and Secretary of the University
BETH A. FORTUNE, M.A., Vice Chancellor for Public Affairs
ANDERS W. HALL, M.B.A., Vice Chancellor for Investments and Chief Investment Officer
GEORGE C. HILL, Ph.D., Vice Chancellor for Equity, Diversity, and Inclusion and Chief Diversity Officer
ERIC C. KOPSTAIN, M.B.A., Vice Chancellor for Administration
JOHN M. LUTZ, A.B., Vice Chancellor for Information Technology
SUSIE S. STALCUP, B.B.A., C.F.P., Vice Chancellor for Development and Alumni Relations
BRETT SWEET, M.B.A., Vice Chancellor for Finance and Chief Financial Officer
DAVID WILLIAMS II, J.D., LL.M., M.B.A., Vice Chancellor for Athletics and University Affairs and Athletics Director

Deans

JEFFREY R. BALSER, M.D., Ph.D., Dean of the School of Medicine
MARK D. BANDAS, Ph.D., Associate Provost and Dean of Students
VANESSA BEASLEY, Ph.D., Dean of The Martha Rivers Ingram Commons
CAMILLA PERSSON BENBOW, Ed.D., Dean of Peabody College
LAUREN A. BENTON, Ph.D., Dean of the College of Arts and Science
DOUGLAS L. CHRISTIANSEN, Ph.D., Vice Provost for University Enrollment Affairs and Dean of Admissions and Financial Aid
PHILIPPE M. FAUCHET, Ph.D., Dean of the School of Engineering
CHRIS GUTHRIE, J.D., Dean of the Law School
M. ERIC JOHNSON, Ph.D., Dean of Owen Graduate School of Management
LINDA D. NORMAN, D.S.N., Dean of the School of Nursing
EMILIE M. TOWNES, Ph.D., Dean of the Divinity School
MARK WAIT, D.M.A., Dean of Blair School of Music
MARK T. WALLACE, Ph.D., Dean of the Graduate School

Archived 2016/2017
School of Medicine Catalog

School of Medicine Administration

JEFFREY R. BALSER, M.D., Ph.D., Dean, School of Medicine
 LAWRENCE J. MARNETT, Ph.D., Dean of Basic Sciences
 BONNIE M. MILLER, M.D., Senior Associate Dean for Health Sciences Education
 GORDON R. BERNARD, M.D., Senior Associate Dean for Clinical Research
 DONALD W. BRADY, M.D., Senior Associate Dean for Graduate Medical Education and Continuing Professional Development
 G. ROGER CHALKLEY, D.Phil., Senior Associate Dean for Biomedical Research, Education, and Training
 ANDRÉ L. CHURCHWELL, M.D., Senior Associate Dean for Diversity Affairs
 ROBERT S. DITTUS, M.D., M.P.H., Senior Associate Dean for Population Health Sciences
 JOHN F. MANNING, JR., Ph.D., Senior Associate Dean for Operations and Administration
 C. WRIGHT PINSON, M.D., Senior Associate Dean for Clinical Affairs
 DAVID S. RAIFORD, M.D., Senior Associate Dean for Faculty Affairs
 WILLIAM COOPER, M.D., M.P.H., Associate Dean for Faculty Affairs
 AMY E. FLEMING, M.D., Associate Dean for Medical Student Affairs
 KATHLEEN GOULD, Ph.D., Associate Dean for Biomedical Sciences and Director, Office of Graduate Student Support
 KATHERINE E. HARTMANN, M.D., Associate Dean for Clinical and Translational Scientist Development
 KIMBERLY D. LOMIS, M.D., Associate Dean for Undergraduate Medical Education
 STEVEN G. MERANZE, M.D., Associate Dean for Faculty Affairs
 JOHN S. PENN, Ph.D., Associate Dean for Faculty Affairs
 ANN H. PRICE, M.D., Associate Dean for Alumni Affairs
 PAUL J. STERNBERG, M.D., Associate Dean for Clinical Affairs
 CHRISTOPHER S. WILLIAMS, M.D., Ph.D., Associate Dean for Physician Research Education; Director, Medical Scientist Training Program
 S. TOUFEEQ AHMED, Ph.D., Assistant Dean for Educational Informatics
 ARNA BANERJEE, M.D., Assistant Dean for Simulation in Medical Education
 JOEY BARNETT, Ph.D., Assistant Dean and Director, Office for Medical Student Research
 CHARLENE DEWEY, M.D., M.Ed., F.A.C.P., Assistant Dean for Educator Development
 JESSE EHRENFELD, M.D., M.P.H., Director, Education Research
 CATHLEEN C. PETTEPHER, Ph.D., Assistant Dean for Medical Student Assessment
 ANDERSON W. SPICKARD III, Assistant Dean for Educational Design and Technology
 LYNN E. WEBB, Ph.D., Assistant Dean for Faculty Development
 MICHAEL PONS, Administrative Officer, Office of Health Sciences Education
 DONNA E. ROSENSTIEL, L.C.S.W., Administrative Director, Office of Health Sciences Education
 DONALD E. MOORE, JR., Ph.D., MD Curriculum Evaluation Director
 LINDSEY MOLONEY, M.S., Administrative Director, Office of Undergraduate Medical Education
 REGINA G. RUSSELL, M.Ed., Director, Learning Systems Outcomes
 LOGAN KEY, M.Ed., Director, Office of Student Records
 JOSEPH M. GOFF, Assistant Director, Office of Support Services
 JENNIFER KIMBLE, M.Ed., Director, Admissions
 TBN, Assistant Director, Medical Scientist Training Program
 SHERRY STUART, Assistant Director, Student Financial Services

Executive Faculty

Jeffrey R. Balsler, Chair, Joey Barnett, Dan Beauchamp, Gordon Bernard, Donald Brady, Nancy Brown, Melinda Buntin, Richard Caprioli, Roger Chalkley, Walter Chazin, André Churchwell, Roger Cone, Jeff Conn, Nancy Cox, Jim Crowe, Bob Dittus, Marilyn Dubree, Elisabeth Dykens, Ron Eavey, Amy Fleming, Walter Frontera, John Gore, Kathy Gould, Frank Harrell, Kathie Hartmann, Stephan Heckers,

Jerry Hickson, Julie Hudson, Kevin Johnson, Howard Jones, Lisa Kachnic, Kim Lomis, Ian Macara, Bob Macdonald, Mark Magnuson, John Manning, Larry Marnett, Keith Meador, Steve Meranze, Bonnie Miller, Cecelia Moore, Hal Moses, Linda Norman, Reed Omary, John Penn, Jennifer Pietenpol, Wright Pinson, Al Powers, Ann Price, David Raiford, David Robertson, Dan Roden, Russell Rothman, Meg Rush, Warren Sandberg, Sam Santoro, Herb Schwartz, Yu Shyr, Corey Slovis, Bill Stead, Paul Sternberg, Anne Marie Tharpe, Mary Beth Thompson, Sten Vermund, Jeanne Wallace, Mark Wallace, Matt Weinger, Steve Webber, Consuelo Wilkins, John York, Wei Zheng, Mary Zutter.

Standing Committees

(The dean is an ex officio member of all standing and special committees.)

Doctor of Medicine Admissions Committee

The Admissions Committee has the responsibility of reviewing medical school applications for admission and making recommendations to the dean for the admission of those students who are considered best qualified.

Doctor of Medicine Phase Teams

Phase Teams consist of the course directors and major teachers responsible for implementation of the curriculum for each of the phases in medical school, as well as representatives of the Student Curriculum Committee and staff members working with the curriculum. The associate dean for undergraduate medical education and the Undergraduate Medical Education Executive Committee faculty chair coordinate the work of the Phase Teams to support the curricular quality improvement process.

Foundations of Medical Knowledge Team: Neil Osheroff, Chair. All block and longitudinal course directors serve on this committee. Ex officio: Kimberly D. Lomis, Bonnie M. Miller, Amy E. Fleming, Donna Rosenstiel, and Logan Key.

Foundations of Clinical Care Team: Ed Vasilevskis, Chair. All clerkship directors and longitudinal course directors serve on this committee. Ex officio: Kimberly D. Lomis, Bonnie M. Miller, Amy E. Fleming, Donna Rosenstiel, and Logan Key.

Immersion Team: Lourdes Estrada, William Cutrer, Co-Chairs. Members of the Immersion Phase Working Group and Advisory Team, along with Immersion course directors, serve on this committee. Ex officio: Kimberly D. Lomis, Bonnie M. Miller, Amy E. Fleming, Donna Rosenstiel, and Logan Key.

Doctor of Medicine Student Promotion Committees

Each promotion committee will have the responsibility for making recommendations to the dean and the executive faculty concerning promotion, remedial action, or dismissal as appropriate for each student in the class/phase for which it is responsible.

Immersion Phase

Geoffrey Fleming, Chair. Leslie Gewin, Jay Jerome, Ingrid Meszoely, Matt McEvoy, Kevin Niswender, Lorraine Ware, Tony Weil. Ex Officio: André L. Churchwell, Amy E. Fleming, Cathleen C. Pettepher, Kimberly D. Lomis, Bonnie M. Miller.

Foundations of Clinical Care Phase

Roy Zent, Chair. Reuben Bueno, Kecia Carroll, William (Bill) Cooper, Henry (Hank) Jennings, Joyce Johnson, Ela Knapik, James S. Powers, Consuelo Wilkins. Ex officio: André Churchwell, Amy E. Fleming, Cathleen C. Pettepher, Kimberly D. Lomis, Bonnie M. Miller.

Foundations of Medical Knowledge Phase

Margaret M. Benningfield, Chair. Bruce Carter, Lola Chambless, Keith Meador, Lisa A. Mendes, Jon Nesbitt, Henry (Earl) Ruley, Steven A. Webber. Ex officio: André L. Churchwell, Amy E. Fleming, Cathleen C. Pettepher, Kimberly D. Lomis, Bonnie M. Miller.

Doctor of Medicine Undergraduate Medical Education Committee

The Undergraduate Medical Education Executive Committee (UMEC) is composed of members of the School of Medicine leadership appointed by the dean to include key faculty leaders from multiple departments and led by a faculty chair of the committee, also appointed by the dean. (Details of committee membership are outlined in the UMEC charter.)

Ex officio members include the senior associate dean for health sciences education, the associate dean for undergraduate medical education, the associate dean for medical student affairs, the associate dean for diversity, the assistant dean for assessment, the assistant dean for educational informatics and technology, the director of program evaluation, the phase team leaders and leaders of longitudinal elements. There is also student representation on this committee.

UMEC is advisory to the dean, and, along with the dean, it holds authority for central oversight of the UME curriculum. UMEC meets monthly. Meetings are devoted to course approval/evaluation, program evaluation, thread evaluation, and/or educational policy. The agenda is determined jointly by the faculty chair of the committee and the associate dean for UME. The committee has the option of convening additional meetings as needed.

The UMEC members for the current academic year include: James Atkinson, Chair; David Charles, Ronald Cowan, Howard Jones, James Muldowney, Tyler Reimschisel, Reed Omary, Margaret Rush, Sally York.

Faculty Appointments and Promotion Committee (FAPC) and Clinical Practice Appointment and Promotion Committee (CPAPC)

These committees, appointed by the dean, are responsible for consideration of faculty promotion in the School of Medicine and for examination of credentials of candidates for appointment to faculty positions.

FAPC: Cathleen C. Pettepher, Chair. Laura Lee Dugan, Scott W. Hiebert, Joyce E. Johnson, Robert Labadie, Fred S. Lamb, Edward Sherwood, Yu Shyr. Ex officio: John S. Penn, David S. Raiford.

CPAPC: Neal R. Patel, Chair. John G. Huff, Michael N. Neuss, William Marshall Petrie, Michael Pilla. Ex officio: John S. Penn, David S. Raiford.

Medical Innovators Development Program (MIDP) Internal Advisory Council

The MIDP Internal Advisory Council provides strategic planning and program oversight for all aspects of the program. This committee meets once or twice each year.

Alan Bentley, Robert Dittus, Philippe Fauchet, John Gore, Robert Labadie, Kimberly D. Lomis, Kevin Johnson, and Larry Van Horn.

Medical Innovators Development Program (MIDP) Leadership Team

The MIDP Leadership Team is appointed annually by the dean to assist in the admission process and provide program oversight and strategic planning. Each applicant for the MIDP is interviewed individually by several members of this team, which serves as the School of Medicine Admission Committee for the MIDP.

Reed Omary, Director; André Churchwell, Victoria Morgan, and Trent Rosenbloom. A student member is appointed to the leadership team each year.

Medical Scientist Training Program (MSTP) Admissions Committee

The MSTP Admissions Committee (MAC) is appointed annually by the dean to assist in the admissions process and provide program oversight and strategic planning. Each applicant for the MSTP is interviewed individually by several members of the MAC, which serves as the School of Medicine Admissions Committee for the MSTP. The MAC includes several institutional leaders and senior scientists with responsibility for M.D. and Ph.D. training.

Christopher S. Williams, Director. Michelle M. Grundy, Sally York, Danny Winder, Associate Directors; Megan Williams and Melissa Krasnove, Assistant Directors. R. Daniel Beauchamp, Bruce D. Carter, Kevin Ess, Cynthia Gadd, Maria Hadjifrangiskou, Katherine Hartmann, Charles Hong, Duco Jansen, Pierre Massion, Andrea Page McCaw, Wellington Pham, Dan M. Roden, Michelle Southard-Smith, Roy Zent. Student Members: Lillian Juttukonda, Matt Stier. Ex officio: G. Roger Chalkley, André Churchwell, Amy E. Fleming, Kimberly D. Lomis, Bonnie M. Miller.

Medical Scientist Training Program (MSTP) Senior Oversight Committee

The MSTP Senior Oversight Committee provides guidance about all aspects of the program. This committee meets once or twice each year and is focused on strategic planning and program oversight.

Christopher S. Williams, Director. Michelle M. Grundy, Danny Winder, Sally York, Associate Directors; Megan Williams and Melissa Krasnove, Assistant Directors. G. Roger Chalkley, Chair. Kimberly D. Lomis, Lawrence J. Marnett, Bonnie M. Miller, David Robertson, Amy E. Fleming.

Quantitative and Chemical Biology Executive Committee

The Quantitative and Chemical Biology (QCB) Executive Committee is responsible for evaluating and admitting students to the QCB, which is a doctoral training program designed for those interested in pursuing research at the interface of chemical, physical, and biological sciences. The Executive Committee will review the progress of the first-year graduate students in the program before recommending students to the graduate programs of Biochemistry, Biological Sciences, Cancer Biology, Cell and Developmental Biology, Cellular and Molecular Pathology, Chemical and Physical Biology, Chemistry, Human Genetics, Mathematics, Molecular Physiology and Biophysics, Microbiology and Immunology, Neuroscience, Pharmacology, and Physics. Based on their field of research, students are welcome to pursue doctoral scholarship in the School of Medicine, the College of Arts and Science, and the School of Engineering.

Hassane Mchaourab, Chair. Beth Bowman, Timothy Cover, Melanie Ohi, Todd Peterson, Erin Rericha, and David Weaver.

Selected Other Committees Related to Medical Education

Global Health Education Committee

The Global Health Education Committee (GHEC) supports the vision of the School of Medicine and the Vanderbilt University Medical Center to provide an array of global health education and training opportunities for VUSM and VUMC trainees while simultaneously enhancing the capacity of our partners in a collaborative effort to address global health challenges.

Donald Brady, Melissa Carro, Quentin Eichbaum, Natasha Halasa, Doug Heimburger, Kathryn Hofeldt, Julie Lankford, Marie Martin, Bonnie Miller, Doug Morgan, and Melinda New.

Interdisciplinary Graduate Program Executive Committee

The Interdisciplinary Graduate Program Executive Committee is concerned with graduate student affairs and graduate programs in the Medical Center. It is responsible for admitting students to the Interdisciplinary Graduate Program in the Biomedical Sciences; for recommending candidates for fellowships and other funds available for the program; and for reviewing activities and progress of the students in the program and recommending students to the Departments of Biochemistry, Biological Sciences, Cancer Biology, Cell and Developmental Biology, Molecular Physiology and Biophysics, Neuroscience, Pathology, Microbiology and Immunology, and Pharmacology and to the graduate programs in Chemical and Physical Biology, Human Genetics, and Neuroscience for the completion of the Ph.D.

James G. Patton, Chair. Todd Graham, Brian Wadzinski, Barbara Fingleton, Tonia Rex, Sebastian Joyce, Ethan Lee, Richard M. O'Brien, Kevin Schey, Bill Valentine, Lea Davis, Beth Bowman, G. Roger Chalkley.

Vanderbilt Institute for Clinical and Translational Research (VICTR) Scientific Review Committee

The VICTR Scientific Review Committee meets regularly to act upon research proposals requesting support for the use of the VICTR resources including the Clinical Research Center, Health Services Research, Biomedical Informatics, Biomedical Statistics, Research Cores, and Research Support Services.

Talat (Alp) Ikizler, Co-chair; Alan Storrow, Co-chair. Shari Barkin, David Charles, Zhongmao Guo, David Haas, Rizwan Hamid, Lorraine Mion, Harvey Murff, Kevin Niswender, Bogdan Nowicki, Josh Peterson.
Ex officio: Gordon R. Bernard, Italo Biaggioni, Frank E. Harrell, David Robertson.

Archived 2016/2017
School of Medicine Catalog

Vanderbilt University

When Commodore Cornelius Vanderbilt gave a million dollars to build and endow Vanderbilt University in 1873, he did so with the wish that it “contribute to strengthening the ties which should exist between all 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 2,000 full-time members and a diverse student body of about 10,000. 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, park-like setting of broad lawns, shaded paths, and quiet plazas.

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

The schools of the university offer the following degrees:

College of Arts and Science. Bachelor of Arts.

Blair School of Music. Bachelor of Music.

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

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

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

Law School. Master of Laws, Doctor of Jurisprudence.

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

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

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

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

No honorary degrees are conferred.

Mission, Goals, and Values

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

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

In pursuit of these goals, Vanderbilt values most highly

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

Accreditation

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

Please contact the commission only in relation to Vanderbilt’s noncompliance with accreditation requirements. Normal inquiries about admission requirements, educational programs, and financial aid should be directed to the university.

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 Resources

Graduate Student Council

The Graduate Student Council (GSC) exists to enhance the overall educational experience at Vanderbilt University by promoting the general welfare and concerns of the Graduate School student body. This is achieved through the creation of new programs and initiatives to provide opportunities for growth and interaction, as well as through communication with the Vanderbilt faculty and administration on behalf of graduate students. The GSC consists of elected representatives, standing committees, and an annually elected executive board. In the recent past, the GSC has helped change policies involving campus dining, free bus transportation, parking, and student health insurance. The GSC is also a member of the National Association of Graduate-Professional Students (NAGPS).

In addition to its representative function, the GSC also organizes a number of events and hosts/sponsors various projects during the year, including co-sponsoring seminars and panels with individual departments, organizing the Vanderbilt 3 Minute Thesis competition (spring semester), facilitating the Graduate Student Honor Council, planning community outreach activities, and offering many 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 School students are welcome and encouraged to attend GSC's monthly meetings and to get involved. For more information, visit studentorgs.vanderbilt.edu/gsc.

Career Development for Graduate School Students

The Dean's Office of the Graduate School is dedicated to helping students navigate the transition from degree to career. Guidance and professional development opportunities are offered throughout a Graduate School student's program, in the form of individual advising, workshops, seminars, and Web-based resources. Topics range from creating an effective CV/resume, to interviewing skills, to establishing a network for both academic and non-academic career searches. For Ph.D.'s in the biomedical disciplines, the Office of Biomedical Research Education and Training (BRET) offers similar services. For Ph.D.'s in Peabody College, the Peabody Office of Professional and Graduate Education (POPGE) offers complementary resources. Additional resources for particular career interests are available through a campus partnership with the Career Center. Through these numerous services, students will find ample assistance for their career searches. For more information, visit my.vanderbilt.edu/gradcareer.

Graduate Development Network

The Graduate Development Network (GDN) 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 network's website (vanderbilt.edu/gradschool/gdn) 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.

The Center for Teaching

The mission of the Center for Teaching is to promote university teaching that leads to meaningful student learning. The services of the center are available to all graduate students, including those teaching at Vanderbilt as teaching assistants (TAs) and instructors of record, as well as those who anticipate that teaching will be a part of their future careers.

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

The Certificate in College Teaching has been designed to assist graduate students who wish to develop and refine their teaching skills. The certificate focuses on the research on how people learn and best teaching practices, and supports the university's pursuit of excellence in teaching and learning. The certificate is ideal for graduate students whose goals are to become more effective educators and who want to prepare for future careers in higher education teaching.

The Blended and Online Learning Design (BOLD) Fellows Program helps graduate students in the STEM disciplines (science, technology, engineering, and mathematics) partner with faculty members to design and develop online modules for integration into a course. The teams implement these modules in existing classes and investigate their impact on student learning.

The Certificate in Humanities Teaching & Learning is a program for humanities graduate students that comprises a sequential seminar and practicum in which participants explore humanistic pedagogies and teaching historically underrepresented populations.

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 and other services, please visit the Center for Teaching website at cft.vanderbilt.edu or call (615) 322-7290.

Other Campus Resources

Barnes & Noble at Vanderbilt

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

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 Vanderbilt Recreation and Wellness Center.

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

Eating on Campus

Vanderbilt Campus Dining operates several restaurants, cafes, and markets throughout campus that provide a variety of food. The two largest dining facilities are Rand Dining Center in Rand Hall (connected to Sarratt Student Center) and The Ingram Commons dining hall. Six convenience stores on campus offer grab-and-go meals, snacks, beverages, and groceries. All units accept the Commodore Card and Meal Plans. Graduate student Meal Plans are offered at a discount. For more information, hours, and menus, go to campusdining.vanderbilt.edu.

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 (apphost1a.its.vanderbilt.edu/housing/Main/). The referral service lists information about housing accommodations off campus. Cost, furnishings, and conditions vary greatly. For best choices, students seeking off-campus housing should visit the office or consult the website as early as possible for suggestions and guidance. The website 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 the University Registrar immediately. Candidates for degrees who are not in residence should keep the school and the University Registrar informed of current mailing addresses. To change or update addresses, go to registrar.vanderbilt.edu/academicrec/address.htm.

Information Technology

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

VUIT maintains and supports VUNet, the campuswide data network that provides access to the internet, and AccessVU, the authentication service that enables Vanderbilt users to securely identify themselves to many services on VUNet. Those services include YES, Your Enrollment Services; Blackboard; and Vmail, the university’s email system.

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

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

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

Furthermore, VUIT provides various conferencing and collaboration services for students, including audio and video conferencing via a desktop or a Polycom bridge. Vanderbilt’s blog service offers WordPress Blogs at my.vanderbilt.edu. See it.vanderbilt.edu/services/collaboration for more information.

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

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

International Student and Scholar Services

International Student and Scholar Services (ISSS), located in the Student Life Center, fosters the education and development of nonimmigrant 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 nonimmigrant students and scholars to the U.S. Further, ISSS keeps abreast of the regulations pertaining to international students and scholars in accordance with the Department of Homeland Security (Bureau of Citizenship and Immigration Services) and the Department of State. ISSS coordinates semiannual 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 provides the campus with additional opportunities to learn about world cultures and to celebrate diversity. The International Lens Film Series (iLens) brings more than forty international films to campus each year. ISSS provides a range of programs and activities throughout the year to address a variety of international student needs and interests. These programs include International Orientation Leaders and a selection of holiday parties. The Southern Culture Series is an opportunity for students to experience Southern culture in nearby cities such as Memphis, Chattanooga, and Atlanta.

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 website at vanderbilt.edu/catalogs.

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 website at vanderbilt.edu/financialaid. The Office of Student Financial Aid is located at 2309 West End Avenue, Nashville, Tennessee 37203-1725, (615) 322-3591 or (800) 288-0204.

Information about graduation rates for students at Vanderbilt University is available on the Vanderbilt University website at virg.vanderbilt.edu. Select “Factbook,” then “Student,” then “Retention/Graduation Rates.” Paper copies of information about graduation rates may be obtained by writing the Office of the University Registrar, Vanderbilt University, PMB 407701, 2301 Vanderbilt Place, Nashville, Tennessee 37240-7701 or by calling (615) 322-7701.

The Vanderbilt University *Annual Security 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 website at police.vanderbilt.edu/annual-security-report. A paper copy of the report may be obtained by writing the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212 or by calling (615) 343-9750. For more information, see “Vanderbilt University 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, Tennessee 37212 or by calling (615) 322-7992.

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 website at 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, PMB 407701, 2301 Vanderbilt Place, Nashville, Tennessee 37240-7701 or by calling (615) 322-7701. For more information, see “Confidentiality of Student Records” in this catalog.

The Writing Studio

The Writing Studio offers graduate students personal writing consultations, fifty-minute interactive discussions about writing. Trained writing consultants can act as sounding boards and guides for the development of arguments and the clarification of ideas. The focus of a consultation varies according to the individual writer and project. In addition to the standard fifty-minute consultations, the Writing Studio also offers dissertation writers the possibility of having extended appointments with the same consultant on an ongoing basis. Fifty-minute appointments can be scheduled online at vanderbilt.edu/writing. Extended appointments must be arranged in advance through writing.studio@vanderbilt.edu and are available on a first-come, first-served basis. Information about other programs for graduate students, like the journal article writing workshop and the annual dissertation writer’s retreat, can also be found at vanderbilt.edu/writing.

Bishop Joseph Johnson Black Cultural Center

The Bishop Joseph Johnson Black Cultural Center (BJJBCC) represents one of Vanderbilt University’s numerous efforts at acknowledging and promoting diversity. It does so by providing educational and cultural programming on the black experience for the entire Vanderbilt community. Dedicated in 1984, the center is named for the first African American student admitted to Vanderbilt University in 1953, Bishop Joseph Johnson (B.D. ’54, Ph.D. ’58).

One of the center’s aims is to provide cultural programming. It sponsors lectures, musical performances, art exhibitions, films, and discussions on African and African American history and culture. The center also provides an office space for a scholarly journal, the *Afro-Hispanic Review*, edited by Vanderbilt faculty and graduate students.

Another of the center’s aims is student support and development. The center provides meeting spaces for numerous Vanderbilt student groups, including the Black Student Alliance, Every Nation Campus Ministries, and Vanderbilt Spoken Word. The center works with students on a wide range of campus projects and community service opportunities. The center also serves as a haven for students, with opportunities for informal fellowship with other students of all levels as well as with faculty and staff.

One additional aim of the center is community outreach and service. To this end, the center reaches out to civic and

cultural groups. The BJJBC facilitates tutoring and mentoring activities for young people from the Metro Nashville Public Schools, the YMCA, and other community agencies. VU students serve as tutors and mentors to young people in the Edgehill community. The center also helps promote student recruitment by hosting various pre-college groups.

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.

Libraries

The Jean and Alexander Heard Library System

Vanderbilt University's libraries are among the top research libraries in the nation, home to more than eight million items, including print publications, microfilm items, and digital collections. The libraries provide electronic access to tens of thousands of full-text journals and more than half a million e-books and other research resources accessible via the campus network, from 250 workstations in campus libraries, as well as authenticated access (VUNetID and e-password) from off campus. The libraries' homepage receives more than 3,750,000 visits annually. Resources may be located through Acorn, the libraries' online catalog, and through DiscoverLibrary, the libraries' new information discovery tool.

The oldest manuscript in the collection dates from ca. 1300, and new publications are being added every day. Among the libraries' collection strengths are the W. T. Bandy Center for Baudelaire and Modern French Studies, a comprehensive collection of materials on Charles Baudelaire and French literature and culture; the Southern Literature and Culture Collection; Latin American collections for Brazil, Colombia, the Andes, Mesoamerica, and Argentina; the Television News Archive, the world's most extensive and complete archive of television news covering 1968 to the present; the Revised Common Lectionary, one of the first published Web-based resources of scriptural readings for the liturgical year; and the Global Music Archive, a multimedia reference archive and resource center for traditional and popular song, music, and dance of Africa and the Americas.

In partnership with faculty, library staff teach students valuable skills for locating and evaluating the latest information in a complex array of sources. Campus libraries with discipline-specific collections are home to professional librarians who provide expert support in that area of study. Online reference is available through the homepage. Options for individual study are complemented by group study spaces and instructional rooms, as well as learning commons and cafes. Exhibits throughout the libraries offer intellectual and creative insights that encourage students to see their own work in new ways. Students, faculty, and staff may come to the library to read in a cozy nook, meet friends for group study, grab a quick meal, or see an exhibit.

library.vanderbilt.edu

The Annette and Irwin Eskind Biomedical Library

The Eskind Biomedical Library (EBL) collects and provides access to materials to support the teaching, research, and service missions of Vanderbilt University Medical Center.

Margaret Cuninggim Women's Center

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

The Women's Center celebrates women and their accomplishments and fosters empowerment for people of all identities. The center offers individual support and advocacy around a variety of issues, including gender stereotyping, gender equity, leadership, parenting, body image, disordered eating, pregnancy and reproduction, sexual health, and more. The Women's Center is open Monday through Friday, 8:00 a.m. to 5:00 p.m. and is located at 316 West Side Row. For more information, please call (615) 322-4843 or visit vanderbilt.edu/womenscenter.

Office of LGBTQI Life

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

Office of the University Chaplain and Religious Life

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

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

Schulman Center for Jewish Life

The 10,000-square-foot Ben Schulman Center for Jewish Life is the home of Vanderbilt Hillel. The goal of the center is to provide a welcoming community for Jewish students at Vanderbilt and to further religious learning, cultural awareness, and social engagement. Vanderbilt Hillel is committed

to enriching lives and enhancing Jewish identity. It provides a home away from home, where Jews of all denominations come together, united by a shared purpose. The Schulman Center is also home to Grin's Cafe, Nashville's only kosher and vegetarian restaurant. For further information about the Schulman Center, please call (615) 322-8376 or email hillel@vanderbilt.edu.

Parking, Vehicle Registration, and Alternative Transportation

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

Bicycles must be registered with the Vanderbilt University Police Department.

All graduate and professional students can ride to and from the Vanderbilt campus free of charge on Nashville's Metropolitan Transit Authority buses. To use this service, a valid student ID card is required for boarding the bus.

Project Safe Center

The Project Safe Center partners with students, faculty, and staff to create a campus culture that rejects sexual violence and serves as a resource for all members of the Vanderbilt community. Operating under the auspices of the Office of the Dean of Students, the Project Safe Center provides support to survivors of sexual violence and engages the campus community in bystander intervention efforts and sexual assault prevention.

Green Dot, a bystander intervention program used by colleges and communities nationwide, an online education module addressing power-based violence, and a variety of programs and presentations on consent, healthy relationships, and violence prevention are available through the Project Safe Center. A 24-hour support hotline answered by Project Safe's victim resource specialists is available at (615) 322-SAFE (7233).

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

Psychological and Counseling Center

As part of the Vanderbilt University Medical Center, the PCC supports the mental health needs of all students to help them reach their academic and personal goals. Highly skilled and multidisciplinary staff collaborates with students to provide evidence-based treatment plans tailored to each individual's unique background and needs. The PCC also emphasizes prevention through outreach and consultation focused on the development of the skills and self-awareness needed to excel in a challenging educational environment.

The PCC's psychologists, licensed counselors, and psychiatric medical providers are available to any Vanderbilt student and address a range of student needs including stress management, crisis intervention, substance abuse counseling, management of medications, individual counseling, group counseling, biofeedback, emergency assessments, and psychiatric assessment and treatment. The PCC provides a team approach to the care of students with eating disorders and students who have experienced trauma as well as students needing both

counseling and medication management. There is an on-call provider after hours and on weekends for emergency calls.

The PCC provides screening and full assessment when indicated for ADHD and learning disorders as well as assessment and support for reading and study skills.

A prevention program regarding substance use called BASICS is provided by the PCC. Students who have questions about their level of use may request an assessment through BASICS to learn more about risk related to substance use.

The PCC also houses a Mind Body Lab. This room is designed with the objective of enhancing mindfulness by providing tools to manage stress, increase personal resilience, and promote compassion and academic success. Students may book a forty-five-minute session in the PCC Mind Body Lab by calling the PCC at (615) 322-2571 or by stopping by the front desk.

Students are encouraged to make contact with the PCC prior to the start of the school year if they have a history of mental health care needs. This will help facilitate the transition of care and ensure that students are fully aware of PCC resources. Contact the center at (615) 322-2571 for more information.

There is no charge for services with the exceptions of reduced fees for LD/ADHD screening and assessment. Over the course of a year, approximately 20 percent of the Vanderbilt student population will seek out the services of the PCC.

Throughout the year, the PCC outreach coordinator and other PCC staff also produce presentations, including educational programs, thematic presentations, and special events, focused on education of the Vanderbilt community about mental health issues and resources. The PCC is proud to provide a program focusing on suicide prevention and mental health awareness at Vanderbilt called MAPS: Mental Health Awareness and the Prevention of Suicide.

For more information, visit medschool.vanderbilt.edu/pcc.

Student Health Center

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

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

Emergency consultations services (at (615) 322-2427) are available 24 hours a day, 7 days a week from on-call professionals. For more detailed information on the services available at the Student Health Center and information on other health-related topics, please visit the Student Health Center website at medschool.vanderbilt.edu/student-health.

Immunization Requirements

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

The requirements include:

1. *Varicella vaccine (two injections)* is required for all students who have not had documented chickenpox. Any waivers for this vaccine are very strict, and include only certain religious or medical exemptions that must be approved by the medical director of the Student Health Center. For more information regarding this waiver, please call the director's assistant at (615) 322-2254 or email studenthealth@vanderbilt.edu.
2. *Measles, mumps, and rubella (2 injections)* for all incoming students. Any waivers for this vaccine are very strict, and include only certain religious or medical exemptions that must be approved by the medical director of the Student Health Center. For more information regarding this waiver, please call the director's assistant at (615) 322-2254 or email studenthealth@vanderbilt.edu.

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

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

Students should go to medschool.vanderbilt.edu/student-health/immunization-requirements in order to access more information regarding the immunization requirements. This site also contains links to the PDFs of the required forms.

All vaccines can be administered at either a private provider office or at the Student Health Center.

Student Injury and Sickness Insurance Plan

All students registered in degree programs for 4 or more credit hours, or who are actively enrolled in research courses (including but not limited to dissertation or thesis courses) that are designated by Vanderbilt University as full-time enrollment are required to have health insurance coverage. The university offers a sickness and injury insurance plan that is designed to provide hospital, surgical, and major medical benefits. A brochure explaining the limits, exclusions, and benefits of insurance coverage is available to students online at gallagherstudent.com/vanderbilt or medschool.vanderbilt.edu/student-health/student-health-insurance.

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

A student who does not want to subscribe to the insurance plan offered through the university must complete an online waiver process at gallagherstudent.com/vanderbilt. This process must be completed by August 1 for students enrolling in the fall for annual coverage. Newly enrolled students for the spring term must complete the online waiver process by January 4. The online waiver process indicating comparable coverage **must be completed every year by August 1** in order

to waive participation in and the premium for the Student Injury and Sickness Insurance Plan.

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

International Student Coverage

International students and their dependents residing in the United States are required to purchase the university's international student injury and sickness insurance. If you have other comparable insurance and do not wish to participate in the Student Injury and Sickness Insurance Plan offered through the university, you must complete an online waiver process (gallagherstudent.com/vanderbilt) indicating your other insurance information. This online waiver process must be completed no later than September 7 or you will remain enrolled in the plan offered by the university and will be responsible for paying the insurance premium. This insurance is required for part-time as well as full-time students.

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 Equal Opportunity, Affirmative Action, and Disability Services Department. 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. Specific concerns pertaining to services for people with disabilities or any disability issue should be directed to the Disability Program Director, Equal Opportunity, Affirmative Action, and Disability Services Department (EAD), PMB 401809, 2301 Vanderbilt Place, Nashville, Tennessee 37240-1809; phone (615) 322-4705 (V/TDD); fax (615) 343-0671; vanderbilt.edu/ead.

Nondiscrimination, Anti-Harassment, and Anti-Retaliation

The Equal Opportunity, Affirmative Action, and Disability Services Department investigates allegations of prohibited discrimination, harassment, and retaliation involving members of the Vanderbilt community. This includes allegations of sexual misconduct and other forms of power-based personal violence. Vanderbilt's Title IX coordinator is Anita Jenious, EAD director.

If you believe that a member of the Vanderbilt community has engaged in prohibited discrimination, harassment, or retaliation, please contact the EAD. If the offense is criminal in nature, you may file a report with Vanderbilt University Police Department (VUPD).

The EAD also facilitates interim accommodations for students impacted by sexual misconduct and power-based personal violence. Some examples of interim accommodations include stay-away orders, adjusted course schedules, and housing changes.

Specific concerns pertaining to prohibited discrimination, harassment, or retaliation, including allegations of sexual

misconduct and other forms of power-based personal violence, should be directed to the Equal Opportunity, Affirmative Action, and Disability Services Department (EAD), PMB 401809, 2301 Vanderbilt Place, Nashville, Tennessee 37240-1809; phone (615) 322-4705 (V/TDD); fax (615) 343-0671; vanderbilt.edu/ead.

Student Records (Family Educational Rights and Privacy Act)

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

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

FERPA provides the university the ability to designate certain student information as "directory information." Directory information may be made available to any person without the student's consent unless the student gives notice as provided for, below. Vanderbilt has designated the following as

directory information: the student's name, address, telephone number, email address, student ID photos, major field of study, school, classification, participation in officially recognized activities and sports, weights and heights of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended by the student, and other information that would not generally be considered harmful or an invasion of privacy if disclosed. Any student who does not wish disclosure of directory information should notify the University Registrar in writing. No element of directory information as defined above is released for students who request nondisclosure except as required by statute.

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

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

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

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

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

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

Vanderbilt Directory

Individual listings in the online People Finder Directory consist of the student's full name, Vanderbilt email address, and campus mailing address (if available). Students may elect to add additional contact information to their listings, including school, academic classification, local phone number, local address, permanent address, cellphone, pager, and fax numbers. Student listings in the People Finder Directory are available to the Vanderbilt community via logon ID and e-password. Students may choose to make their online People Finder listings available to the general public (i.e., viewable by anyone with access to the internet), or to block individual directory items. Students who have placed a directory hold with the University Registrar will not be listed in the online directory.

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

Official University Communications

Certain federal statutes require that information be delivered to each student. Vanderbilt delivers much of this information via email. Official electronic notifications, including those required by statutes, those required by University policy, and instructions from University officials, will be sent to students' Vanderbilt email addresses: *user.name@vanderbilt.edu*. Students are required to be familiar with the contents of official University notifications, and to respond to instructions and other official correspondence requiring a response. Some messages will include links to the YES Communications Tool, which is a secure channel for official communication of a confidential nature.

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

University Courses

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

Vanderbilt Child and Family Center

The Vanderbilt Child and Family Center supports the health and productivity of the Vanderbilt community by providing resource and referral services and quality early childhood education and care to the children of faculty, staff, and students. The center's website at childandfamilycenter.vanderbilt.edu provides information concerning child care, elder care, summer camps, tutoring services, and school-age child care. *Care.com* and the Vanderbilt Sitter Service provide back-up care options for dependents of all ages and evening, night, and weekend care.

The Child Care Center serves children ages six weeks through five years. Applications for the waiting list may be downloaded from the website. The Family Center offers a monthly lunchtime series, Boomers, Elders, and More, and a caregiver support group.

Vanderbilt University Police Department

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

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

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

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

Vandy Vans—The Vanderbilt University Police Department administers the Vandy Vans escort system at Vanderbilt University. The Vandy Vans escort system provides vehicular escorts to designated locations on campus. The service consists of vans that operate from 5:00 p.m. to 5:00 a.m. GPS technology allows students to track Vandy Vans on their route via computer or mobile phone, and to set up text message alerts to let them know when a van will be arriving at their stop.

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

As a supplement to the Vandy Vans van service, walking escorts are available for students walking to and from any location on campus during nighttime hours. Walking escorts are provided by VUPD officers. The telephone number to call for a walking escort is (615) 421-8888, or 1-8888 from a campus phone, after which, a representative from VUPD will be dispatched to the caller's location, or to a designated meeting point to accompany the caller to his or her destination.

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

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

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

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

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

Additional information on security measures and crime statistics for Vanderbilt is available from the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212. Information is also available at police.vanderbilt.edu.

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

This booklet is prepared with information provided by the Nashville Metropolitan Police Department, the Department of Student Athletics, Office of the Dean of Students, the Office of Housing and Residential Education, and the Vanderbilt University Police Department. It summarizes university programs,

policies, and procedures designed to enhance personal safety for everyone at Vanderbilt.

A copy of this report may be obtained by writing or calling the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212 or by telephone at (615) 343-9750. This report may also be obtained on the website at police.vanderbilt.edu/annual-security-report.

Extracurricular Activities

Student Centers

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

Sarratt Student Center|Rand Hall is the main student center hub, housing a 300-seat cinema, art gallery, art studios, multicultural space, rehearsal rooms, large lounge spaces, large and small meeting spaces, and a courtyard. The facility is also home to Vanderbilt Student Communications, radio station, TV station, Last Drop Coffee Shop, and the Pub at Overcup Oak restaurant. Rand Hall houses the Rand Dining Center, campus store, student-operated businesses, the Anchor (student organization space), a multipurpose venue, meeting and seminar rooms, plus large, open lounge space. Some of the offices located in Sarratt Student Center|Rand Hall include the Dean of Students, Greek Life, Leadership, and the Office of Active Citizenship and Service. Also included in this facility is a Ticketmaster™ outlet and a United States Postal Service office.

The Vanderbilt Student Life Center is the university's 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|Rand Hall. The Student Life Center has more than 18,000 square feet of event and meeting space, including the 9,000-square-foot Commodore Ballroom, which is one of the most popular spaces to have events on campus. The center is also home to the Center for Student Professional Development, International Student and Scholar Services, Global Education Office, and Global Support Services.

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

Alumni Hall was the original student center on campus when the building opened in 1925. Re-opened in fall 2013 after a yearlong renovation that transformed every space in the facility, Alumni Hall has returned to its role as a student center after serving other purposes over the years. In the newly renovated Alumni Hall, students now have access to an exercise room as well as several new meeting and event spaces and the Bamboo Bistro. Two departments call Alumni Hall home, the Vanderbilt Institute for Digital Learning and, most recently, the Vanderbilt Graduate School.

Opened in fall 2014, Kissam Center is the fifth student center, and is part of the new Warren College and Moore College

residential living-learning communities. A completely new facility, Kissam Center is home to more meeting and event spaces as well as the Kissam Market and Kissam Kitchen.

Recreation and Sports

Physical education is not required for graduate and professional students, but almost two-thirds of Vanderbilt University students participate in club sports, intramurals, activity classes, or other programs offered at the Vanderbilt Recreation and Wellness Center (VRWC). The large variety of programs available for meeting students' diverse interests include: thirty-two club sports teams; forty intramural sports (softball, flag football, basketball, table tennis, and soccer); an aquatics program offering swim lessons for all ages and abilities. Red Cross lifeguarding and CPR classes are also available. If being outside is more your style, you can choose from one of more than twenty adventure trips offered each semester or create your own adventure trip with tips and gear from the Outdoor Recreation staff. There are more than eighty group fitness classes a week and a variety of wellness offerings from "learn to box" to healthy eating through Vandy Cooks in the demonstration kitchen, Personalized Nutrition Coaching, and Nutrition Minute grab-and-go information on a variety of nutrition topics.

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

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

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

Medical Education at Vanderbilt

THE Vanderbilt University School of Medicine administers degree programs that provide students with the knowledge, skills, and attitudes they will need to practice safe, effective, ethical, evidence-based, and patient-centered health care in the 21st century, and to contribute to the knowledge base supporting it.

Mission of the School

The mission of Vanderbilt University School of Medicine is to improve human health. To achieve this goal, we will:

- Prepare physicians, scientists, and educators for positions of worldwide leadership;
- Discover and disseminate new knowledge that advances understanding of health and disease;
- Provide compassionate, personalized patient care of the highest quality in service to our local, national, and global communities;
- Embrace a culture of lifelong learning, innovation, and continuous improvement;
- Create a diverse and broadly inclusive community of faculty, staff, and students that enriches our learning environment and ensures excellence in research and patient care;
- Nurture and protect Vanderbilt's unique legacy of cooperation, collegiality, and mutual respect;
- Foster the personal and professional growth of all members of the Vanderbilt community, as we continuously strive to realize full potential.

The school's mission includes the education of physicians at all levels of their professional experience: medical school; post-graduate education, including basic science and clinical training; and continuing education and professional development for the practicing physician. In addition several master's level and two additional doctoral degrees in health care professions are offered.

Faculty members teach the practice of exemplary patient care at all levels; model programs of health care delivery, at primary, secondary, and tertiary levels; and fulfill the school's responsibility for community service.

In addition to teaching, members of the medical school faculty have a complementary responsibility to generate new knowledge through research. At Vanderbilt, research encompasses basic scientific questions, issues in clinical care, questions related to the health care system, and scholarship in the medical education process itself. Vanderbilt is recognized as one of the leaders in research among medical schools in the United States.

History of the School

The first diplomas issued by Vanderbilt University were to sixty-one doctors of medicine in February of 1875, thanks to an arrangement that recognized the University of Nashville's medical school as serving both institutions. Thus, Vanderbilt embraced a fully-organized and functioning medical school even before its own campus was ready for classes in October of that year.

The arrangement continued for twenty more years, until the school was reorganized under control of the Board of

Trust. In the early days, the School of Medicine was owned and operated as a private property of the practicing physicians who composed the faculty and received the fees paid by students—a system typical of medical education in the United States at the time. Vanderbilt made no financial contribution to the school's support and exercised no control over admission requirements, the curriculum, or standards for graduation. After reorganization under the Vanderbilt Board in 1895, admission requirements were raised, the course was lengthened, and the system of instruction was changed to include laboratory work in the basic sciences.

The famous report of Abraham Flexner, published by the Carnegie Foundation in 1910 and afterward credited with revolutionizing medical education in America, singled out Vanderbilt as “the institution to which the responsibility for medical education in Tennessee should just now be left.” Large grants from Andrew Carnegie and his foundation, and from the Rockefeller-financed General Education Board, enabled Vanderbilt to carry out the recommendations of the Flexner Report. (These two philanthropies, with the addition of the Ford Foundation in recent years, have contributed altogether more than \$20,000,000 to the School of Medicine since 1911.) The reorganized school drew upon the best-trained scientists and teachers in the nation for its faculty. The full benefits of reorganization were realized in 1925 when the school moved from the old South Campus across town to the main campus, thus integrating instruction in the medical sciences with the rest of the university. The school's new quarters were called “the best arranged combination school and hospital to be found in the United States.”

Rudolph A. Light Hall, completed in 1977, is a sophisticated facility for medical education and other student activities. The seven-story structure contains 209,000 square feet of space housing the latest in laboratory equipment, audio-visual and electronic teaching tools, and multi-purpose classroom space. The second-floor student lounge is designed to foster medical student interaction and to permit informal educational experiences—leading to the development of physicians grounded in the sciences but enlightened by humanitarian interests and understanding.

Beginning in 1996, several new degree programs became a part of the School of Medicine. These programs include courses of study in public health (1996), clinical investigation (2000), audiology (2002), medical physics (2002), laboratory investigation (2004), education of the deaf (2006), speech-language pathology (2007), health professions education (2010), and applied clinical informatics (2015).

Until April 2016, Vanderbilt University owned and operated several hospitals and clinics collectively known as Vanderbilt University Medical Center, including Vanderbilt University Hospital, Vanderbilt Psychiatric Hospital, and Monroe Carell Jr. Children's Hospital at Vanderbilt, and their associated clinics. Effective April 30, 2016, Vanderbilt University conveyed the clinical assets used in the operation of Vanderbilt University Medical Center to a newly formed, not-for-profit, tax-exempt corporation, which is similarly named Vanderbilt University Medical Center. Vanderbilt University Medical Center now operates independently of Vanderbilt University. It is clinically and academically affiliated with Vanderbilt University.

From the Students of Vanderbilt University School of Medicine: The Vanderbilt University Statement of the Honor Code

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

The School of Medicine Honor System

The Honor System at Vanderbilt University School of Medicine is conducted by students for the benefit of students, faculty, staff, and patients. The Honor System, as delineated by the Honor Code, requires students to conduct themselves with honor in all aspects of their lives as physicians-in-training. By demanding great responsibility, the Honor System fosters an environment of freedom and trust that benefits the entire Medical School. In signing this statement upon enrollment, each student agrees to participate in the Honor System and abide by its code.

As representatives of the Vanderbilt University School of Medicine and the medical professions, students pledge to conduct themselves with honor and integrity at all times. The Promotion Committees and the Honor Council serve to protect the environment of trust created by this Honor System. The Promotion Committees periodically evaluate each student's performance with special attention to work and conduct appropriate for professional practice. The Honor Council serves to educate members of the student body about their responsibilities as outlined in the written code; to conduct investigations and hearings regarding reported violations of the code; and to decide the nature of penalties deemed appropriate for such violations. Decisions reached by the Honor Council do not preclude the discussion of reported violations by the Promotion Committees, as the Committees may examine these incidents in the larger context of a student's general performance.

The School of Medicine Honor Code

All students pledge to conduct themselves honorably, professionally, and respectfully in all realms and aspects of medical education and patient care. Under the Honor System, the student pledges that he or she neither gives nor receives unauthorized aid nor leaves unreported any knowledge of such aid given or received by any other student. Unauthorized aid includes the use of any examinations from previous semesters that have not been pre-approved by the course director and made readily available to all other students taking the course. This pledge applies to all coursework, examinations, presentations, or any other activities required for the awarding of any of the graduate degrees offered by the School. This pledge encompasses all clinical work involving patient care and representations of patient care information. Any student taking a course in the School of Medicine, regardless of where registered, is under the jurisdiction of the Honor Council of Vanderbilt University School of Medicine (VUSM) and subject to the penalties it may impose.

Constitution

Article I—Name

The name of the council shall be the Honor Council of Vanderbilt University School of Medicine.

Article II—Purpose

1. To receive and evaluate evidence of Honor Code violations and to assure against false accusations.
2. To determine guilt or innocence.
3. To forward to the dean of the School of Medicine appropriate penalties for the guilty.

Article III—Membership and Officers

1. A faculty member shall be appointed by the dean of the School of Medicine as the Honor Council adviser. His/her roles include ensuring that all the rules are followed. In the case of an accusation, he/she will decide with the co-chairs of the Honor Council whether there is sufficient evidence to proceed with a trial after a formal investigation has been carried out.
2. The Honor Council of the School of Medicine shall be composed of representation from all degree-granting graduate programs under the administrative charge of the school. Currently, this includes Doctor of Audiology (Au.D.), Master of Education of the Deaf (M.D.E.), Master of Science Speech-Language Pathology (M.S.-S.L.P.), Doctor of Medical Physics (D.M.P.), Master of Science in Medical Physics (M.S.M.P.), Master of Laboratory Investigation (M.L.I.), Master of Public Health (M.P.H.), Master of Science in Clinical Investigation (M.S.C.I.), Master of Health Professions Education (M.H.P.E.), Master of Science in Applied Clinical Informatics (M.S.A.C.I.), and Doctor of Medicine (M.D.). Any new graduate degree programs created within the school will become eligible by sufficient enrollment, as stipulated below.
3. The minimum student enrollment limit for a single graduate degree program to be eligible to elect an Honor Council representative is ten. If a program falls below that number, it will not be eligible to have a representative. It will regain eligibility when its enrollment reaches a minimum of ten students. However, some of the programs are closely affiliated; if, in the judgment of the program director(s) of these programs, there is sufficient overlap in required courses, these programs may be thought of as a unit (a.k.a., "affiliated degree programs") for purposes of Honor Council representation. In these cases, the degree programs will be grouped for representation purposes, and allowed to elect an Honor Council representative on behalf of the affiliated degree programs. Current affiliated degree programs are the Au.D., M.D.E., and M.S.-S.L.P. programs, which will elect two representatives from their combined student cohorts, and the M.P.D. and M.S.M.P. programs, which will elect one representative from their combined student cohorts. All other non-M.D. programs will elect one representative. The M.D. program will follow its traditional practice of electing two representatives from each of the four classes.
4. In the non-M.D. programs, students will vote for Honor Council candidates within their own graduate program or affiliated degree programs. In the M.D. program, students will vote for Honor Council representatives within their own medical student class. Honor Council representatives are elected for one-year terms.
5. Honor Council members will select their own co-chairs. One co-chair will be elected from the senior class M.D. program Honor Council representatives, for which all Honor Council representatives will vote, and one co-chair will be elected from the non-M.D. Honor Council representatives, for which all Honor Council representatives will vote. In both cases, co-chairs will be elected by simple majority. Co-chairs are elected for one-year terms.
6. Voting for Honor Council representatives will be completed no later than April 1 of each year. The new Honor Council will convene to elect its co-chairs no later than April 30. It is the duty of the outgoing Honor Council co-chairs to assure a successful transition. The exception for the April 1

deadline for election of representatives is for incoming medical students who will elect their representatives in September, and for the entering cohort of students in any one-year degree programs, as long as there are at least ten enrolled students in that program.

Article IV—Duties of Officers

1. It shall be the duty of the co-chairs to preside at all meetings of the Honor Council, to arrange for the hearing of any student accused, and to perform all duties common to their office.
2. The secretary shall keep full minutes of all meetings and full proceedings of all hearings, which must be kept in permanent files. The secretary shall notify all members of all hearings, meetings, and retreats and shall perform any other related duties.
3. Honor Council representatives for each program, together with the co-chairs, will have primary responsibility for conducting an annual program to educate their fellow students about the Honor Council and its processes, and for assuring the timeliness of elections. Program directors and the Honor Council faculty adviser will act in a supportive and advisory capacity.

Article V—Meetings

1. One regular meeting shall be held within four weeks of the start of the school year. At this meeting, the co-chairs of the Honor Council and the faculty adviser will explain the duties and procedures of the Honor Council to the members.
2. Special meetings may be called by the co-chairs at any time and must be called within ten working days when requested by two or more members of the Honor Council.
3. All meetings shall be conducted according to *Roberts Rules of Order, Newly Revised*.
4. A meeting by the Honor Council to re-evaluate and review the Honor Code should be convened a minimum of every four years.

Article VI—Quorum

A quorum for an Honor Council hearing concerning a violation of the Honor Code is nine. This quorum may be adjusted by the co-chairs in circumstances in which students recuse themselves because the hearing concerns a faculty member who is, or will be, in a supervisory position over them. The absolute minimum for an Honor Council quorum shall be seven. In rare circumstances when a quorum is otherwise unavailable, the senior associate dean for health sciences education will appoint a temporary student member or members to assure a quorum is present to meet the timeline requirements for due process.

Article VII—Hearings

1. A hearing shall be called by the co-chairs of the Honor Council, if appropriate.
2. The accuser and the accused must be present at all hearings during the presentation of evidence and the accused has a right to question the accuser and any witnesses and make a statement to the Council.
3. Legal counsel will not be allowed for any party at a hearing, but the accused may have present a character witness or non-legally trained faculty adviser if he or she so chooses.
4. Any member of the Honor Council related by birth or marriage to the accused or the accuser or who has any other personal interest in the hearing shall relieve himself/herself from participation in that hearing.
5. The proceedings of the hearing are confidential. Any member present at a hearing is not at liberty to discuss its proceedings with anyone other than the members of the Honor Council present at the hearing or other persons with a legitimate need to know, e.g., law enforcement agents.
6. In the event a hearing concerns a charge against a graduate student, a medical student or a faculty member who is in a supervisory role for any Honor Council members, those members shall recuse themselves from participation in the hearing.
7. Upon completion of the review of evidence, the Honor Council in closed executive session shall reach a decision of “guilty” or “not

guilty” of violation of the Honor Code by simple majority vote. The Honor Council shall make its determination using an evidentiary standard of “beyond a reasonable doubt.” The co-chairs have a vote in all decisions unless contraindicated by *Roberts Rules of Order*.

7. Written notice of the Honor Council decision will be sent to the accused and to the dean of the School of Medicine. The dean will also receive the vote count, a written summary of the case, and an oral report of the case from the co-chairs. The Promotion Committee will not be notified unless a verdict of “guilty” has been found. In the case of a “guilty” verdict, the Promotion Committee will receive a written summary of the proceedings. The written summary also will be kept in the permanent records of the Honor Council.
8. When the Honor Council reaches a decision of “guilty,” the penalty, representing the majority opinion of the Honor Council, shall be sent to the dean of the School of Medicine. The recommended penalties should conform to the severity of offenses and may include expulsion from the School of Medicine, and may also include lesser penalties such as failure of a course, or suspension for a designated period of time.

Article VIII—Publicity

1. Each new student entering the School of Medicine will be informed by the Honor Council as to the functions of the Honor System and his or her obligations to the Honor Code. Each student will be provided a copy of the Constitution and Bylaws of the Honor System and the Honor Code.
2. At the commencement of each academic year, all students shall reaffirm their commitment to the honor system by signing the Honor Code.
3. Names of the members of the Honor Council will be made known to all students upon commencement of each academic year. The Honor Council members will be accessible to any student to address concerns or questions regarding protocol, violations, or other Honor Council issues.
4. All written examinations will include a blank space where students will be required to freehand write the statement, “I continue to abide by the Honor Code.” The student must sign below the statement. All written examinations must contain the student’s written statement and signature to be considered complete.

Article IX—Miscellaneous

In case a student withdraws from the School after a charge has been made against him or her and before the hearing, the Honor Council shall record the facts and the accused shall not be allowed to re-enter until he or she has had a hearing before the Honor Council.

Article X—Amendments

Amendments to this Constitution shall require for their adoption the approval of a majority of the total membership of the Honor Council and ratification by a majority of the voting student body. These amendments must be approved by the dean of the School of Medicine and the faculty adviser before becoming final.

Bylaws

Article I—Reporting an Incident

1. If a student or an instructor has reason to believe that a breach of the Honor Code has been committed, he/she must, within seven class days, report the incident in signed written form in one of the following ways:
 - a. Directly to one or both of the co-chairs of the Honor Council, or
 - b. By way of the faculty adviser who will notify the co-chairs of the Honor Council, or
 - c. To any member of the Honor Council, who will report directly and only to either the co-chairs or the faculty adviser.
2. Failure to take action on an incident is a breach of the Honor Code. Students are required to report in writing any suspected violations of the Honor Code.

3. Once an incident is reported, it shall be the responsibility of the Honor Council, not the student or instructor, to investigate the incident and determine the next course of action. The student or instructor who reports a violation is charged with maintaining confidence of his or her accusation; the accused is also required to maintain the confidence of the accusation and the hearing. Such confidence can be broken only as required in response to law enforcement agencies and to assure access to appropriate advice.
4. Perjury before the dean or any Honor Council member regarding the reporting of or investigation into an incident is a breach of the Honor Code and is subject to punishment.
5. Once an incident has been reported, the co-chairs and the faculty adviser will meet to discuss the incident. The co-chairs shall appoint a committee of two members from the Honor Council to investigate the case and report their findings to the faculty adviser and the co-chairs. These two members shall be ineligible to vote in the event the Honor Council is convened. At the conclusion of the investigation, the co-chairs and faculty adviser will then decide whether to convene the Honor Council. If the decision is made to convene the Honor Council, the student in question will be notified that he/she has been formally accused of a violation of the Honor Code. The Honor Council should be convened within ten class days from the initial reporting of the incident. Both the accuser and the accused will be notified of the nature of the charge as well as the time and place of the assembly of the Honor Council.
6. Once the Honor Council is assembled, the accusation will be presented by the co-chairs, and a hearing will be held by the Honor Council.
7. A student who reports his or her own Honor Code violation will be given consideration for his or her initiative in self-reporting the transgression. The co-chairs, with advice of the faculty adviser, will decide if an investigation is warranted.

Article II—Penalties

1. Penalties given to those declared “guilty” will be recommended by the Honor Council and enforced by the dean of the School of Medicine as he/she sees fit. The final decision and penalty will be reported by the dean to the student involved, to the reporting individual, and to the Honor Council.
2. Penalties may range from the minimum of failure of the assignment to the maximum of expulsion from Vanderbilt University School of Medicine.
3. If the violation was committed under extenuating circumstances, the Honor Council may, by a majority vote, recommend a suspension of the sentence. However, suspension of the sentence shall in no way alter the findings of “guilt” under the Code.

Article III—Appeals

- Appeals to any final actions that result from Honor Council hearings can be made with a petition to the Vanderbilt University Appellate Review Board as follows:
- a. The appeal petition must be in writing.
 - b. It must specify the grounds for appeal.
 - c. It must be filed within seven class days of the original notification of the verdict or within two weeks if school is not in session for seven days following the notification.

Article IV—Summer Honor Council

1. The Summer Council will have official functions from the day following university Commencement exercises until the day class registration begins for the fall semester.
2. In the event that a designated member will not be in Nashville during the summer, the respective class president should appoint a member of his/her class who will be in Nashville, to be approved by the Honor Council.
3. In the event that both co-chairs will not be in Nashville during the summer, then the faculty adviser should recommend a chair from the members of the Honor Council, subject to Honor Council approval.

Standards of Behavior for Interactions with Medical Students¹

Statement of Standards

In practice, physicians are held to high standards of professionalism and patient care. The medical learning environment is expected to facilitate students’ acquisition of the professional and collegial attitudes necessary for effective, caring, and compassionate health care. The development and nurturing of these attitudes requires mutual respect between teachers (including faculty, residents, and staff) and students, and between each student and his or her fellow students.² Mutual respect between student and teacher, and between fellow students, may be expressed in many ways but all interactions shall include honesty, fairness, and evenhanded treatment. Behavior which is inimical to the development of mutual respect shall be prohibited. Such behavior may include but is not limited to:

- (1) Harassment of a sexual nature;
- (2) Discrimination or harassment based on race, sex, religion, color, national or ethnic origin, age, disability, military service, sexual orientation, or gender identity.
- (3) Grading, promoting, or otherwise evaluating any student on any basis other than that student’s performance or merit.

¹ All Vanderbilt University policies concerning medical student interactions with faculty and staff as set forth in the Vanderbilt University *Student Handbook*, the *Faculty Manual*, and the *Staff Manual* remain in full force and effect.

² By their express terms, these Standards apply only to interactions which involve one or more medical students; however, it is hoped that these Standards will serve as a guide to all members of the Vanderbilt University School of Medicine community. The reporting procedure outlined herein shall apply only to allegations of the violation of these Standards in interactions involving medical student(s).

Comments

The following delineates more clearly the behavior enumerated above which may be inimical to the development of mutual respect between students and teacher and between fellow students. For purposes of these Comments, the term “person” shall refer to a student in interactions between fellow students or, in student-teacher interactions, to the student or teacher, as appropriate.

- (1) Harassment of a sexual nature may include:
 - a. Denying the opportunity for training or rewards because of a student’s gender;
 - b. Requesting sexual favors in exchange for grades or other awards;
 - c. Making unwanted sexual advances;
 - d. Unreasonable and inappropriate sexual or sexist conduct directed towards any person;
 - e. Displaying in an unreasonable and inappropriate manner sexually suggestive or pornographic materials; or
 - f. Grading or evaluating a student based upon gender rather than performance and merit.
- (2) Discrimination and harassment may include:
 - a. Denying the opportunity for training or rewards because of a student’s age, race, religious affiliation, or any other attribute of the student other than merit or performance;

- b. Unreasonable and inappropriate conduct directed towards any person which is intended to insult or stigmatize that person;
- c. Exclusion of a student from any usual and reasonable expected educational opportunity for any reason other than as a reasonable response to that student's performance or merit;
- d. Requiring a student to perform personal services such as shopping or babysitting;
- e. Showing favoritism among students based upon any attribute of the student(s) other than performance or merit and thereby reducing educational opportunities available to the nonfavored student(s); or
- f. Grading or evaluating a student based upon any attribute of a student other than that student's performance and merit;
- g. Any physical mistreatment, such as hitting, slapping or kicking, or threatening such physical mistreatment;
- h. Requiring a student to perform menial tasks with the intent to humiliate the student.

Any perceived violation of these Standards of Behavior ("Standards") should be reported in accordance with the following procedure. Violations of these Standards may subject the offender to disciplinary action. These Standards may be amended at any time by the Executive Faculty. The Standards Committee shall be composed of such members as the dean shall appoint from time to time. In cases where there is a potential conflict between the standards and university policy, university policy will prevail.

Reporting Procedure

When a student feels that he or she has been mistreated, the student is encouraged to report the incident to the medical school's ombudsman. The ombudsman is introduced to the students during orientation and is not a member of the administration, nor a director of a major medical school course. When the mistreatment involves an allegation of discrimination and/or harassment, including sexual misconduct and/or intimate partner violence, the ombudsman must report the incident to the Vanderbilt University Equal Opportunity, Affirmative Action, and Disabilities Services Department (EAD). If there is a report of sexual misconduct and/or intimate partner violence involving a student, the Sexual Misconduct and Intimate Partner Violence Policy, which can be found in the Vanderbilt University *Student Handbook*, applies to all Vanderbilt students, including medical students. Please consult that policy for more information.

The ombudsman carefully reviews each incident with the student and develops an action plan accordingly. Students are fully protected from retaliation in all cases. The ombudsman has the full support of the medical school administration in handling these delicate matters.

Vanderbilt University School of Medicine Compact Between Teachers and Learners

Preamble

As a community of teachers, learners, physicians, and physicians-in-training, we acknowledge the fundamental importance of our professional values in creating and maintaining an environment that promotes the highest standard of learning and the highest quality of patient care. The following principles characterize this environment and guide us in making daily decisions: **Respect, Service, Integrity, Accountability, Scholarship, and Compassion.** Recognizing that in an academic community we are teachers and learners simultaneously, we make the following commitments with the understanding that each applies to all of us, regardless of our status as faculty, resident, or student.

Commitments of Teachers

- We will respect students, colleagues, staff and patients as individuals.‡
- We will strive to provide the highest quality instruction, by preparing adequately for all teaching sessions, using evidence-based content, arriving on time, and admitting any gaps in knowledge. We will strive for continuous improvement in our teaching efforts by responding to feedback and evaluation.
- We will demonstrate respect for our learners by turning off cell phones and silencing pagers during sessions we teach, unless they are required for service responsibilities.
- We will clearly express learning objectives for all courses and teaching sessions, and understand how these promote the learning objectives of the school. We will clearly define any specific academic and behavioral expectations for our classes.
- We will be aware of institutional and national policies, such as duty hours, and make sure that our expectations are consistent with those policies.
- We will not demand that our learners take actions that are inconsistent with professional ethics. We will assign tasks that are appropriate for stage of learning, level of responsibility, and status as students. If an assigned task conflicts with the personal ethics of a learner, we will discuss this with the student and attempt to resolve the conflict in a manner that respects the student while placing priority on the interests and well-being of the patient.
- We will recognize the responsibilities implicit in our roles as mentors and coaches, and in the spirit of cultivating excellence in our learners, provide timely and constructive feedback.
- We will recognize our status as role models, and in our interactions with patients, staff, and students, we will exhibit the same standard of professional behavior that we expect from others.
- We acknowledge that the teacher-learner relationship is a model for the doctor-patient relationship, and will strive to know our students as individuals, answer their correspondences promptly, exercise concern for their well being, and treat them with compassion.
- We will respect the intellectual property of others and will use online resources, such as VSTAR, in a manner that is consistent with that respect.

- We will demonstrate honesty and integrity in all academic endeavors, including examinations, research efforts, and patient care entries.
- We will strive to create a culture of safety. This culture includes evaluation for disclosure, event analysis, and process change when a safety concern is identified.

Commitments of Learners

- We will respect students, colleagues, staff and patients as individuals‡
- We will strive for excellence in attaining the knowledge, attitudes and skills needed for the highest standard of patient care.
- We will attend all learning sessions designated as required by our teachers, which will include all patient presentations and small group sessions. We will demonstrate respect towards teachers and peers by arriving on time, turning off cell phones, silencing pagers, and complying with other specific expectations defined by the faculty.
- We will wear appropriate attire. In the classroom setting, it should not cause distraction and in the presence of patients, whether in classroom or clinical settings, it should comply with patient expectations and the standards published by the institution.*
- We will work effectively in teams, respecting the contributions of all members, assuming a fair share of responsibility, and performing leadership tasks with a sense of service to others.
- We will acknowledge and seek help when an assigned clinical task is beyond our level of skill. If an assigned task conflicts with personal ethics, we will discuss this with the supervising physician and strive to reach a resolution that places priority on the interests of the patient.
- We will recognize our obligations as a collegial community, sharing knowledge and assisting peers in their quest to achieve professional and personal goals. We will assist our colleagues in distress.
- We will establish the habit of critical reflection, acknowledge gaps in our knowledge, recognize our limitations, and strive for constant self-improvement.
- We will respect the intellectual property of others and will use online resources, such as VSTAR, in a manner that is consistent with that respect.
- We will demonstrate honesty and integrity in all academic endeavors, including examinations, research efforts and patient care entries.
- We will strive to create a culture of safety. We will accept responsibility for errors and near-errors by disclosing them, analyzing them and implementing changes that would prevent similar events in the future.
- In the spirit of continuous quality improvement, we will accept the responsibility of constructive evaluation of our courses and teachers.

Acknowledgements

This document draws heavily from the following sources:

1. Association of American Medical Colleges, Compact Between Teachers and Learners of Medicine.
2. National Board of Medical Examiners, Center for Innovation, The Behaviors of Professionalism.
3. ABIM Foundation, ACP-ASIM Foundation, and European Federation of Internal Medicine, Medical

Professionalism in the New Millennium: A Physician Charter, *Annals of Internal Medicine*, 136:3, 243-6, 2002.

‡ In compliance with federal law, including the provisions of Title VII of the Civil Rights Act of 1964, Title IX of the Education Amendment of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act (ADA) of 1990, the ADA Amendments Act of 2008, Executive Order 11246, and the Uniformed Services Employment and Reemployment Rights Act, as amended, and the Genetic Information Nondiscrimination Act of 2008, Vanderbilt University does not discriminate against individuals on the basis of their race, sex, religion, color, national or ethnic origin, age, disability, or military service, or genetic information in its administration of educational policies, programs, or activities; admissions policies; scholarship and loan programs; athletic or other university-administered programs; or employment. In addition, the university does not discriminate against individuals on the basis of their sexual orientation, gender identity, or gender expression consistent with the university's nondiscrimination policy. Inquiries or complaints should be directed to Anita J. Jenious, J.D., Director; the Equal Opportunity, Affirmative Action, and Disability Services Department; Baker Building; PMB 401809, 2301 Vanderbilt Place; Nashville, TN 37240-1809. Telephone (615) 322-4705 (V/TDD); FAX (615) 343-4969.

*Vanderbilt University Medical Center dress code may be found online, at <https://vanderbilt.policytech.com/docview/?docid=410>

Competencies for Learners across the Continuum

The following set of core competencies was adopted by the Undergraduate Medical Education Committee in 2009 and updated in July 2012. These competencies represent goals for medical education across the continuum, and while it is expected that students will be able to demonstrate some degree of mastery in all of them by the time of graduation, it is not expected that all graduating students will be expert in all of them. These core competencies are based on the six ACGME competencies that guide learning throughout postgraduate medical education.

I. Medical Knowledge

Physicians must understand established and evolving biological, clinical, epidemiological and social-behavioral sciences and must be able to apply this knowledge to patient care.

Learners will be able to:

- MK1. Explain the biological, behavioral and social factors that promote health or predispose individuals to illness, and how these may be used in partnership with patients to predict, prevent or mitigate the onset of disease.
- MK2. Demonstrate deep knowledge of the sciences essential for one's chosen field of practice.
- MK3. Demonstrate knowledge of the sciences that support other specialty fields as they relate to one's own practice.
- MK4. Demonstrate knowledge of the sciences underlying the common and important health and wellness issues affecting our society and other societies around the globe.
- MK5. Demonstrate an appreciation for the importance of the sciences that underlie the effective practice of medicine and the resulting commitment to maintain an up-to-date fund of knowledge through continuous learning.
- MK6. Apply knowledge of the scientific method, reproducible research, and experimental design in evaluating questions of interest.
- MK7. Collect, analyze, and interpret new information to enhance knowledge in the various disciplines related to medicine.

II. Patient Care

Physicians must consistently provide care that is compassionate, culturally competent, safe, efficient, cost sensitive, appropriate, and effective for the treatment of illness and the promotion of health. Learners will be able to:

- PC1. Perform a problem-focused or complete history and physical examination as indicated, and to obtain necessary diagnostic studies, including imaging, laboratory and procedural tests.
- PC2. Interpret clinical information and formulate a prioritized differential diagnosis that reflects the use of medical knowledge in a probabilistic reasoning process.
- PC3. Formulate a management plan based on evaluation of the scientific evidence as well as on the patient's values, cultural background, beliefs and behaviors; critically review the literature with an understanding of the levels of evidence provided by typical experimental or study designs, measurement techniques, and analyses; recognize common forms of bias.
- PC4. Implement a comprehensive management plan that would include performing indicated procedures within the scope of one's training
- PC5. Utilize knowledge support tools such as evidence-based diagnostic criteria, management guidelines and point-of-care information resources.
- PC6. Utilize informatics and health information technology in support of patient care in a manner that reflects understanding of their capabilities, limitations, benefits, and risks. Examples include the electronic health record, computerized physician order entry, decision support systems and messaging systems.
- PC7. Demonstrate clinical judgment that is safe and commensurate for the level of training.
- PC8. Re-examine and address prior decisions when desired outcomes are not achieved and/or the patient is dissatisfied.

III. Interpersonal and Communication Skills

Physicians must be able to communicate in ways that result in safe, culturally sensitive, effective and respectful information exchange and create beneficial partnerships with patients, their families, and other health professionals. Learners will be able to:

- ICS1. Discuss the enduring value of effective relationships and the factors that can facilitate or impede their formation, including power imbalances and social, economic, and cultural differences.
- ICS2. Demonstrate sensitivity to the diversity with which people perceive, think, learn, communicate, and make decisions, both individually and in groups, and an understanding of how these processes might be impacted by illness.
- ICS3. Explain the elements of a validated provider-patient communication model, and demonstrate appropriate components of the model during patient interactions.
- ICS4. Discuss the strengths, limitations and appropriate applications of various communication modalities, and utilize verbal, non-verbal, written, electronic, graphic, synchronous, and asynchronous modalities in appropriate ways.

- ICS5. Discuss the challenges and opportunities created by cross-cultural communications and their potential impact on patient care, health disparities and health outcomes, and engage support systems that facilitate cross-cultural communication.
- ICS6. Discuss the elements of effective team building and utilize appropriate techniques to create, participate in, and lead effective teams.
- ICS7. Establish and utilize effective communication strategies with patients, families, and healthcare colleagues, regardless of their cultural background.
- ICS8. Build and sustain effective relationships in a wide variety of settings and with persons from diverse backgrounds.
- ICS9. Effectively manage interpersonal conflict and provide and receive constructive feedback.
- ICS10. Disclose medical error to patients, families and health care providers in a manner that is truthful, sensitive, responsible, constructive and supportive.

IV. Professionalism

Physicians must possess the knowledge, skills and attitudes necessary to carry out professional responsibilities, adhere to ethical standards and establish and maintain productive, respectful relationships with patients and colleagues. Professionalism applies to formal and informal interactions in education systems, in health care practice settings, and in the wider community. Learners will be able to:

- PR1. Discuss the duties and obligations of the medical profession, its health care institutions and its individual practitioners to patients, communities and society.
- PR2. Place the primacy of the patient in all health care endeavors.
- PR3. Work for a more just health care system, including the ability to advocate effectively on behalf of individual patients and patient populations.
- PR4. Discuss the principles of biomedical ethics and apply these principles in practical contexts.
- PR5. Demonstrate honesty and transparency in all dealings with patients, learners, and colleagues.
- PR6. Comply with the professional and legal standards that safeguard patient confidentiality.
- PR7. Discuss the concepts surrounding conflict of interest and competing priorities; identify and manage these in ways that maintain the primacy of patient interests and the health of the public.
- PR8. Demonstrate compassion and respect for all persons regardless of differences in values, beliefs and experiences.
- PR9. Demonstrate awareness of the vulnerability of patients and the inherent power differentials in organizational and interpersonal relationships, and respect the boundaries that define therapeutic relationships.
- PR10. Seek excellence in all professional endeavors.

V. Practice-Based Learning and Improvement

Physicians must be able to continuously improve patient care by investigating and evaluating outcomes of care and by engaging in learning activities which involve critical appraisal and assimilation of scientific evidence and application of relevant knowledge to individual patients and populations. To demonstrate competence in practice-based learning and improvement, each learner will be able to:

- PBLI1. Systematically collect, monitor, and analyze data describing current performance at the individual, team and/or systems levels in an effort to achieve the highest possible quality of care.
- PBLI2. Continuously pursue knowledge regarding best practices and optimal patient outcomes.
- PBLI3. Compare data about current performance at the individual, team, and/or systems level with expected outcomes, and identify and implement the learning strategies needed to improve performance.
- PBLI4. Develop and implement improvement projects using a systematic approach that employs the principles of improvement science.
- PBLI5. Recognize, acknowledge and analyze medical errors and devise system-based strategies that would prevent similar errors in the future.

VI. Systems-Based Practice

Physicians must understand and respond to the larger context and system of health care and effectively call on system resources to provide care that is of optimal value. Learners will be able to:

- SBP1. Explain why health care of optimal value is safe, effective, patient-centered, culturally sensitive, timely, efficient, and equitable.
- SBP2. Explain basic principles of systems science and the ways in which people, processes, technology and policy combine to form systems.
- SBP3. Describe the basic organization of health care systems, including the various relationships between patients, providers, practices, institutions, insurers and benefits managers, community health organizations, federal and state regulators, accrediting bodies, professional organizations, licensing boards, the pharmaceutical and biotechnology industries, and legislators.
- SBP4. Compare and contrast the local systems in which acute patient care and health maintenance are provided, such as emergency departments, outpatient clinics, hospitals, mental health clinics, public health clinics, pharmacies, etc.; coordinate patient care within these systems.
- SBP5. Describe different health professionals' roles and responsibilities within the health care delivery system and maximally utilize the capabilities of all healthcare team members to achieve optimal patient outcomes.
- SBP6. Discuss the key elements of leadership, management and organizational behavior and how these elements apply in teams, healthcare organizations, and society; demonstrate these in one's own leadership roles.
- SBP7. Describe how public health and health policy shape the nature of our healthcare system and discuss how and when clinicians must interact with public health officials and policymakers.
- SBP8. Explain risk, complexity, resilience and related concepts that influence the performance of humans and the systems in which they work.
- SBP9. Design, analyze and evaluate healthcare micro-systems, and propose interventions that will improve quality, safety and cost-effectiveness.

Affiliated Clinical Education Sites

Vanderbilt University Medical Center

Facilities

Vanderbilt University Hospital

Vanderbilt University Hospital (VUH) opened in 1980, with the major addition of the Critical Care Tower in 2009. The hospital is dynamic, growing, and dedicated to meeting the most critical and complex needs of our region, continuing Vanderbilt's more than century-old tradition of offering the best in patient care.

Many patients seen in the hospitals are from states other than Tennessee, with the majority coming from Kentucky, Alabama, and Mississippi.

Adjacent and attached to VUH is Medical Center East, primarily an outpatient services building, but also housing some operating rooms, patient rooms for Labor and Delivery, the Vanderbilt Bill Wilkerson Center and the Vanderbilt Orthopaedics Institute.

The Monroe Carell Jr. Children's Hospital at Vanderbilt

The Monroe Carell Jr. Children's Hospital at Vanderbilt opened as a stand-alone facility in 2004, and is a place of hope and healing for pediatric patients and their families. Recognized as one of the premier children's hospitals in the nation by *U.S. News and World Report* for nine years running, Children's Hospital cares for the sickest patients in the region and beyond.

Children's Hospital is the most comprehensive pediatric facility in Tennessee, providing services including neurosurgery, cancer treatment, trauma care, transplant, and much more. Children's Hospital operates the region's only Level I pediatric trauma unit and a neonatal intensive care unit with the highest designated level of care.

The facility is filled with state-of-the-art equipment and information systems to provide the best treatment for patients. It offers a variety of family accommodations to help fulfill its mission of patient-and family-centered care. In addition, Children's Hospital is a top-ranked teaching and research facility. As a nonprofit organization, the hospital cares for children of Tennessee and surrounding states regardless of their ability to pay.

Vanderbilt Psychiatric Hospital

Vanderbilt Psychiatric Hospital, which opened in 1985, provides inpatient and partial hospitalization services to children, adolescents, and adults with psychiatric and substance abuse problems. Services include 24-hour crisis assessment and a year-round accredited school for children and adolescents.

vanderbilthealth.com/psychiatrichospital

The Vanderbilt Clinic

The Vanderbilt Clinic (TVC), a comprehensive outpatient facility, opened in 1988 and houses more than 100 medical specialty practice areas, the clinical laboratories, a center for comprehensive cancer treatment, and a day surgery center.

Vanderbilt Stallworth Rehabilitation Hospital

Vanderbilt Stallworth provides comprehensive inpatient and outpatient rehabilitation services for adult and pediatric

patients with neurological, orthopaedic, and other injuries, as well as chronic conditions and disabilities. The hospital specializes in treating stroke, brain, and spinal cord injury; multiple traumas; amputations; hip fracture; and other diagnoses. Stallworth is a designated Stroke Center of Excellence and repeatedly exceeds the national benchmarks for patient satisfaction and functional outcomes. This hospital is a joint venture with HealthSouth Corporation.

vanderbiltstallworthrehab.com

Vanderbilt-Ingram Cancer Center

Vanderbilt-Ingram Cancer Center (VICC) is Tennessee's only National Cancer Institute (NCI)-designated Comprehensive Cancer Center providing treatment for both adult and pediatric cancer patients. It is also a member of the National Comprehensive Cancer Network, a nonprofit alliance of twenty-six of the world's elite cancer centers collaborating to improve cancer care for patients everywhere. The Cancer Center unites physicians and scientists in research programs in key areas. VICC is ranked in the top 10 in competitively-awarded NCI grant support.

VICC is one of the few centers in the country with a comprehensive program for cancer survivors regardless of age, type of cancer, or where they received their oncology treatment. The center's clinical trials program includes robust work in Phase I drug development and designation by the NCI for Phase I and Phase II clinical trials.

The center also boasts several donor-supported research initiatives, including the Frances Williams Preston Laboratories established by the T. J. Martell Foundation, the A. B. Hancock Jr. Memorial Laboratory for Cancer Research, and the Robert J. Kleberg, Jr., and Helen C. Kleberg Center for Personalized Cancer Medicine.

vicc.org

Vanderbilt Kennedy Center for Research on Human Development

The Vanderbilt Kennedy Center strives to improve life for people with disorders of thinking, learning, perception, communication, mood, and emotion caused by disruption of typical development. Its core values include the pursuit of scientific knowledge with creativity and purpose; the education of scientists, practitioners, families, and community leaders; the facilitation of discovery by Kennedy Center scientists; and the translation of knowledge into practice. The center is one of fourteen National Institutes of Health research centers on mental retardation and other developmental disabilities. It has also been named a University Center for Excellence on Developmental Disabilities Education, Research, and Service by the federal Administration on Developmental Disabilities. The center is an interdisciplinary research, training, diagnostic, and treatment institute, embracing faculty and resources available through Vanderbilt University Medical Center, the College of Arts and Science, and Peabody College.

kc.vanderbilt.edu

Vanderbilt Diabetes Center

The Vanderbilt Diabetes Center provides a comprehensive approach to diabetes for patients of all ages that includes all aspects of health related to diabetes. It also offers programs to equip the next generation of caregivers and scholars. Other

programs support the diabetes-related research of VUMC faculty members.

vanderbilthealth.com/diabetes

Center for Experiential Learning and Assessment (CELA)

The Center for Experiential Learning and Assessment (CELA) provides an educationally rich simulation environment for training our students and other health care professionals to practice the highest quality clinical care. Simulation technology has now become a standard for medical education, surgical training, and health care team training. Such programs have resulted in improved performance, quicker response time, and less deviation from practice standards. Healthcare simulators increase trainee confidence and competence, improve patient safety, and can also yield cost and process efficiencies. Our work is grounded in theory-based research and informed by the best educational practices for competent clinical practice. CELA is also instrumental in conducting rigorous research that extends our knowledge and practice of experiential learning and assessment by simulations. The center consists of three programs: the Program in Human Simulations, the Simulation Technologies Program, and the Program in Surgical and Anatomical Simulation. The first program brings the traditional standardized patient methods toward a broader use of simulations involving all aspects of human interaction in medicine. The Simulation Technologies Program emphasizes the sophisticated use of computers, task trainers, virtual reality and mannequin-based technologies to simulate clinical challenges. The Program in Surgical and Anatomical Simulation is possible thanks to cadaveric gifts made through the Anatomical Donations Program. All programs provide both unique and integrated approaches to training our medical students in a safe and effective educational environment.

Rudolph A. Light Hall

Light Hall provides classroom and laboratory space for students in the School of Medicine. It houses the Department of Biochemistry, the Department of Molecular Physics and Biophysics, and the Howard Hughes Medical Institute.

Ann and Roscoe Robinson Medical Research Building

Laboratories and academic space for pharmacology, biochemistry, and molecular physiology and biophysics are housed in the Ann and Roscoe Robinson Medical Research Building. The eight-story building is also home to the A. B. Hancock Jr. Memorial Laboratory for Cancer Research.

Frances Preston Medical Research Building

This building is named in honor of the late Frances Williams Preston, President and CEO of Broadcast Music, Incorporated. This building consolidates the Vanderbilt-Ingram Cancer Center's programs into one primary location on the VUMC campus.

Medical Research Building III

MRB III houses research laboratories, teaching laboratories, research support areas, offices, conference rooms, classrooms, and a greenhouse for research and teaching. It is a joint undertaking of the College of Arts and Science and VUMC.

Medical Research Building IV

MRB IV houses a significant amount of wet lab space and supports continued growth in VUMC research programs.

Medical Center North

The Newman Clinical Research Center, an inpatient orthopaedic unit, and a general-care unit are inside Medical Center North. The complex also houses laboratories and administrative support services for VUMC.

Faculty and administrative offices and research space for medical school departments are in Medical Center North. The original portions of the building were completed in 1925. Since that time a number of connecting wings and buildings have been added.

Vanderbilt Health One Hundred Oaks

This 440,000-square-foot doctors' office suite opened for patient care in 2009 and is designed for easy access off the interstate highway system, abundant surface parking, automated check-in, and integrated services, labs, and radiology. It houses numerous specialty clinics, primary care services, and advanced imaging facilities.

vanderbilthealth.com/100oaks

Vanderbilt Health Williamson County

Vanderbilt Health Williamson County offers more than 250 physicians in practices ranging from primary care to sports medicine, GI, cancer care, imaging, and pediatrics.

vanderbilthealth.com/williamson

Vanderbilt Dayani Center for Health and Wellness

The Vanderbilt Dayani Center is a medically based fitness/health promotion center that specializes in modifying risk factors, for conditions including cardiovascular disease, weight management, stress, sedentary lifestyle, and smoking. It was the first Certified Medical Fitness Center in Tennessee, is closely aligned with the Department of Physical Medicine and Rehabilitation, and serves patient care, research, and education functions within VUMC.

vanderbilthealth.com/dayani

VUMC Strategy and Innovation Office

The Strategy and Innovation Office's mission is to accelerate change in health care. It provides methods for reducing time to results, conducts research through demonstration projects, and supports active learning through sessions that leverage facts during solution design.

mc.vanderbilt.edu/root/vumc.php?site=strategyandinnovation

Vanderbilt Heart and Vascular Institute

The Vanderbilt Heart and Vascular Institute is a comprehensive and integrated program offering diagnosis, treatment, minimally invasive therapies, surgical intervention, disease management, state-of-the-art techniques, and personalized treatment programs to meet each patient's unique needs.

vanderbilthealth.com/heart

Vanderbilt Bill Wilkerson Center for Otolaryngology and Communication Sciences

The Vanderbilt Bill Wilkerson Center is devoted to comprehensive patient care, education, and research in the field of communication disorders and diseases, as well as ailments of the ear, nose, throat, head, and neck.

vanderbilthealth.com/billwilkerson

Vanderbilt Transplant Center

The Vanderbilt Transplant Center, one of the Southeast's largest, is a multidisciplinary alliance of transplant specialists. Each transplant program within the center represents a collaboration of medical and surgical professionals working together in the best interests of the transplant patient.

vanderbilthealth.com/transplant

Graduate Medical Education

Vanderbilt University Medical Center has built a strong reputation as a national and international leader in medical education of health professionals, research in medical science, and patient care. Residency training began at Vanderbilt University Medical Center with just twelve residents in 1925. Now, VUMC trains almost 1,000 house staff in more than 80 accredited residency and fellowship programs.

Residency Training

Students preparing for the practice of medicine usually spend three or more years in residency training in order to be able to sit for the certification examination in their chosen specialty. Such supervised experiences at Vanderbilt cover an incredibly broad range of specialties and allow the learner to gain graduated responsibility with the ultimate goal of independent practice. Vanderbilt attracts highly qualified candidates from diverse backgrounds, ensuring a house staff that is devoted to delivering safe, high-quality patient care, to succeeding in their chosen discipline, and to teaching other learners in the process. As a result, the house staff take their responsibility in medical student teaching as both an honor and a privilege and devote considerable time to the medical students.

In addition to their primary responsibilities at Vanderbilt University Medical Center (including Vanderbilt University Hospital, Monroe Carell Jr. Children's Hospital at Vanderbilt, the Vanderbilt Psychiatric Hospital, and The Vanderbilt Clinic), the residents also work in a variety of other clinical settings across Nashville including the Veterans Administration Hospital, St. Thomas Midtown (formerly Baptist Hospital), and St. Thomas West, with supervision by outstanding faculty in each setting.

Vanderbilt University Medical Center (VUMC) is a major referral center and consequently has a patient population with complex pediatric, medical and surgical problems. The Veterans Administration Hospital, adjacent to VUMC, serves veterans and their families from throughout the mid-south and is an important component of the teaching program. All physicians at the VA Hospital are full-time faculty members of the School of Medicine.

Post-Residency Clinical Fellowships

After residency training, many physicians choose to pursue further subspecialization through a clinical fellowship. Fellows admitted to these programs must have completed an approved residency program. These training programs have as their

goal the training of physicians for practice and certification in a medical subspecialty. As with the residents mentioned above, the fellows are expected to participate in departmental activities related to teaching, clinical services, and research and serve as another outstanding resource for medical student education.

Office for Continuous Professional Development

Vanderbilt University School of Medicine and Vanderbilt University Medical Center recognize a major commitment to the continuous professional development of Vanderbilt and community physicians and others in the health professions. At Vanderbilt, continuing medical education is considered an important part of the continuum of medical education which is initiated in the undergraduate experience, progresses through graduate medical education, and matures in ongoing continuing medical education and continuing professional development. The Division of CME sponsors learning opportunities for physicians and other members of the health care team that will enable them to provide the very best possible care to their patients and perform optimally in their other professional responsibilities as measured by improvements in competence, performance, and patient health status. In 2014, the Vanderbilt University School of Medicine Division of CME was awarded Accreditation with Commendation by the Accreditation Council for Continuing Medical Education (ACCME), recognizing demonstrated engagement with the quality improvement enterprise in a way that supports physician learning and quality patient care.

Vanderbilt has also been recognized by the Multi-Specialty Board of the American Board of Medical Specialties (ABMS) as a certified site for the Maintenance of Certification (MOC) Portfolio Program. The MOC Portfolio Program was established by ABMS to permit institutions such as Vanderbilt to provide support to physicians who are pursuing Maintenance of Certification Part IV projects, thus aligning physicians' performance improvement requirements with the institution's performance improvement goals. The Vanderbilt MOC Portfolio Program is a collaborative effort of the Office of Quality, Safety and Risk Prevention, the Informatics Center, and the Office for Continuous Professional Development.

Inquiries about CME or MOC should be directed to the Office for Continuous Professional Development or to departments and divisions about specific programming.

Other Clinical Education Affiliates

Tennessee Valley Healthcare System of the Veterans Administration

VA Academic Partnership Council for the Department of Veterans Affairs, Tennessee

The VA Academic Partnership Council is the fundamental administrative unit for policy development and evaluation of educational and research programs at the affiliated Department of Veterans Affairs, Tennessee Valley Healthcare System (TVHS). It is composed of senior faculty members of the School of Medicine and others who are associated with TVHS.

Committee Voting Members:

David Raiford, M.D., Chairperson. Suzanne Jené, MBA, V.H.A.-C.M., Co-chairperson. Marquette Faulkner, M.D., Roger C. Jones, M.D., R. Daniel Beauchamp, M.D., Leon Dent, M.D., Brian Christman, M.D., Cynthia L. Johnson, R.N., M.S.H.C.A., NEA-BC, Stephan H. W. Heckers, M.D., Donald Brady, M.D., Don Rubin, M.D., Sam R. Sells, M.D., Duane Smoot, M.D., Nancy Brown, M.D., James Staiger, M.D., David Baker, M.D., Stephen McLeod-Bryant, M.D., Linda Norman, D.S.N., R.N., F.A.A.N., Shahid Ali, M.D., Alphonse Pasipanodya, M.D.

Non-Voting Members:

Ronnie Smith, Bonnie Miller, M.D., Frank Royal, M.D., Jennifer Lipke.

Admission

Doctor of Medicine (M.D.)

Requirements for Entrance

Vanderbilt University School of Medicine seeks students with a strong background in both science and the liberal arts who will have the baccalaureate degree before matriculation. The Medical College Admission Test (MCAT) is required and used along with other observations to predict success in pre-clinical course work.

Vanderbilt University School of Medicine recognizes that the undergraduate academic experience of applicants varies greatly. Therefore, we have made the decision to move away from “requirements” to “recommendations.” The expansive and ever-changing landscape of medicine and its practice necessitates that an applicant have demonstrated competencies in the natural and life sciences, social sciences, and mathematics. These competencies can be met through traditional and/or newly-established interdisciplinary courses of study in an accredited institution of higher learning. The use of AP or other credit is acceptable, but it is strongly encouraged to build stronger competencies through courses taken in college. Although there is no timeframe in which students must meet the above competencies, it is recommended that students have recent exposures to most or all of these areas. Competitive applicants should demonstrate in-depth competency in each of the following areas of study, based on the AAMC-HHMI Scientific Foundations for Future Physicians and AAMC-Behavioral and Social Science Foundations for Future Physicians. Mastery of competencies is reflected by a strong performance in the classroom and on the MCAT, as well as in letters of evaluation.

Biology: Applicants should demonstrate competence in the understanding of molecular and cellular biology, genetics, and how they regulate organ and organismic structure and function. Fields of study analyzing diverse human properties are viewed in a strong, positive light.

Chemistry/Biochemistry: Applicants should demonstrate competence in the basic principles of chemistry as it pertains to living systems. Studies in biochemistry are an exemplary way to prepare students for training in medicine science.

Mathematics/Statistics and Physics: Applicants should demonstrate competence in the basic principles of physics and mathematics underlying living systems. Applicants should demonstrate basic competence in statistics or biostatistics, which is important to understand the quantitative aspects of medicine and biomedical research.

Social Sciences and Communication: It is imperative that the applicant demonstrate competence in the humanistic understanding of patients as human beings and as part of a familial and social structure. In this regard, studies in psychology and sociology are viewed favorably. It is required that the applicant speaks, writes, and reads English fluently.

The faculty of the Vanderbilt University School of Medicine recognizes its responsibility to present candidates for the M.D. degree who have the knowledge and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care. Candidates for the M.D. degree will ordinarily have the broad preliminary preparation to enter postgraduate medical education in any of the diverse specialties of medicine.

All candidates for admission must possess sufficient intellectual ability, emotional stability, and sensory and motor function to meet the academic requirements of the School of Medicine without fundamental alteration in the nature of this program. The senior associate dean for health sciences education, in consultation with the Admissions Committee of the School of Medicine, is responsible for interpreting these technical standards as they might apply to an individual applicant to the School of Medicine.

Recommendations for Entrance

A broad experience in non-science courses is encouraged, especially experience beyond the introductory course level in areas such as English, the humanities, the arts, and the social and behavioral sciences. A major in non-science courses does not affect selection.

Selection Factors

Vanderbilt University School of Medicine (VUSM) seeks to matriculate a diverse group of academically exceptional students whose attributes and accomplishments suggest that they will be future leaders and/or scholars in medicine. To accomplish this goal, VUSM provides a review of each candidate by multiple members of the faculty who are broadly representative of the faculty body. The committee uses a holistic approach to evaluate an array of applicant attributes, including academic excellence, personal characteristics, accomplishments in research, leadership, service to others, contribution to diversity (gender, race, ethnicity, sexual preference, socioeconomic background, geographic origin), and participation in extracurricular activities. A criminal background check is required before matriculation.

Medical College Admission Test

The Medical College Admission Test is given under the auspices of the Association of American Medical Colleges and is required of applicants to Vanderbilt. It is given multiple times each year. Since the examination score is used by medical schools in the selection of applicants, candidates should take the test in the spring prior to the time application is submitted, if possible. Results of the September examination are acceptable, but will delay review of the application until scores are received.

Application Procedure for Admission

As a convenience to the applicant, Vanderbilt University School of Medicine participates in the American Medical College Application Service. All application materials may be obtained online through AMCAS by going to aamc.org. Applications are received online by AMCAS any time after 1 June and before 1 November preceding the anticipated enrollment date the next year.

The Screening Admissions Committee evaluates the initial application received through the application service. Applicants receiving a favorable initial review are invited to submit letters of recommendation and the secondary application. The Interview Admissions Committee evaluates the application materials to decide which applicants will be invited for an interview. Interviews are conducted at Vanderbilt between September and February. The Executive Admissions Committee evaluates the

application materials and interview reports to decide which applicants will be invited to join the entering class. Invitations to join the class are made in December and February.

Vanderbilt does not participate in the Early Decision Program through the American Medical College Application Service and does not have an Early Assurance Program.

Vanderbilt University School of Medicine has ten dual degree programs. For all dual degrees, except the M.D./Ph.D., the first three years are spent in the medical school program. In most cases, after year three, students begin work on their other degree program. Depending on the other program, students may complete the second degree before returning to the medical school. The dual degree program allows students to reduce the period of time required to complete each degree separately, usually eliminating one full year of study. Application is made to each program separately, and admission to both programs is required to enter a dual degree program.

A single application is made to the M.D./Ph.D. program by indicating M.D./Ph.D. degree on the AMCAS application to Vanderbilt University School of Medicine and completing the MSTP secondary application. The application will be reviewed by the MSTP admissions committee.

Transfer Students

Due to Curriculum 2.0, transfer students will no longer be accepted to Vanderbilt University School of Medicine.

Medical Innovators Development Program (MIDP)

Admission

MIDP students constitute a small cohort of students in the M.D. program with individualized content in one of three MIDP translational tracks (imaging, informatics and systems design, and medical devices), as well as generalized content in intellectual property, entrepreneurship, management, and the FDA regulatory process. The program emphasizes multi-disciplinary collaboration with faculty expertise across the schools of medicine, engineering, and business.

Admission Requirements

The MIDP admission process is the same as that for the M.D. program. All prerequisites and course recommendations applicable to the M.D. program apply to MIDP applicants as well. Please refer to the competency-based requirements outlined for the M.D. program. Other requirements for the MIDP program are described below.

1. MIDP applicants must have a doctoral degree in engineering (from among the following fields: biomedical; bio-engineering, electrical, mechanical, computer, industrial and systems, nuclear, or chemical and biological) or applied sciences (from among the following fields: physics, biophysics, medical physics, computer science, applied mathematics, or materials science), with evidence of academic excellence. The doctoral program must be completed prior to matriculation. If conferral of the doctoral degree will not take place until after matriculation, a letter from the registrar or dean of the institution awarding the degree stating that all degree requirements have been met (including approval of dissertation) is required before matriculation.

2. Like traditional M.D. applicants, MIDP applicants will submit three letters of recommendation. However, one should be from a research mentor or work supervisor who

can describe the applicant's potential for and commitment to success as an applied physician-scientist.

3. In addition to the three essays submitted through the MCAS application, MIDP applicants must submit an MIDP-focused essay explaining the reason(s) the applicant is interested in joining the Medical Innovators Development Program, how the MIDP program will help the applicant achieve his or her career goals, and how the goals relate to imaging, medical devices, or informatics. (~500 words)

The MIDP Leadership Team has the responsibility of reviewing MIDP applications for admission and making recommendations to the dean for the admission.

Financial Support

Funding for tuition is provided for those who gain admission to the Medical Innovator Development Program.

Dual Degree Programs

Medical Scientist Training Program (MSTP)

The central goal of the Medical Scientist Training Program (MSTP) at Vanderbilt University is to train leaders in academic medicine. Our program is based on solid clinical and research training and is designed to foster the development of independent scientific careers. We provide students with an integrated curriculum comprising a strong core education in medicine and intensive training in scientific inquiry. Successful completion of the program leads to both the M.D. and Ph.D. degrees. MSTP students come from a diverse applicant pool drawn from throughout the nation and abroad.

MSTP Curriculum

The MSTP is a dual endeavor between the Vanderbilt University School of Medicine and the Vanderbilt University Graduate School. Trainees are required to fulfill all of the requirements for both the M.D. and Ph.D. degrees. Since some competencies for the M.D. degree are met by the graduate school experience, it is possible for MSTP students matriculating July 2013 or after to complete the M.D. program in a total of three years. The MSTP allows both dual and alternating enrollment in the School of Medicine and the Graduate School. MSTP students will typically complete the FMK and FCC phases, exit for graduate studies, then return for a single year in the Immersion Phase.

The cornerstone of the Vanderbilt MSTP is training in scientific inquiry afforded by a rigorous Ph.D. experience. MSTP trainees complete the first two years of the medical curriculum prior to the initiation of research training.

Following completion of two laboratory rotations, trainees select a laboratory and department for graduate studies. This selection is formalized before the end of the second year of medical school. Requirements for successful completion of the Ph.D. degree are the same for all students at Vanderbilt. The Ph.D. thesis must be successfully defended prior to reentry into medical school.

Most MSTP students will begin the third year of medical school in early July with the Clinical Immersion phase of their training.

To facilitate the training of clinical investigators, we developed a distinct track within the Vanderbilt MSTP called the MSTP-Clinical Investigation Track (MSTP-CIT). The

goal of the MSTP-CIT is to provide comprehensive training in science for physician scientists engaged in translational and patient-oriented research. This program is intended for students who enter the MSTP after the third year of medical school or during residency or fellowship.

MSTP Program Activities

There are a number of educational programs developed specifically for the training of physician scientists in the MSTP. A brief summary of the major activities can be found in the Programs and Policies section under Special Program Requirements (page 50 of this catalog).

Financial Support

Funding for tuition and stipend is provided for those who gain admission to the Medical Scientist Training Program. A training grant from the NIH supports about twenty percent of the expenses for the MSTP; the remainder comes from the Dean's Office, basic science and clinical departments, and philanthropy.

Other Dual Degree Programs

M.D./J.D.

Students must apply separately to both the Vanderbilt University School of Medicine and the Vanderbilt Law School and be accepted by both programs to pursue the dual M.D./J.D. degree.

Ideally, students will apply for dual degree status before enrolling in either program. However, medical students may elect to apply for admission to the dual degree program at any time during their first three years in the medical school. Law students who apply to the medical school during their first year in the law program may also be considered for the dual degree.

Dual degree students will complete both degrees in six years, saving one year in school, as medical school ordinarily takes four years and law school takes three.

M.D./M.S. in Biomedical Informatics

Students must apply separately to both the Vanderbilt University School of Medicine and Vanderbilt's Biomedical Informatics Department and must be accepted by both programs to pursue the dual M.D./M.S. in biomedical informatics degree.

Ideally, students will apply for dual degree status prior to enrolling in either program. However, medical students may elect to apply for admission to the dual degree program at any time during their first three years in the medical school.

Dual degree students will complete both degrees in six years, saving one-half year in school, since medical school ordinarily takes four years and the M.S. in biomedical informatics two and one-half years.

M.D./M.Div. and M.D./M.T.S.

Students with interest in medical and divinity degrees will have the opportunity to enroll in one of two dual degree programs. Students must apply separately to the Vanderbilt University School of Medicine and the Vanderbilt Divinity School and be accepted by both to pursue the M.D./M.Div. (M.D./Master of Divinity) or the M.D./M.T.S. (M.D./Master of Theological Studies) degree.

Ideally, students will apply for dual degree status before enrolling in either program. However, medical students may elect to apply for admission to the dual degree program at

any time during their first three years in the medical school. Divinity students who apply to the medical school during their first year in the divinity program may also be considered for the dual degree.

The M.D./M.Div. dual degree program will take a total of six years for completion. This saves one year as the M.D. degree ordinarily takes four years and the Master of Divinity takes three. The Master of Divinity is a professional degree and prepares students for the practice of ministry. This program has a required field education component as part of the Master of Divinity degree requirements. In this program, students will carry 15 credit hours per semester while in the Divinity School.

M.D./M.Ed.

Education is an integral part of medicine. The word "doctor" comes from the Greek word meaning "teacher." Whether a student chooses a career in research or clinical practice, there always will be a need to teach students, patients, and colleagues. Students who choose the M.D./M.Ed. dual degree program may be interested in patient education or in a career in an academic center working in medical education. They also may be interested in leadership positions at the national level that interface with health policy and education. Education will be a large part of prevention in future medical practice.

Students must apply separately to both the Vanderbilt School of Medicine and Peabody College of Education and Human Development and be accepted by both programs to pursue the dual M.D./M.Ed. degree.

Ideally, students will apply for dual degree status before enrolling in either program. However, medical students may elect to apply for admission to the dual degree program at any time during their first three years in the School of Medicine. Peabody students may apply for admission to the M.D. program during their first year in the master's program.

Dual degree students will complete both degrees in five years, saving one year in school, as medical school ordinarily takes four years and the Peabody program two years.

M.D./M.P.H.

Students must apply separately to the M.D. and the M.P.H. programs in the School of Medicine and be accepted by both programs to pursue the dual M.D./M.P.H. degree. Medical students may elect to apply for admission to the dual degree program at any time during their first three years in the medical school.

An important component of the M.P.H. program is a mentored research investigation, which assumes a degree of student independence typically associated with fellowship or junior faculty status. Thus, acceptance into the M.P.H. program will be restricted to students who exhibit this capacity and will require pre-identification of a qualified faculty member willing to serve as the student's mentor.

Dual degree students will complete both degrees in five years, saving one year in school, since medical school ordinarily takes four years and the M.P.H. program two years.

M.D./MBA

Students must apply separately to both the Vanderbilt University School of Medicine and Vanderbilt's Owen Graduate School of Management and be accepted by both programs to pursue the dual M.D./MBA degree.

Ideally, students will apply for dual degree status prior to enrolling in either program. However, medical students may elect to apply for admission to the dual degree program at

time during their first three years in the medical school. Owen students who apply to the medical school during their first year in the MBA program may also be considered for the dual degree program.

Dual degree students will complete both degrees in five years, saving one year in school, since medical school ordinarily takes four years and the Owen program two years. The first three years are spent in medical school. Students spend their fourth year at the Owen School and then spend the fall semester of year five in medical school and the spring semester of year five at the Owen School.

M.D./M.A. in Medicine, Health, and Society

In 2008, the Vanderbilt University Faculty Senate approved a master of arts degree in Medicine, Health, and Society (MHS). The proposal for this fully interdisciplinary degree originated from the Vanderbilt University Center for Medicine, Health, and Society (CMHS), which was established in 2003. The goals of CMHS are to promote the study of health and health care in their social, cultural, and historical contexts, and to explore the interface of bioscience, technology, and the humanities.

In addition to educating outstanding clinicians, Vanderbilt University School of Medicine is committed to developing future leaders and scholars in medicine. We recognize that the current challenges facing health and health care demand leaders and scholars in many areas related to medicine. The M.A. in MHS allows selected students to extend their scholarly interests in interdisciplinary areas, although prior work in one of those areas is not required. The MHS degree provides students with additional knowledge and research experience to prepare them for academic careers focused on the political, social, economic, and cultural contexts of the practice of medicine, as well as on biomedical ethics, patient-provider relationships, and health policy.

Students must be accepted by both the Vanderbilt University School of Medicine and the Graduate School, and acceptance to one program will not ensure acceptance to the other.

Dual degree students will be able to enter the M.A. program after any year of medical school. If students choose to begin their M.A. studies after the fourth year, they will be allowed to delay graduation until after completion of both degrees, as long as they are officially enrolled in the dual degree program. Requirements for the M.D. degree will be the same as those for non-dual-degree students. In nearly all circumstances, students will be able to complete requirements for both degrees in a total of five years.

Other Single Degree Programs in the School of Medicine

Professional Programs in Hearing and Speech Sciences

Doctor of Audiology

The doctor of audiology (Au.D.) is a four-year post-baccalaureate degree which replaced the master of science degree as the requirement for the entry-level *practitioner* of audiology. The doctor of philosophy degree continues to be offered to students interested in becoming teacher/investigators.

The Au.D. program is CAA accredited by the American Speech-Language-Hearing Association. Practicum sites include the Vanderbilt Bill Wilkerson Center, Odess

Otolaryngology Clinic, Veterans Affairs Medical Center, and several hospitals and practices in the metropolitan Nashville area. At present, Vanderbilt's Au.D. program is ranked #1 in the nation by *U.S. News and World Report*.

The Au.D. program encourages applicants with backgrounds in such areas as communication disorders and other health-related professions, biomedical sciences, psychology, and psycholinguistics. All students must possess GRE scores consistent with Vanderbilt standards, a strong record of past academic achievement, a commitment to hearing health care, excellent oral and written communication skills, a willingness to work collaboratively, a strong work ethic, perseverance, and strong organizational and time management skills.

Please visit our website at <https://www.mc.vanderbilt.edu/HSSgraduatestudies> for additional information.

Master of Education of the Deaf

The Department of Hearing and Speech Sciences (DHSS) offers a master of education of the deaf (M.D.E.) degree. This one- to two-year program emphasizes the development of spoken language and auditory skills for children who are able to develop those skills. The DHSS is home to a unique, interdisciplinary approach to teacher training by combining training in audiology, speech-language pathology, and deaf education. The Mama Lere Hearing School in our National Center for Childhood Deafness and Family Communication serves as the professional development school for the DHSS deaf education program. This auditory oral school for children who are deaf or hard of hearing is known for its outstanding work in the areas of speech development, auditory training, cochlear implant habilitation, language, and reading.

Students entering the Master of Education of the Deaf program are required to have an undergraduate degree in deaf education, special education, early childhood education, or general education and must have teacher certification in same. The program will be one year in length (three semesters including summer plus Maymester) for those coming in with a background in deaf education and two years (five semesters including summer plus Maymester) for those with no background in deaf education.

Please visit our website at www.mc.vanderbilt.edu/nccdfc for additional information.

Master of Science (Speech-Language Pathology)

The master's degree program in speech-language pathology (S.L.P.) is administered through the Vanderbilt University School of Medicine and is CAA (Council on Academic Accreditation) accredited by the American Speech-Language-Hearing Association. The program provides clinical education leading to professional certification in speech-language pathology. The 1.5 to 2.0 calendar years (depending on background) covers at least five semesters (45–56 semester hours), including the summer session following the first calendar year of full-time study. Students without a background in communication disorders will require an extra semester. Many clinical opportunities are available throughout the program. The program culminates in a ten-week clinical or research externship at a site of the student's choosing. The program exceeds American Speech-Language-Hearing Association requirements. Cochlear implant, autism courses, and education courses are a part of the curriculum for students with interests in those areas. There is also a thesis option.

Students with backgrounds in such areas as communication disorders and other health-related professions, biomedical

sciences, psychology, and psycholinguistics are encouraged to apply. All students must possess GRE scores consistent with Vanderbilt's standards, a strong record of past academic achievement, a commitment to perseverance, and exceptional organizational and time-management skills.

Further information regarding graduate programs in hearing and speech sciences may be found online at <https://www.mc.vanderbilt.edu/HSSgraduatestudies>.

Professional Programs in Medical Physics

Doctorate in Medical Physics Master of Science in Medical Physics

Medical physics is an applied branch of physics devoted to the application of concepts and methods from physics to the diagnosis and treatment of human disease. Medical physicists are concerned with three primary areas of activity: clinical service and consultation, research and development, and teaching. Clinically, medical physicists are called upon to contribute scientific advice and resources to solve physical problems arising in radiological medical physics. Medical physics research typically involves the development of new instrumentation and technology, the development of new medical diagnostic and therapeutic procedures, and tests using existing technologies. Historically, this type of activity has been primarily in radiological imaging and radiation oncology, but now has a growing breadth of involvement throughout medicine. Many medical physicists not only provide clinical service, but also have faculty appointments at universities and colleges and are responsible for teaching future medical physicists, resident physicians, medical students, and hospital technical staff.

Vanderbilt University offers a professional doctorate in medical physics (D.M.P.) and a master of science in medical physics (M.S.M.P.). Vanderbilt additionally offers a master of science in medical physics (M.S.M.P.) only in passing to D.M.P. students who successfully complete the requirements for the M.S.M.P. during the first two years of the D.M.P. program.

These interdisciplinary programs are administered through the Department of Radiation Oncology and the Department of Radiology and Radiological Sciences in the School of Medicine, and involve faculty and courses from the Vanderbilt University School of Medicine, the Department of Radiology and Radiological Sciences, the Department of Radiation Oncology, the College of Arts and Science, the Department of Physics and Astronomy, and the School of Engineering (Department of Biomedical Engineering).

The D.M.P. program offers tracks in both radiotherapy medical physics and diagnostic medical physics. Degree requirements include 50 didactic credit hours, 6 research credit hours, and 36 hours of clinical training. The didactic hours are completed in years one and two, and the clinical training credit hours and the 6 research hours are completed in years three and four. The clinical medical physics experience gained in years three and four is equivalent to a two-year medical physics residency.

The M.S.M.P. program offers tracks in both radiotherapy medical physics and diagnostic medical physics. Students may select either a thesis option or non-thesis option. Degree requirements for the non-thesis option include 32 didactic credit hours and 6 credit hours of clinical practicum. Degree requirements for the thesis option include 26 didactic credit hours and successful completion of an M.S.M.P. thesis project.

All students and applicants may access this information and more online by visiting our webpages at <https://medschool.vanderbilt.edu/msmp> or <https://medschool.vanderbilt.edu/dmp>.

Other Programs

Master of Laboratory Investigation

The Master of Laboratory Investigation (M.L.I.) program is a five-year program offered by the School of Medicine for Vanderbilt or Meharry staff who have a B.S. or B.A. degree from an accredited institution with a GPA of 2.5, have at least six months of residency at VUMC or Meharry in a research laboratory, and who are nominated by the faculty mentor in whose lab they work with a strong letter of support. The Graduate Record Examination (GRE— no minimum mandatory score) and an interview are required of all applicants.

The mission of the Master of Laboratory Investigation program is to enhance the academic, scientific, and technical expertise of research personnel who will continue to work in an academic research environment; to foster their professional growth; and to improve the career potentials of our brightest and most qualified young researchers who do not wish to pursue a Ph.D.

Please visit our website at https://medschool.vanderbilt.edu/mli/?PROGRAM_ID=236 for additional information.

Master of Public Health

The Vanderbilt Master of Public Health (M.P.H.) is an interdisciplinary program to train research scientists and public health professionals to be leaders and innovators dedicated to improving public health. We offer three tracks: Epidemiology, Global Health, and Health Policy.

The focus of the Epidemiology track is to train research scientists to perform population-based quantitative evaluation. The focus of the Global Health track is to train innovative public health leaders to manage global health initiatives and to contribute to public policy that improves global health. The Health Policy track seeks to provide students the analytic skills necessary for health policy leadership positions in the public and private sectors. For all tracks, candidates with at least two years of relevant health-related experience or advanced health-related training are preferred.

The Vanderbilt M.P.H. is a full-time, two-year (five-semester), Council on Education for Public Health (CEPH)-accredited program. Eligible candidates include those with bachelor's, master's, or doctoral degrees. At least two years of relevant, post-undergraduate professional experience is strongly preferred. During the program, students complete 42 credit hours including core and track-specific courses, a public health practicum, and a thesis in the form of a manuscript suitable for publication.

The M.P.H. program offers a dual M.D./M.P.H. degree in conjunction with the School of Medicine, a dual master of education (M.Ed.) in international education policy with Peabody College of education and human development, and a dual master of arts in Latin American studies with the Graduate School. The five-year dual M.D./M.P.H. degree is offered for students interested in acquiring tools needed to conceptualize and conduct rigorous research studies, those interested in acquiring skills needed to work in international and/or low-resource settings, and those interested in health policy. The three-year dual degree with the M.Ed. program seeks to equip participants for diverse positions in global public health and international

education, thereby bridging two distinct but interconnected sectors. The three-year dual degree with M.A. in Latin American studies offers an opportunity for students to more fully understand and apply alternative solutions to current and emerging health challenges in Latin America and among Latina/Latino populations in the United States. Students interested in the dual degree programs should apply separately to the two programs.

Please visit our website at <https://medschool.vanderbilt.edu/mph> for additional information.

Master of Science in Applied Clinical Informatics

The Department of Biomedical Informatics (DBMI) at Vanderbilt University offers a two-year M.S. in Applied Clinical Informatics (MSACI) degree program. The objective of the program is to provide innovative clinical informatics education for working professionals in the health care field, with graduates assuming leadership roles in the application and innovation of clinical informatics nationally.

At many institutions, the role of clinical informatics (CI) leaders (known as clinical informaticians) has evolved from introducing electronic health records (EHRs) and practice transformation techniques to the effective evaluation and improvement of patient outcomes. Increasingly, local improvements must be integrated into accountable care organizations, clinically integrated networks, and other inter-organization collaborations that emphasize both quality improvement and cost reduction. These factors create a profound need for trained informatics professionals from a variety of clinical and nonclinical disciplines who share a deep theoretical and practical understanding of the care process, informatics concepts, and the changing social, organizational, and economic context in which health care is delivered. Vanderbilt's M.S. in Applied Clinical Informatics is designed to develop leaders who are prepared to advance the science and practice of clinical informatics.

Vanderbilt's MSACI program degree program is an educational pathway to certification for physicians certified in any ABMS-recognized primary specialty through 2017, at which time board eligibility will require completion of a fellowship program in clinical informatics that is certified by the Accreditation Council for Graduate Medical Education (ACGME). The Vanderbilt Clinical Informatics Fellowship program is currently undergoing review and is expected to fulfill this requirement.

The MSACI program is also designed for clinicians who desire rigorous, practical informatics training outside of the CI fellowship (e.g., board-certified and non-boarded physicians, nurses, pharmacists) and professionals from a wide range of disciplines (e.g., information technology, public health, health care policy, business management, research informatics) who contribute and collaborate to promote safe, efficient, and effective health care.

Application Requirements. Applicants must hold a bachelor, master, or doctoral degree. At least two years of relevant, post-undergraduate professional experience, education, or training is strongly preferred. GRE or MCAT scores are required. TOEFL exam is required for applicants whose primary language is not English.

Physician applicants who intend to apply for ABMS certification in Clinical Informatics must have a) graduated from an appropriately licensed medical school located in the United States or Canada, or from a school located elsewhere that is approved by the ABPM; and b) successfully completed

a residency in an ABMS-participating specialty by June 2015, and must be either board-certified or board-eligible at that time.

Applicants are not required to have formal training in Computer Science or a related discipline, but they need to demonstrate a strong interest and aptitude in Clinical informatics. Students without a computational background are encouraged to take at least one introductory-level course in computer science before entering the program.

Master of Science in Clinical Investigation

The Master of Science in Clinical Investigation (M.S.C.I.) program trains investigators in the techniques and processes used in patient-oriented research. This program provides direct, mentored experience in clinical investigation and, through didactic work, provides trainees with a strong foundation in study design, biostatistics, biomedical ethics, clinical pharmacology, human genetics, and assay methods. The program typically takes two years to complete. Graduates successfully compete for grants such as the K-23, Clinical Associate Physician Award, R0-1, and major foundation grants.

Eligible candidates for the M.S.C.I. program include:

- board-eligible physicians enrolled in a fellowship program at Vanderbilt or Meharry Medical College
- residents with protected time for research
- Vanderbilt faculty members with the consent of their department chairs
- Vanderbilt M.D. students after the completion of the first two years of medical education
- postdoctoral Ph.D.'s anticipating a career in patient-oriented research, and
- Ph.D. candidates in the Nursing School anticipating a career in patient-oriented research.

The M.S.C.I. program consists of four components:

Mentored Research Apprenticeship: The core of the M.S.C.I. program will be the completion of a mentored research project. The research must be patient-oriented and involve direct measurements on patient-derived samples or the use of investigational therapeutic or diagnostic techniques. The mentor must be an established physician-scientist with experience in patient-oriented research. Use of the Vanderbilt University Clinical Research Center will be encouraged. The research project will account for 80 percent of the candidate's commitment to the program.

Didactic Work: Candidates must complete 35 credit hours of courses covering the essentials of study design, biostatistics, ethics, drug development, and data analysis. It is expected that course work will comprise 20 percent of the candidate's time commitment. Core courses will be provided in two formats: intense courses that meet three hours each day (e.g., 8:00 a.m. to 11:00 a.m.) for four weeks and courses that can be offered less intensively (two to four hours a week for several months). The course schedule is designed to maximize protected time for patient-oriented research.

Career Path Development: In addition to the formal curriculum, a monthly seminar series, "Clinical Scientist Career Seminars," will permit candidates to meet successful patient-oriented researchers. Topics of discussion will include academic "rules of the road," time management, promotion/tenure issues, grants management, and overall program evaluation. Candidates will hone their scientific communication skills through an annual

presentation at the MSCI Case Studies forum. The directors will host networking events with the candidates, clinical investigators, mentors, and visiting scientists.

Master's Final Project: The candidate will submit a manuscript to a peer-reviewed journal, provide a completed proposal for a federal or major foundation grant, or develop a master's thesis based on his or her research project. Completion of the thesis requirement will be evaluated by a committee composed of the trainee's mentor, two other members selected by the candidate, and the directors of the M.S.C.I. program.

More information is available online at www.medschool.vanderbilt.edu/msci/.

Allied Health Programs in the School of Medicine

Cardiovascular Perfusion Technology

Perfusion involves the study of physiology, pathology, and associated equipment used to support and/or assume the function of the heart and/or lungs during medical procedures. The perfusionist prepares and operates the heart-lung machine and other sophisticated equipment as directed by health care physicians. The perfusionist measures various blood and other parameters to identify appropriate mechanical, pharmacological, and thermal manipulation to maintain tissue viability. To perform these tasks, the perfusionist must have a thorough understanding of the respiratory and circulatory systems and be able to operate complex equipment. Additionally, the perfusionist must be capable of handling stressful situations, pay great attention to detail, communicate effectively, and be willing to stay abreast of new developments in the profession.

While most perfusionists are employed by medical centers, they may also be employed by individual surgeons or perfusion companies. Clinical perfusionists are required to participate in on-call responsibilities at night, on weekends, and on holidays. Perfusionists may also work in educational institutions as teachers and/or researchers. Further, some perfusionists are hired by the industry that manufactures various perfusion-related supplies and equipment.

The Vanderbilt University Perfusion program includes 22 months of clinical and didactic training leading to a certificate in perfusion. The program officials include a medical director, an assistant medical director, and a program director, and clinical instructors who are experts in the field.

Admission Policy

Academic requirements for admission include:

- Bachelor's degree from an accredited college or university
- At least three (3) credit hours of the following courses from an accredited college:
 - Anatomy and/or physiology
 - General biology
 - General chemistry
 - Mathematics (college algebra or higher)
 - Physics
 - Biochemistry, microbiology, organic chemistry, or inorganic chemistry
- One credit hour or more of medical terminology is required (this requirement cannot be waived or satisfied using work experience).

- A cumulative and science grade point average (GPA) of at least 3.0 on a 4.0 scale.
- The Test of English as a Foreign Language test (TOEFL) is required for non-native English-speaking students. A total TOEFL score of at least 88, on the Internet-based version, 570 on the paper-based version, or 230 on the computer-based version must be achieved.
- Graduate Record Examination (GRE) is not required for entry.
- Applicants with prerequisite course work from an institution for which English is not its primary language of instruction must have an official, detailed evaluation of their course work sent to the program from the World Education Services (WES). International applicants who do not provide official documentation of acceptable U.S. or Canadian course and degree equivalency will not be considered for admission.
- Previous health care experience is strongly preferred but is not required for admission to this program.

Application Procedures

Prospective students of the Perfusion program must submit a completed application form. The following materials must be submitted with the application in a single mailing envelope:

1. Three (3) professional references from individuals familiar with the applicant's academic and/or professional experience (include with submission of application).
2. Official transcripts from all institutions of higher learning attended (in sealed envelopes).
3. A non-refundable application fee, made payable to Vanderbilt University. Early submission application fee (November 1) is \$75; late submission application fee (November 13) is \$150.

Early submission application deadline is November 1, 2016. However, applications will be accepted until November 13, with an increased application fee of \$150.

After completion of the application process, qualified candidates will be notified of an invitation to attend a required interview with the Admissions Committee and a tour of our facilities. Interviews require a minimum of two hours of the applicant's time and are conducted in January of each year.

The Admissions Committee reviews all applications for assurance that each candidate meets the requirements for entrance. Interviews are a required component of the application process.

Diagnostic Medical Sonography

The Vanderbilt University Diagnostic Medical Sonography program is dedicated to providing quality education and promoting excellence in the art and science of sonography. The program provides academic and clinical experiences that produce competent and compassionate sonographers with a commitment to the performance of quality imaging and the pursuit of lifelong learning.

Diagnostic medical sonographers must possess the skills and knowledge necessary to think critically during the delivery of such care while performing sonographic procedures. The program is committed to providing the health care system with sonographers who are competent and compassionate critical thinkers with a goal of continuously learning throughout their career.

Admission Policy

Candidates for admission must have a high school diploma, or the equivalent, and satisfy the following criteria (confirmed by submission of official transcripts):

1. Completion one of the following:
 - Graduation from a 2-year or 4-year accredited allied health program in direct patient care and possession of the recognized credential in his/her specialty * (Examples include, but are not limited to: Radiologic Technology, Nursing, Respiratory Therapy, Nuclear Medicine Technology), or
 - Bachelor's degree from an accredited college or university, with a cumulative GPA of no less than 2.5, or
 - Demonstrated eligibility for degree completion through the 3 + 1 option with affiliated universities, which include Austin Peay State University and Middle Tennessee State University.

*Individuals enrolled in prerequisite program at the time of application will be expected to fulfill this requirement immediately upon graduation and eligibility.

2. Post-secondary course work including the following classes**, with a grade of C or better (all must be complete prior to the first day of class):
 - English composition or speech (must be completed at a college or university in the United States)
 - Algebra or college math equivalent
 - General physics (radiographic physics will be accepted)
 - Minimum of two (2) semesters of biological sciences, including one semester of human anatomy and physiology
 - Medical terminology

**Course work completed outside the U.S. must be officially translated into U.S. equivalents by an accepted agency. (This does not apply to English composition or speech, which must be completed at a U.S. college or university.)

Application Procedures

Applications are accepted by the Vanderbilt Allied Health Programs Office. Applications must be postmarked between January 1 and March 31 for admission each academic year. The application and all supporting documentation (listed below) must be delivered to the Allied Health Programs Office in one mailing envelope. The following are required for application:

1. Application form and non-refundable \$50 fee.
2. Official postsecondary transcripts OR official translations in envelope(s) sealed by the institution(s) or translating agency.
3. Resume, including all education, work, and community service experiences.
4. Written documentation that three (3) references were requested and/or completed using the electronic reference survey.
5. Personal essay explaining the applicant's desire for pursuing a career in sonography.

Any applications received with a postmark after March 31 will be processed on an as-available basis. Interviews will be scheduled with qualified applicants each year after the deadline listed.

All qualified applicants are granted a phone interview with the Program Director (under the direction of the Admissions Committee). Top candidates are offered an onsite interview with faculty and staff members from the Admissions Committee.

The following criteria are considered in the evaluation of all applications:

- Overall GPA
- GPA in prerequisite course work
- Reference scores
- Interviews
- Professional potential (comprehensive rating of the applicant's overall preparedness)

Selection: The top five (5) applicants are offered admission, and the next five (5) applicants are offered an alternate position for that year. The Admissions Committee reserves the right to request additional interviews.

Dietetic Internship Program

The Vanderbilt Dietetic Internship Program is a post-baccalaureate supervised practice certificate program. Interns receive a minimum of 1200 hours of supervised practice in clinical nutrition, food systems management, and community nutrition with a concentration in disease management and health promotion. Sixteen (16) interns are selected for the 10-month (44-week) program, which typically runs from August to June of each year.

The Internship Program provides comprehensive supervised practice experiences as a route to eligibility for the national credentialing examination for registered dietitians as well as for licensure in Tennessee. Many states require licensure before an individual is able to practice as a registered dietitian. Please check licensure guidelines for the state in which you plan to seek employment.

The Dietetic Internship Program at Vanderbilt University began in 1929. The program is one of the oldest and most well established programs in the nation, training future dietitians to become leaders and difference makers in the areas of food and nutrition.

Admission Policy

The admission policy for the Dietetic Internship program stipulates the following:

- A baccalaureate degree from a regionally accredited college is required. (There is no minimum grade point average [GPA] for application consideration.)
- Applicants must successfully complete the knowledge requirements and a didactic program in dietetics as stated in the requirements for membership by the Academy of Nutrition and Dietetics.
- Degrees granted more than five years prior to application must be updated through completion of additional course work in MNT/the Nutrition Care Process and food systems management.
- The degree and all course work must be completed before the internship begins. Courses in progress must be successfully completed.

- An official transcript verifying degree was conferred and a verification statement from the didactic program director must be received prior to beginning the internship.
- A personal interview is not required for application/admission.
- The Graduate Record Examination (GRE) is not required for application/admission.

Application Procedures

The Dietetic Internship program uses the online centralized internship application, referred to as DICAS. Applicants may write to or call the Internship program director to discuss any conditions that might involve special accommodation. Applicants may call or visit to discuss the program. There are three steps to completing the application process:

Step 1: DICAS—DICAS may be accessed at <https://portal.dicas.org>. On the DICAS application, applicants are asked to complete a personal statement in 1,000 words or less. Official transcripts from all colleges and universities attended should be sent to DICAS. Students submitting more than one application must use the same individuals as references for each application.

Step 2: Supplemental Application—Submit the completed Supplemental Application form and non-refundable application fee to Vanderbilt University Dietetic Internship Program.

Step 3: D&D Digital—Register online for computer matching, and select Vanderbilt University Dietetic Internship. <http://www.dnddigital.com>

Applications are reviewed by a selection committee that includes internship faculty, preceptors, and current interns. Each member of the committee reviews all internship applications. The application review process is done without discussion. Each committee member ranks each applicant. The collective ranking by committee members determines the ranking submitted to D&D Digital.

Sixteen interns are selected for the 10-month (44-week) program, which typically runs from August to June. Information from applicant calls or visits to the facility is not used to select applicants, nor is preference given to candidates who choose to visit. Discussions with the director regarding special accommodation are not required for admission and will not be considered in the selection process. Appointments are awarded without regard to race, sex, religion, color, national or ethnic origin, age, disability, military service, or genetic information. Marital status, age, and geographic area of the applicant are not considered.

Neurodiagnostic Technology

Neurodiagnostics is the allied health care profession that records, monitors, and analyzes nervous system function to promote the effective treatment of pathologic conditions. Technologists record electrical activity arising from the brain, spinal cord, peripheral nerves, and somatosensory or motor nerve systems using a variety of techniques and instruments. Technologists prepare data and documentation for interpretation by a physician. Considerable individual initiative, reasoning skill, and sound judgment are all expected of the neurodiagnostic professional. The most common neurodiagnostic procedures are Electroencephalogram (EEG), Intraoperative Neuromonitoring (IONM), Long Term Monitoring (LTM), Polysomnogram (PSG), Evoked Potentials (EP), and Nerve Conduction Studies (NCS).

The Neurodiagnostic Technology program includes 22 months of clinical and didactic training leading to a certificate in neurodiagnostic technology. The program officials include a medical director, a program director, and neurodiagnostic supervisors who are experts in the field.

Admission Policy

Applicants must have a high school diploma, but are encouraged to complete one year of college with a concentration in the sciences.

The Neurodiagnostic Technology program is open to all qualified persons, without discrimination with respect to race, color, age, sex, religion, national origin, disability, sexual orientation, or veteran status.

ABRET (Neurodiagnostic Credentialing and Accreditation) published eligibility pathways for EEG technologists in 2013, opening the door for on-the-job-trained techs to take the registry. That pathway is set to expire in 2018. Due to the 2013 pathways, we do admit students who have a high school education but recommend some college credits in the sciences, particularly chemistry and biology.

Articulation agreements with two community colleges enable students to pursue a degree if desired. A certificate from our program will transfer to either of the following colleges for a total of thirty (30) credit hours toward an associate's degree:

Nashville Community College
120 White Bridge Road
Nashville, TN 37209
Phone: (615) 353-3333

Columbia State Community College
1665 Hampshire Pike
Columbia, TN 38401
Phone: (931) 540-2722

Please call the program director for more information on the degree pathway.

Application Procedures

Applicants must submit the following:

- Completed application, with non-refundable \$35 application fee
- Official transcripts from institutions of higher learning
- Three letters of recommendation from employers or instructors
- Interview with the program director to discuss eligibility
- Interview with a panel that will include the program director, the medical director, one of the allied health program directors, and one of the neurodiagnostic supervisors.

The Program Advisory Committee will offer appointments to the program once a year. All participants are evaluated on an individual basis with selection based on the following criteria:

- Transcripts
- Letters of recommendation
- Interview with program director
- Panel interview

Visiting Students (General Information)

Vanderbilt School of Medicine welcomes visiting senior medical students, space permitting, into clinical electives. The visitor must be an enrolled fourth-year medical student in good academic standing at a U.S. medical school. Each approved student must be taking the elective for credit from his/her own school with his/her dean's approval and must have adequate professional liability and health insurance coverage.

Visiting students may take ACE electives in the School of Medicine, space permitting, with the approval of the appropriate department and with concurrence of the course instructor and the associate dean for medical student affairs. Visiting students should not contact the course directors directly. All inquiries must be made through the Office of Enrollment Services. Failure to apply through this office may result in the student's not being able to take the course.

Students wishing to visit at Vanderbilt School of Medicine should submit a Visiting Student Application through the AAMC Visiting Student Application Service (VSAS). Applications will be processed eight weeks in advance of the requested rotation. For more information on VSAS, visit aamc.org/vsas or contact vsas@aamc.org. Applications are accepted beginning on March 15. A complete application includes a picture, CV, USMLE Step 1 Score, transcript, immunization form, and federal criminal background check report. All accepted students must confirm their participation by submitting a non-refundable \$150 processing fee by check or money order payable to Vanderbilt University School of Medicine. Visitors are also required to participate in an orientation with the Office of Enrollment Services on the first day of their rotation which will include training sessions in Bloodborne Pathogens, Standards of Conduct and HIPAA. Visiting students may not enroll for more than eight weeks of elective work at Vanderbilt without special approval. Complete information about the Visiting Student Program is online at medschool.vanderbilt.edu/enrollment/visitingmed.

Meharry Medical Students

The Vanderbilt School of Medicine has an alliance with Meharry Medical College which allows Meharry medical students to take electives at Vanderbilt, space permitting, at no additional cost. Applications must be submitted through the VSAS application program in the same manner as for other medical students (outlined above).

Osteopathic Students

Students from osteopathic medical schools may apply to Vanderbilt University School of Medicine through VSAS. The same process applies as for medical students (outlined above). Osteopathic students are also required to submit a non-refundable processing fee of \$150 upon approval and placement in an elective course.

International Visiting Students

Vanderbilt School of Medicine accepts a finite number of international visiting medical students during January through June each year. International students are eligible for this program if:

- There are available spaces in existing courses;
- The student is in his or her final year of medical school;

- The student demonstrates proficiency in English as evidenced by the TOEFL score or has been taught in English;
- The student has been nominated by an institution with whom Vanderbilt has an existing collaboration or by a clinical faculty member at Vanderbilt who already has a professional relationship with the student.

International visiting students must pay a \$250 registration fee and \$750 per elective.

Information on the program is on the website at medschool.vanderbilt.edu/enrollment/international-students.

An affiliation agreement must be signed and in place before any domestic or international visiting student may rotate at Vanderbilt. Vanderbilt University School of Medicine has signed on to the AAMC Universal Clinical Training Agreement (UCTA) that was endorsed by the Liaison Committee on Medical Education (LCME). As a participant in this medical school registry, Vanderbilt requires only an implementation letter for any school that has signed on to the UCTA.

Academic Program and Policies

Degree Requirements for the Doctor of Medicine

Candidates for the doctor of medicine must be mature and of good moral character. In accordance with the requirements of the Liaison Committee on Medical Education, they must have spent at least 130 weeks of study as matriculated medical students. The maximum time for enrollment in required M.D. course work is six years, excluding time spent on an approved leave of absence or in work toward another degree.* All M.D. students must:

- Have satisfactorily completed the medical curriculum.
- Have taken Step 1, Step 2CK and Step 2CS of the United States Medical Licensing Examination by the following deadlines: waivers must be approved by ADMSA or ADUME
 - Have taken Step 1 prior to orientation week of the Immersion phase.
 - Have taken Step 2CK and Step 2CS by February 1 of their 4th year/final year of medical school.
- Have no outstanding unpaid balances with the university, other than sanctioned educational loans.

*Any student who exits the M.D. curriculum for approved experiences (research, dual degrees, leave of absence, etc.) will encounter different course options upon return. Requirements for these students will be aligned with expectations in the year of entry by applying the closest equivalent experiences available. Such students must meet with the associate deans of medical student affairs and undergraduate medical education to clarify requirements for their degrees.

Students may not be paid for work performed as part of their elective or required course work for credit. Exceptions to this rule are made only when students are in special programs, such as students on military scholarships, students in funded M.D./Ph.D. programs, and students in the Oral Surgery program when acting as residents. Students enrolled at Vanderbilt University School of Medicine must complete required course work at VUSM or a VUSM affiliate institution, unless otherwise explicitly indicated.

It is the policy of Vanderbilt School of Medicine that students may not be supervised by a parent or family member.

Attendance Policy for Foundations of Medical Knowledge and Foundations of Clinical Care Phases

1. Students will be apprised of the attendance policies for a course on the first day that the class meets. Standards will be provided in writing and in most classes will be reviewed verbally by course directors. It is the student's responsibility to understand which sessions are mandatory, the definitions of excused absences and personal days, and the consequences for unexcused absences.
2. It is expected that students will arrive on time for courses and other school-related obligations and demonstrate respect for teachers, fellow students, and others while participating.
3. Unless stated otherwise, students are not required to attend general lectures in FMK courses. However, because many topics are covered only in lectures and many exam questions are derived directly from this material, attendance in lectures is strongly encouraged.
4. During the clerkships, students are excused from clinical duties so that they may attend clerkship didactic sessions.
 - Students are strongly encouraged to attend unless there is an urgent clinical situation or one that will enrich their education.
5. Student attendance for assigned clinical duty is mandatory. Similarly, student attendance at all classroom sessions that include patients (actual or simulated) is mandatory. These sessions are not recorded by Mediasite or podcasts due to concerns regarding patient privacy.
6. Student attendance at all small group sessions is mandatory. Small groups may include discussion or presentation sessions, team-based or case-based learning sessions, laboratory sessions, etc., as defined for individual courses.
7. Student attendance at all examinations is mandatory. If, due to extenuating circumstances, a student cannot be present for an examination, the student must notify the course administration, the assistant dean for medical student assessment, and the associate dean for medical student affairs immediately. The student will work with course leadership/administration to make arrangements to satisfy the examination requirement. Regarding NBME shelf clerkship examinations, in special circumstances, students may be granted permission to take a missed shelf exam on the standard makeup date (8:00 a.m. on the second Tuesday after scheduled shelf).
8. Student attendance may be required at other sessions, as indicated by the course administration.
9. *Excused Absences from Mandatory Sessions.* Students may be excused from mandatory sessions on the basis of serious health issues, family emergencies, religious holy days, or presentation of their work at meetings (other similar circumstances to be handled on a case-by-case basis). In these circumstances, students must notify in advance the course administration for each active course or clerkship in which sessions would be missed if they will be unable to attend. If the mandatory session is a small group, students also should notify their group facilitator and group mates. If the student will miss clinical duties, he/she must also alert the supervising resident. It is recognized that in some situations students will not be able to provide advance notice. In these circumstances, students should contact the course administration as soon as possible to explain why they were unable to attend.
10. *Foundations of Medical Knowledge Phase Personal Days.* It is recognized that life events that are neither serious health issues nor family emergencies may affect a student's schedule. In these cases, students may request one or more personal days in order to miss a mandatory session. The rules that govern the use of personal days are:
 - Students must notify the course administration for *each* active course in which sessions would be missed in writing and in advance using the appropriate Student Absence Request form. Student Absence Request forms are available online at medschool.vanderbilt.edu/student-affairs/forms.
 - Students who anticipate missing a mandatory small group session due to taking a personal day must notify their group facilitator/clinical team/classmates in advance that they will not be attending.

- Students will be held responsible for material they miss when taking personal days. At the discretion of the course administration, students may have to complete a make-up assignment on material they missed.
 - During the FMK phase, students will be allowed to take up to a total of three (3) personal days (not more than one day per course).
 - *Personal Day Blackout Periods.* Students may not use a personal day to extend a school holiday (not including normal weekend breaks). Also, students may not use personal days to miss mandatory sessions, including:
 - Examinations
 - First day of class
 - Orientation
 - Last day of class before an assessment in a block
 - Other mandatory sessions as determined by course leadership/administration
11. *Unexcused Absences from Mandatory Sessions.* All absences from mandatory sessions that are not defined above as excused or personal days are considered unexcused absences. Unexcused absences are unacceptable and will have a negative effect on the student's competency domain evaluation and/or overall grade in the class.

Student Absence Request forms are available online at medschool.vanderbilt.edu/registrar/forms. Required information includes the date, time, and reason for the absence request. The signatures of (1) the block/clerkship/course director and (2) the assistant dean for medical student assessment or the associate dean for medical student affairs are required.

At the discretion of the senior resident and the attending physician on the ward team, students may occasionally be given time off from clinical duties when working conditions permit. In the event such time off is expected to last longer than 24 hours, a signed Student Absence Request form must be submitted per the instructions above.

Attendance Policy for the Immersion Phase

Introduction

This policy pertains to all mandatory learning experiences (didactic, small-group, clinical, etc.) that take place during the Immersion phase of the VUSM M.D. degree program. Students are expected to attend all required sessions as described in the course syllabus. However, because specific situations may arise where a student may need to miss a required session, the following policy applies.

Planned absence (pre-approval required):

- Interviews
- Religious holy days
- Presentations of work at an advertised external scholarly meeting

Emergency absence (approval required post facto if necessary):

- Serious medical issues
- Family emergencies

Students may submit requests to be absent for other life events, however these absences are highly discouraged and are likely not to be approved, given their impact on both the student learning experience and the clinical learning environment. Students are encouraged to plan their flex months to accommodate these events.

- Weddings
- Family events (non-emergency)
- Any other activities falling on required sessions

Additional Considerations

- Students should not make travel arrangements prior to receiving notification of the outcome of their request. Approval will not be granted just because travel arrangements have been made.
- Unapproved or denied absences will not be allowed.
- Students who are approved to miss more than two clinical days per course must make up the missed clinical time.
- Students will be held responsible for didactic material they miss during approved absences. Make-up work for other activities may be required by course faculty/directors.
- A student cannot miss more than two days, and cannot miss required sessions (see "Required Sessions" below) on a month-long rotation. Students who miss more than two days must make up the additional time (if absence is approved.) If additional absence is taken, but not approved, the student is at risk of failing the course.

Examples of situations in which make-up work will not be allowed, and the student's grade will be affected include:

- Absences for which no request was made
- Absences for which a request was made and denied.

Request Process

Students may request advanced permission to miss required educational activities due to circumstances outlined above. To make such a request, a student must:

1. Request permission from the course director using the VUSM Immersion Phase Absence Request Form at least four weeks in advance of the start of the course.
2. Email the signed VUSM Immersion Phase Absence Request Form to the associate dean for medical student affairs or assistant dean for assessment for approval.
3. Contact appropriate parties regarding the absence (i.e., course director, small group facilitator, peers, FHD course directors, research area heads, and/or supervising clinician, as appropriate).
4. Student will be notified by course leadership regarding required make-up work.
5. Student will be notified by email regarding whether the request is approved or denied.

If the absence is due to a health or family emergency (i.e., less than four weeks in advance), a student must:

1. Contact the course leadership (i.e., course director, small group facilitator, FHD course directors, research area heads, and/or supervising clinician, as appropriate) as soon as possible about the situation.
2. Submit the VUSM Immersion Phase Absence Request Form to the course director.
3. Submit the signed VUSM Immersion Phase Absence Request Form to the to the associate dean for medical student affairs or assistant dean for assessment for approval.
4. Student will be notified by course leadership regarding required make-up work.
5. Student will be notified by email regarding whether the request is approved or denied.

Required Sessions

Absences during/on the following required sessions are likely not to be approved, given their impact on both the student learning experience and the clinical learning environment. Students who miss mandatory educational activities without approval in an Immersion phase course on/during a required session may fail the course. Required sessions include the following, unless indicated by course director:

- First day of class
- Orientation
- Examinations
- Any day that extends a school holiday (except normal weekend breaks if they occur during a course)
- Learning Communities face-to-face College sessions
- FHD monthly face-to-face session
- Research mandatory sessions
- Other sessions as determined by course leadership/administration as described in the course syllabus

Medical Student Duty Hours

In order to encourage a well-rounded, balanced journey through the clinical years of medical school, it is the policy of Vanderbilt University School of Medicine that duty hours of medical students should reflect the general guidelines set forth for residents by the ACGME. We expect that:

1. Total required educational and clinical activities should not exceed eighty hours per week.
2. Clerkship and Immersion phase students should take one day off in seven; this is typically a weekend day..
3. Whenever possible, we suggest that when students take in-house call, they should be allowed to leave at noon of the following day, but should be expected to return for required didactic components of the clerkships or Immersion courses.

It is also expected that supervising house staff and attending physicians will be sensitive to student fatigue and total number of hours spent on clinical and educational activities.

Extracurricular Work or Activities

The School of Medicine does not regulate the outside work or activities of its M.D program students, although it does take the firm position of discouraging outside work. No outside commitments may be assumed by medical students that may compromise their responsibilities at the medical school. If the outside obligation creates a conflict of interest, a student may be required to discontinue it.

Leaves of Absence

A student may request a leave of absence from school for any reason (personal, medical, research, dual degree, etc.), subject to the approval of the associate dean for medical student affairs (ADMSA). The student must submit a written request to the ADMSA, outlining the nature of the requested leave and providing the starting and ending dates. The ADMSA may grant the student a leave of absence for up to one year as long as the student is in good academic standing. Prior to leave, a plan for re-entry into the curriculum and meeting requirements for graduation should be outlined with the ADMSA, with the assistance of the associate dean for undergraduate medical education (ADUME) as indicated.

A student on leave of absence may request an extension of the leave beyond one year, subject to the approval of the

ADMSA. The student must submit a written request outlining the nature of the requested extension and providing a new ending date. A request for extension of a leave of absence must be submitted to the ADMSA at least three months before the ending date of the approved leave. Requests may be made for additional extensions using the process outlined above.

Students who are not in good academic standing may request a leave of absence using the request procedure described above, but approval of the leave may be granted only by the student's Promotion Committee (the request will be presented to the Promotion Committee by the ADMSA).

Students pursuing the Ph.D. as part of the Medical Scientist Training Program are not required to request a leave of absence when entering the Ph.D. phase of the program.

Grading Policy for M.D. Program

The Vanderbilt University School of Medicine has established a series of learning objectives for its medical educational program that are aligned with the competency domains described by the Accrediting Council for Graduate Medical Education (residency requirements): (1) medical knowledge, (2) patient care, (3) interpersonal and communication skills, (4) professionalism, (5) practice-based learning and improvement, and (6) systems-based practice. The ongoing growth of competency in these domains defines the successful development of the physician and occurs during medical school and throughout one's career.

Performance across these domains is assessed in every course and program. In addition to meeting course requirements, satisfactory performance must be maintained in each domain. Significant concern in any domain during a required course or clerkship will be brought to the attention of the student early enough to allow sufficient time for remediation. A student for whom major concern persists despite coaching may be given a failing grade (F) for the course and/or may not be promoted despite satisfactory performance in other categories.

Grading scales

Pass/Fail. Final grades of Pass (P) or Fail (F) will be applied in the following courses:

- FMK: All courses
- FCC: All courses
- Immersion: Electives; Learning Communities; PLAN (Inquiry Program); Foundations of Healthcare Delivery

Honors/High Pass/Pass/Fail. Final grades of Honors (H), High Pass (HP), Pass (P), Fail (F) will be applied in the following courses:

- Immersion: All ACEs, ISCs, AIs, and the Research Immersion project

An H grade will be given to students for superior or outstanding achievement in all aspects of course work and multiple competency domains. Ordinarily, honors grades will be given to no more than 25% of a class.

An HP grade will be given to students with superior achievement in several, but not all, aspects/domains.

A P grade will be given to students who demonstrate satisfactory achievement in all aspects/domains. If any aspect of performance is marginal, this will be indicated by a designation of "threshold" in the domain(s) of concern.

An F grade is given for unsatisfactory work resulting in failure. A student receiving a "below threshold" in any

competency domain, or “threshold” in multiple domains, may receive an F for the course or clerkship.

Temporary grades

P-star. A temporary grade of P* will be given to students whose performance is marginal because of important deficiencies in some aspects of course work which preclude awarding academic credit for completion of that course. The P* grade should only be applied if a plan for remediation, such as repeating an exam, has been put in place. The P* grade may be applicable for academic credit only after that remediation has been completed to the satisfaction of the course director, in which case the P* will be converted on the official transcript to a P. No grade higher than a P can be assigned after such remediation, and the domain(s) of concern will be marked as threshold in the final grade. In the absence of satisfactory remediation, the P* grade will be converted on the official transcript to an F. If a transcript is requested before final resolution, the P* will be present to indicate the course work has not yet been completed at a satisfactory level.

It is at the discretion of each course director whether such remediation options will be available for each course; this will be published in the syllabus. Any remediation plan must be completed in a timely manner: for courses in the Immersion phase, within six weeks of receiving the P* grade; in FCC, within six weeks of completion of the student’s final clerkship block; in FMK, prior to entry into the FCC phase. P* should not be used to indicate performance that is marginal but not considered potential grounds for failure of the course. Such a concern should be indicated as a threshold performance in the relevant competency domain(s). This will then be tracked across courses in the portfolio system. P* should not be used to indicate incomplete work.

Incomplete. A grade of Incomplete is to be used only to reflect that mandatory course work has not been completed (for example, if the student was ill and did not attempt the final exam). Incomplete should not be used when work has been completed but at an unsatisfactory level (i.e., work that requires remediation). Any incomplete course work must be completed in a timely manner: For courses in the Immersion phase, within six weeks of receiving the I grade; in FCC, within six weeks of completion of the student’s final clerkship block; in FMK, prior to entry into the FCC phase. There is no ceiling on the final grading or competency ratings for a student who previously received an Incomplete.

Clinician Assessments of Student Performance

Faculty and house staff providing primary evaluations of student clinical performance may be asked to report (1) behaviors consistently displayed by the student in the various competencies subject to evaluation, (2) narrative comments, (3) judgment of the level of supervision the student requires to complete core tasks, (4) an overall assessment of the student’s performance on service, and (5) an evaluation of suitability for appointment to residency on the service.

Faculty Advisers’ Roles and Responsibilities for Grading

The School of Medicine supports an active advising program for students in every year of medical school. This program supports faculty members who are selected and trained to counsel students regarding academic progress, career direction, and personal well-being. In order to preserve the integrity

of the assessment system and protect students from either real or perceived bias, faculty members who serve in formal advisory roles will not assign summative course or clerkship grades without the assistance of a faculty grading committee. Faculty members who serve as advisers to individual students may provide formative feedback to students as part of other teaching responsibilities. If this feedback is submitted to a course director or grading committee as part of a summative assessment process, the advising relationship will be disclosed.

Student Grievance Concerning Grades

Students should seek redress of a problem with a grade as soon as possible after receiving the grade and in no case later than four weeks after the grade is released. Students with a problem should confer directly with the course director. Every effort should be made to resolve the problem fairly and promptly at this level. If the student cannot resolve the problem through discussion with the course director, the student should formally request an appeal, within two weeks of talking with the course director, from the associate dean for medical student affairs. Appeal will prompt a review of the course’s assessment practices by the Standing Assessment Committee, as well as review of the individual student’s situation by the ADMSA, the ADUME, and a neutral faculty reviewer as indicated. If resolution is still not achieved, the associate dean for medical student affairs will refer the case to the senior associate dean for health sciences education, who will make the final decision.

Expectations for Conduct Regarding Examinations and Work Submitted for Academic Credit

1. In order to create and maintain an academic environment that promotes the highest professional standards, it is important to be transparent in the expectations of all students regarding conduct in examination settings and regarding all work submitted for academic credit. As stated in the Vanderbilt School of Medicine Honor Code, “By demanding great responsibility, the Honor System fosters an environment of freedom and trust that benefits the entire Medical School.” It is the responsibility of the faculty and staff to help protect the trusting environment created when the students agree to and sign the Honor Code pledge.
2. In order to facilitate transparency of expectations, students will be apprised of appropriate conduct for a given course on the first day of class or during the first week that a course meets. Standards of behavior for each course will be published in the course syllabus, and course directors will explain the pertinent points (especially in regards to examinations) verbally as well.
3. It is the student’s responsibility to be aware of and to adhere to the published guidelines for each course.
4. Incidents going before the Honor Council may be incorporated into the competency domain assessment as appropriate.

Expectations for Conduct in NBME Examinations

- “Suspicious behavior” during an exam may be construed as a violation of the Honor Code. Examples include

looking at the work of other students and excessive talking or other disruptions.

- The use of cell phones is prohibited during the examination period, and phones should be stowed outside of the classroom until the examination is completed. Any cell phone brought into the exam room will be collected by the proctor until after the exam. If a student has a legitimate need to be available to urgent outside communications during the assessment period, the student must make the appropriate arrangements with the Office of Undergraduate Medical Education (OUME) prior to the assessment period. An OUME staff member will be designated to receive any urgent communications and will notify the student of outside communications if the need arises.
- Personal belongings may not be brought in the seating area of the testing room. All materials, except computers for online examinations, must be left outside the room or deposited in the area designated for personal belongings. Items listed below are not permitted in the seating area of the testing room:
 - a. Personal digital devices, calculators, or cellular telephones
 - b. Recording/filming devices
 - c. Watches with alarms, computer, or memory capability
 - d. Radios or paging devices
 - e. Reference materials (books, notes, or papers)
 - f. Backpacks, briefcases, luggage, coats, or brimmed hats
 - g. Beverages or food of any type
- For online examinations, students are responsible for confirming device eligibility, working with the educational technology team as needed.
- Students may leave the room only for restroom breaks during the examination. Leaving the room can be disruptive to other students, so it is preferred that students not leave the room unless it is unavoidable. Students will be escorted by a proctor to the restroom, and additional testing time will not be given.
- It is unacceptable behavior to discuss the exam or course materials with others during the exam.
- If a student finishes the exam before time is called, the student should leave quietly and not return to the classroom or immediate outside area until the examination period is over.
- Because students take exams at different times, material covered on exams SHOULD NOT be discussed inside or outside of the examination room during the designated exam period.

VUSM M.D. Student Support and Advising

Vanderbilt University School of Medicine (VUSM) provides comprehensive advising resources to promote student wellness and success in medical school. The advising program provides distinct resources to address the three domains of student life: academic, career, and personal. Students are introduced to the system of advising at orientation prior to entering their first year of medical school. Subsequent discussions of advising resources take place in a number of settings during the first semester of medical school. In addition to the formal advising system, a variety of other resources for student academic support exist, including phase/course/clerkship directors, course self-assessment modules, group study, and optional review sessions.

Students are strongly encouraged to seek assistance and support of various types as needed during training. The abilities to self-identify a need for assistance/support and to reach out to resources are important professional skills, and students are expected to develop these skills during their medical school careers.

Descriptions of major student support/advising programs are listed and briefly described below. Thereafter appears a list of roles that provide support and advising, whether as part of these programs or in addition to them.

Support/Advising Program Descriptions

- VUSM Office for Medical Student Affairs
- VUSM Colleges/Learning Communities
- Portfolio Coaches
- Student Assistance Program
- VUSM-funded tutoring program
- Privately paid tutoring
- Vanderbilt University Psychological and Counseling Center
- VUSM Office for Diversity Affairs
- VU Equal Opportunity, Affirmative Action, and Disability Services Department

VUSM Office for Medical Student Affairs. This office provides resources to support all students. The ADMSA is available for individual meetings and hosts weekly office hours.

VUSM Colleges. All entering students are placed in one of the four Advisory Colleges upon matriculation—Batson, Chapman, Gabbe, or Robinson. Each College is led by two faculty College mentors, with whom students meet regularly in groups and individually, as needed. At these meetings the College mentor and student discuss the student's progress, wellness, and career exploration. In addition to group and individual meetings, the College mentors have weekly office hours, as well as study breaks for students. Students may connect with their College mentors at any time for guidance and support. Although College mentors provide direct teaching in a variety of settings, they do not assign student grades, and College mentors do not make decisions regarding promotion of students from one year to the next. College mentors do not have access to the students' academic records.

Learning Portfolio. Beginning with the entering class of 2013, each student is assigned to a Portfolio Coach and develops a learning portfolio. Students meet with their Portfolio Coaches individually at designated time points to critically review individual performance data and establish academic goals across all domains of competence. Additionally, each student should meet with his/her Portfolio Coach on an as-needed basis to review any specific academic concerns. Refer to the Medical Student Progress and Promotion section of this catalog for a detailed description of the learning portfolio system and portfolio coaches.

Student Assistance Program. This program provides students with guidance in study skills, test-taking strategies, and general advice for academic success. Students may directly contact the Student Assistance Program director regarding academic concerns.

VUSM-Funded Tutoring Program. Tutoring funded by the School of Medicine is available for students who are having serious difficulty academically or who are deemed by the block/course director or the Student Assistance Program Director to be at risk for marginal or failing performance (ordinarily ~75% or less).

Decisions about access to this program and about tutor assignments are made jointly by the block/course director(s)

and the director of the Student Assistance Program. This allows the matching of individual student needs with individual tutor strengths and assures that tutoring resources are distributed appropriately. Generally it is expected that students will have availed themselves of other forms of student academic support (e.g., course self-assessment modules, group study, review sessions, etc.) before entering formal tutoring.

If a student has failing or marginal performance in a block or course, and wishes to obtain a VUSM-funded tutor, he/she must follow these steps:

- a. The student sets up a meeting to consult with the block/course director(s) and/or the Student Assistance Program director.
- b. Once the student's situation has been assessed by the block/course director(s) and the Student Assistance Program director, the appropriate level of tutoring support will be determined.
- c. On assignment of a tutor, the student will contact the assigned tutor to set up tutoring appointments.
- d. The student should also review performance challenges with his/her Portfolio Coach and include the area (s) of concern in his/her Personalized Learning Plan.

Because VUSM-funded tutoring services require no payment from students, those who receive tutoring are responsible for signing a tutoring sheet that confirms that he/she worked with the assigned tutor for the time indicated by the tutor. Tutoring sheets must be submitted by the tutor to the Office of Medical Student Affairs in a timely manner.

The duration of time during which VUSM-funded tutoring services are provided is determined by block/course directors and/or the Student Assistance Program Director. Eligibility for services is reassessed on an ongoing basis once tutoring begins. Individual tutor assignments may be changed or adjusted over time to meet the needs of the pool of students requiring aid.

Important note about VUSM-funded tutoring: In situations where VUSM-funded tutoring has been recommended, and the student decides not to avail him/herself of this service, he/she should be aware that this may be viewed negatively by the Promotion Committee in the context of ongoing academic difficulty.

Privately Paid Tutoring. Students who are performing adequately but wish to seek additional assistance through private tutoring (e.g., from upper classmen) are responsible for arranging for these services and for payment.

The Psychological and Counseling Center. The Vanderbilt University Office of the Dean of Students provides this center, which provides all Vanderbilt students with complete and confidential mental health services. Students experiencing personal difficulties are encouraged to contact the Psychological and Counseling Center, which is on the Vanderbilt University campus (<https://medschool.vanderbilt.edu/pcc/contact-us>). Among its many services, the center offers a reading and study skills specialist to help with time management, test-taking skills, reading skills, and test anxiety reduction.

VUSM Office for Diversity Affairs (ODA). This office provides resources to support students on issues related to disability, ethnicity, gender, religion, and sexual orientation. The many programs in ODA serve individual students' needs and educate the medical school community on diversity issues.

VUSM Advising System—Overview of Faculty Roles

Many individuals provide advising and support to VUSM students. Each of the advising roles at Vanderbilt is defined in a

manner that makes it distinct from, yet complimentary to, the other roles in the system. Each faculty member in an advising role undergoes development on the specific role as well as the overall advising system. The product of faculty development is an advisor who is able to perform his or her advising role responsibilities and is also able to refer students to resources as appropriate to individual student needs.

For names of individuals currently filling each of the advising system roles, please refer to the appropriate section of the VUSM website, at medschool.vanderbilt.edu. Also, see Policy on Multiple Roles (page 48) for more information and for the VUSM Educator Role Matrix referenced in sections below.

Associate Dean for Medical Student Affairs (ADMSA): The ADMSA is a member of the VUSM administration. Her/his primary role is advising on academic, career and personal concerns. The ADMSA has office hours and meets with students in all years of training. The ADMSA is the primary VUSM official designated to write each student's Medical Student Performance Evaluation, but students may request that another school official complete the MSPE. The ADMSA also writes letters of recommendation for students applying for scholarships or various academic opportunities. The ADMSA oversees the Colleges Program, the Student Wellness Program, and the Careers in Medicine Program. The ADMSA has access to all academic records. The ADMSA may not occupy any of the advisory or assessment roles contained in the Educator Role Matrix.

Associate Dean for Undergraduate Medical Education (ADUME): The ADUME is a member of the VUSM administration. Her/his primary role in the medical school involves development and delivery of curriculum and assessment for the M.D. degree. The ADUME has office hours and can meet with students in any year of training to discuss academic and career concerns. The ADUME frequently meets with students who are navigating the curriculum to maximize various academic opportunities. The ADUME has access to all academic records and directs the Promotion Committee process. The ADUME may not occupy any of the advisory or assessment roles contained in the Educator Role Matrix.

Assistant Dean for Medical Student Assessment (ADA): The ADA is a member of the VUSM administration. Her/his primary role is to identify and assist students with performance issues. One of the key roles of the assistant dean for assessment is to direct the Student Assistance Program (SAP). The goal of the SAP is to provide students with guidance in study skills, test-taking strategies, and general advice for academic success within a rigorous medical school curriculum. The ADA serves as an academic resource for students, meeting with individuals as indicated and coordinating tutoring in partnership with course directors. The ADA communicates with the Equal Opportunity, Affirmative Action, and Disability Services Department (EAD) in the event that a student requires accommodation. The ADA helps to coordinate Promotion Committee meetings by preparing the meeting agenda, assembling the academic data to be reviewed, attending all meetings and reporting on student progress/concerns as needed, and following up with students as needed following meetings. The ADA has access to all academic records and is directs the Promotion Committee process. The ADA may not occupy any of the advisory or assessment roles contained in the Educator Role Matrix.

College Mentor (CM): CMs are VUSM faculty members who manage the activities of and advising programs within the VUSM Colleges and Learning Communities. CMs serve assigned students as advisors in the areas of professional

wellness and career counseling. CMs are involved with programming throughout the year in the school's Student Wellness Program and Careers in Medicine Program. CMs also serve as teachers in the VUSM Learning Communities, focusing on content in medical humanities, metacognition, ethics, leadership and policy. The CMs do not grade students in learning communities, but instead provide formative feedback. CMs may have teaching or supervisory roles with their college mentees in the context of other academic activities. However, role conflict management plans are created to ensure that they do not grade their mentees in those activities. CMs do not have access to student academic records (grades, etc.). A student may grant a CM access to his/her academic record and may revoke such permission at any time without negative consequences.

Portfolio Coach (PC): The PCs are VUSM faculty members who work with an assigned group of students throughout medical school. The PC role was created as part of Curriculum 2.0. Each member of an entering class is assigned an individual coach from the cohort of coaches appointed for their class. Students meet individually with their assigned PCs three times during the first year of medical school and at least twice during each subsequent year. Portfolio Coaches play a vital role in the Curriculum 2.0 assessment system. PCs have access to the academic records of only the students to whom they are assigned. They coach individual students in developing the skills for informed self-assessment and lifelong learning. They help students critically appraise data about their performance and translate those assessments into action plans for future learning. PCs have an active role in the assessment of assigned students' progress through the curriculum.

Specialty Adviser (SA): As students approach their senior year of medical school, they are urged to choose an adviser from the specialty in which they will apply for residency. Specialty advisers are VUSM faculty members. Once established, this advisory relationship exists for the duration of the residency application and the National Residency Match processes. SAs provide academic and career counseling, strategic schedule planning, and interviewing advice specific to the specialty of choice. The primary goal of this relationship is to provide students with resources to most effectively obtain a successful residency match.

Limits of Confidentiality

Imminent Harm to Self or Others. Consistent with Federal Law and Vanderbilt University policy, VUSM may release student information normally considered confidential to appropriate individuals (e.g., health care personnel, police, etc.) if such information is necessary to protect the health or safety of the student or other individuals.

VU Policy on Sexual Misconduct. The Vanderbilt University *Student Handbook* includes a Sexual Misconduct and Other Forms of Power-Based Personal Violence policy (vanderbilt.edu/student_handbook/sexual-misconduct/). Students who experience violations of this policy are encouraged to report such incidents. It should be noted that all VUSM faculty members, including those in the VUSM advising system, as well as all VUSM administrators, are not confidential resources (they are known as "Responsible Employees" under Title IX regulations). As outlined in the policy, "Responsible employees are required to report possible violations of this policy to the Title IX Coordinator, including all relevant details about the alleged sexual misconduct, so that the university can take steps to investigate the matter promptly and resolve it fairly.

Conversations with responsible employees are otherwise kept private to the extent possible and are only disclosed to those with a need or right to know."

Policy on Multiple Roles

Many VUSM faculty members hold multiple roles in our education program, and we believe that our students benefit from rich relationships with various supportive faculty members. Just as conflicts arise in the clinical realm, however, faculty members engaged in multiple educational roles can face competing demands, which may directly or indirectly affect (or have the appearance of affecting) an individual's professional judgment in exercising any educator duties and responsibilities.

Of particular concern to students is the intersection of roles involving advising students regarding personal or academic struggles with roles in assessment of student performance or assigning grades. Because not all conflicts can be eliminated, it is necessary to establish a plan for managing and minimizing conflict. To identify and manage potential conflicts, the VUSM administration established a system that defines compatible and incompatible faculty roles within the educational enterprise.

The Educator Role Matrix (vanderbi.lt/rolematrix2016) illustrates roles that have been identified as including some potential for conflict. The matrix places advising roles in one of two categories as they relate to assessment activity: 1) Manageable conflict, and 2) Incompatible conflict. For manageable conflicts (yellow on matrix), the adviser must develop and submit for approval by the senior associate dean for health sciences education a plan of action that mitigates or eliminates the role conflict. The Office of Health Sciences Education maintains records of Role Conflict Management Plans (management plans are available to students upon request). When roles are determined to be incompatible (red on matrix), the faculty member must relinquish either the assessing or advising role.

Authority over this system resides centrally, with the Office of the senior associate dean for health sciences education (SADHSE). Before each new academic year the SADHSE reviews all educators' roles and existing conflict management plans to ensure that they conform to the school's standards. Any new conflict management plans required are completed prior to the commencement of the academic year. Conflict management typically involves ensuring that any individual in an advising role does not serve as the sole assessor of students in any required course. During the academic year, when individuals are proposed for new roles, assignments are reviewed for potential conflicts.

Policy on VUSM Educators Providing Student Health Care

Vanderbilt University Medical Center physicians occasionally provide clinical care for Vanderbilt medical students. Some of these faculty members also teach and assess students in the classroom and clinical setting. Should a situation arise in which a Vanderbilt faculty member finds himself/herself in a dual role as care provider and as a teacher/assessor of a Vanderbilt medical student, he/she must recuse himself/herself from the teaching/assessor role. Examples of such situations include faculty serving as small group leaders in a course or as team leaders within clerkships.

Furthermore, if a Vanderbilt faculty member serves as a course or clerkship director, placing him/her in a teaching/assessor role with all students, he/she should not accept Vanderbilt medical students as patients.

When a student has a pre-existing therapeutic relationship as a patient of a faculty member who directs a course or clerkship, the patient-provider relationship should not be disrupted. In these situations, the faculty member must discuss the situation with the student and arrange for an alternative means of assessment in the course or clerkship. This arrangement would likely involve identifying a different faculty member to provide the assessment in the course or clerkship.

This policy serves to secure and protect the integrity of the learning environment at the Vanderbilt School of Medicine. For questions regarding the implementation of this policy, please contact either the associate dean for medical student affairs or the associate dean for undergraduate medical education.

All medical information contained in the Vanderbilt University Medical Center electronic health record is protected by an electronic firewall. All users accessing the chart of a Vanderbilt student, faculty member, or employee are warned that they are attempting to access sensitive information, and they must indicate the reason for accessing the chart. Viewing patterns are regularly monitored for inappropriate activity.

Medical Student Progress and Promotion

Promotion committees of the faculty, in consultation with representatives of the faculty responsible for instruction, are charged with making recommendations to the dean and the executive faculty regarding progress and promotion of students. The executive faculty of the School of Medicine has final responsibility for the determination of medical student progress in the school.

Students who entered the curriculum in or before 2012, exited the traditional pathway and then return, will follow the promotion procedures applicable to the class with which they are scheduled to graduate; however, as much as feasible, their academic requirements will be aligned with expectations at the time of their entry to school. Such students are expected to confer with the ADUME and the ADMSA to clarify expectations prior to registering for their final year.

Degree and Promotion Requirements

Requirements for the M.D. Degree

LONGITUDINAL REQUIREMENTS

Several curricular elements span all phases of the four years of training.

Foundations of Health Care Delivery (FHD)

FHD is a longitudinal four-year course which embeds students into care delivery systems to:

- Prepare professionals with systems level skills necessary to provide care that is safe, effective, patient-centered, timely, efficient and equitable
- Integrate health systems science with clinical care
- Cultivate respectful professionals

The vision of the course is to offer students a longitudinal experience in which they learn about the systems of health care as well as foundational skills that help them better understand how health systems function, while at the same time gaining important skills to function in and eventually modify those systems. Graduation requirements are detailed at <https://medschool.vanderbilt.edu/fhd/>

Vanderbilt Program in Interprofessional Learning (VPIL)

Students also have the opportunity to apply for VPIL, a two-year course where medical, nursing, pharmacy and social work students work and learn together as a team in a clinical environment. Participation in VPIL allows for medical students to fulfill a portion of their FHD credit required for graduation.

The goals of the program include:

- Cultivate respectful professionals
- Nurture self-directed workplace learners
- Prepare leaders who contribute to a collaborative practice-ready workforce
- Integrate the patient care experience with health professions knowledge
- Improve the health care delivery system by integrating systems knowledge with patient care.

Student teams learn to provide care to a panel of patients under the supervision of multi-professional attending providers. Teams also meet regularly for a variety of classroom-based and simulation activities focused on social determinants of health. Teams discuss cases together, go on a home visit and learn a variety of other clinic based skills that they can accomplish as a team. In their second year, student teams will design and implement a quality improvement project in their clinic and present it at an end of the year Capstone event.

Graduation requirements for students accepted into VPIL are detailed at <https://medschool.vanderbilt.edu/vpil/>

Learning Communities

Learning Communities course work capitalizes on strong relationships within the Colleges, utilizing small group formats to address key elements of professional development. The Learning Communities curriculum includes meta-cognition, medical ethics, medical humanities, health care policy, and narrative medicine, delivered in a discussion-based format. Leadership is also a focus of the Learning Communities curriculum.

Inquiry Program

Research and scholarship are addressed over a four-year curriculum that introduces students to the role of physician-researcher and provides education in the skills, knowledge, and attitudes required to succeed in that role. The Inquiry Program consists of the following components:

- FMK Phase: CASE (Clinical Applications of Scientific Evidence)
- FCC Phase: Discovery
- Immersion Phase: PLAN (Planning, Logistics, and Navigation) and Research Immersion

The research courses in FMK and FCC phases prepare each student to complete a Research Immersion of 3–6 months during the Immersion phase.

Core Clinical Curriculum (VC3)

The Vanderbilt Core Clinical Curriculum (VC3) is based upon a set of 25 common presenting complaints. These topics do not encompass all each student is expected to learn, but do represent core clinical problems that all graduates are expected to know. A set of learning objectives is established for each presenting problem. The VC3 topics are introduced in the FMK phase and continually revisited throughout the curriculum.

PHASE-SPECIFIC REQUIREMENTS

Foundations of Medical Knowledge Phase (FMK)

This phase of the curriculum (54 weeks) provides students a strong foundation in the basic sciences, humanities, and behavioral and social sciences that will support ongoing developmental learning over ensuing years. All students participate in meaningful clinical work during this phase to initiate their development as professionals, to provide clinical relevance for the foundational course work, and to provide an early understanding of health care systems.

Required courses include Foundations of the Profession; Human Blueprint and Architecture; Microbes and Immunity; Homeostasis; Endocrine, Digestion and Reproduction; Brain, Behavior and Movement; Physical Diagnosis; Learning Communities—FMK; CASE (Inquiry Program); and Foundations of Healthcare Delivery/Vanderbilt Program in Interprofessional Learning (FHD1: Continuity Clinical Experience or VPIL1).

Foundations of Clinical Care Phase (FCC)

This phase (41 weeks) provides a strong foundation in clinical care delivery, including core clerkships, clinical electives, and longitudinal programs to support the development of clinical skills and clinical reasoning.

Clerkships. Students rotate through discipline-specific clinical clerkships including Surgery (8 weeks), Medicine (8 weeks), Pediatrics (6 weeks), Obstetrics-Gynecology (6 weeks), Neurology (4 weeks), and Psychiatry (4 weeks).

Ordinarily students will complete all clerkships before proceeding to the Immersion phase, but under special circumstances, students may defer one or more clerkships to pursue specific research or clinical interests. Such plans must be approved by the associate dean for undergraduate medical education. MSTP students who enter the FCC phase after the first clerkship block may defer one block to the Immersion phase, with the permission of the MSTP program director and the associate dean for undergraduate medical education. These students remain accountable for the longitudinal elements of the FCC phase.

Electives. All students are required to take two (2) two-week electives during the FCC phase. These experiences are designed to allow students to explore focused clinical areas and potential career choices. Students may select from offerings across many clinical disciplines. The scheduling of these electives is linked to the clerkship blocks in Pediatrics and in Obstetrics and Gynecology, with the elective immediately preceding the core clerkship.

A student may request an exemption from the elective requirement if she/he has a compelling reason. Reasons may include a need to make up clerkship time, illness requiring treatment, or other unavoidable life events that require the student to be away from school. When the student needs an exemption, she/he must contact the associate dean for medical student affairs (ADMSA) to make a formal request. The decision to grant the exemption is made by the ADMSA. Once an exemption is granted, the student is not required to complete the elective at a later date. The exempted elective will not appear on the transcript.

Master Clinical Teacher Program. Direct observations by a master clinical teacher are required during the FCC phase. MCTs observe students during patient encounters and provide immediate feedback and teaching of advanced clinical skills. The structure and expectations of the observations are consistent throughout the phase; however the logistics and

scheduling of observations are specific to each clerkship. Participation in the MCT process is mandatory and contributes to the clerkship grade and portfolio.

Diagnosis and Therapeutics. This required course runs longitudinally throughout the phase. The course begins with a one-week intensive review of diagnostic approaches and continues throughout the FCC phase with a series of small group meetings aligned with specific clerkships.

The longitudinal elements (Foundations of Healthcare Delivery and, if participating, Vanderbilt Program in Interprofessional Learning, Learning Communities—FCC, Research and VC3) continue during the FCC phase.

Immersion Phase (22 months)

The Immersion phase is a highly individualized experience that allows each student to create a schedule that optimally meets core educational needs, strengthens all competency domains, and builds specialized skill sets aligned with the student's future clinical and scholarly trajectory. Students are required to complete 15 one-month blocks over this 22-month period (including the Research Immersion, described below). Students complete a mixture of experiences with varying levels of structured versus work place learning, including acting internships (AIs), integrated science courses (ISCs), advanced clinical experiences (ACEs), and electives. Requirements for experiences across various care settings (primary care, acute care) and clinical disciplines ensure a broad preparation.

Because the Immersion phase is intended to be individualized, each student must develop a personalized learning plan that is approved by his/her portfolio coach as meeting core requirements. Refer to the School of Medicine website for a full description of the requirements of the Immersion phase (medschool.vanderbilt.edu/ume/IP).

The longitudinal elements (Foundations of Healthcare Delivery and, if participating, Vanderbilt Program in Interprofessional Learning, Learning Communities, and VC3) continue during the Immersion phase. Some of this longitudinal course work is completed while participating in other core rotations. Some content is delivered in Intersession weeks, in which an entire class of students physically convenes.

The Research Immersion, an intensive 3-month scholarly experience, must be completed during the Immersion phase. Students may request an extension of the Research Immersion of up to a total of six months (as a contiguous or non-contiguous block); approval is contingent upon satisfactory progress across all competency domains and will be granted by the Inquiry Program director.

Special Program Requirements

Medical Scientist Training Program (MSTP)

Annual Retreat. The MSTP curriculum begins each year with a day-long retreat scheduled during the week that new students arrive on campus. The retreat provides an opportunity for interactions among MSTP students and faculty with a focus on cutting-edge science. Presentations are made by all students in the graduate phase of training.

Seminar Series. The MSTP Seminar Series is a student-driven, literature-based course in critical thinking guided by the MSTP college advisers. The weekly seminar series is interdisciplinary in scope, with topics drawn from all areas of biomedicine. Students select the manuscripts to be presented

as centerpieces of the seminars. Journal articles are presented in the context of clinical cases to fully integrate topics of medicine and research.

Clinical Preceptorship Program. The MSTP Clinical Preceptorship Program provides our students with exposure to clinical medicine during the period of research training. Each student in the graduate phase is assigned to a clinical mentor in the field of his/her interest for the duration of graduate training.

Data Club. The MSTP Data Club provides a forum for students to discuss current research. All are invited to attend the weekly summer meetings, but the Data Club is particularly designed for graduate-phase MSTP students.

Leadership Workshops. The MSTP Leadership Workshops provide formal training in leadership. The main objectives are to offer students an opportunity to assess their individual leadership styles, discuss cases in research and clinical leadership, and receive didactic instruction in core leadership competencies. The workshops are held biennially.

Career Development Workshop. The MSTP Career Development Workshop provides formal exposure to the variety of career paths chosen by physician scientists. The main focus of the workshop is on the interval from MSTP graduation to the completion of clinical and research training. Panel discussions focus on career options for physician scientists, the transition to independence, and work-family balance. The workshop is held biennially.

Physician Scientist Speaker Series. The Physician Scientist Speaker Series offers an opportunity for students to interact with renowned physician scientists who serve as excellent resources and role models. Speakers are invited by the students each semester to present a research seminar to the Vanderbilt community and give an after-dinner talk to the MSTP class.

Community Outreach. MSTP students direct the annual “Mini-MSTP” for local public school students to promote interest in developing physician scientist careers. Participants are exposed to clinical and research challenges that duplicate real-life events in the hospital and the laboratory. Mini-MSTP events included a visit to the Center for Experiential Learning and Assessment for an encounter with simulation technology, laboratory experiments, and interaction with MSTP students.

Advising Colleges. The Vanderbilt MSTP is organized into four advising colleges that serve as the primary advising mechanism for students in the program. Each advising college is led by three faculty members and includes student members from each phase of the MSTP.

Student Advisory Committee (SAC). The MSTP SAC is appointed annually by the students to provide advice to the MSTP Leadership Team about all aspects of program administration and curriculum. Two-to-three students from each class serve for two-year terms on the SAC. The SAC has been instrumental in MSTP student recruitment and development of several new curricular programs for the MSTP.

Medical Innovators Development Program (MIDP)

In addition to the graduation requirements for the M.D., the MIDP Program requires completion of the following elements:

1. Mentorship

MIDP Forum provides all MIDP students a shared experience offering social and academic support throughout their career in the medical school. The Forum is a student-driven seminar course that is interdisciplinary in scope, drawing its topics from the three MIDP topic areas (imaging, biomedical

informatics, and medical devices). Invited speakers from academia, industry, and regulatory agencies, and entrepreneurs share their expertise in the Forum, and a Forum adviser provides mentorship.

Topic-area mentorship. During the first year, each student is assigned a faculty mentor from the student’s primary topic area (i.e., imaging, biomedical informatics, or medical devices). The goal of faculty mentorship is to provide students with a focused sponsor who helps the student navigate the topic area, address any specific challenge areas, and identify resources the student can leverage to advance their topic-specific educational program. The mentorship is expected to continue throughout the M.D. program.

2. Immersion Translational Design Lab—12 Weeks in Third Year

The goal of the Translational Design Laboratory is to provide trainees with a real-world experience designing a translational solution to an unmet need in health or health care. Students will form teams to address the problems, and have regular meetings with Vanderbilt faculty and, as appropriate, industry advisers. A major emphasis will be to propose practical solutions by leveraging the multi-disciplinary expertise of team members and advisers.

3. Immersion Phase Courses for Training in Business and Entrepreneurship

To become successful applied physician-scientists, students in this program will require focused knowledge about (a) the FDA approval process for medical devices; (b) the role of industry in the informatics, imaging, and/or device spaces; and (c) how synergistic opportunities can develop through academic-industrial partnerships. Two specialized immersion courses provide this content:

- Introduction to Medical Devices and Technology Transfer (IMDTT)—8 weeks in first year of Immersion Phase
- Health Care and Academic-Industrial Immersion Course—8 weeks in second year of Immersion Phase

4. Internship

Each student will have the opportunity to take part in an internship with an industry partner. This engagement will focus on the application, extension, and synthesis of the track into a concrete innovation that has clinical and market value. The choice of industry partner will depend upon the track, experience, and intent of the student. The intended deliverables of this two-month engagement are both a product/innovation/device/novel process and the business model and valuation to support it.

5. Existing courses within the M.D. curriculum

To provide requisite training in imaging, medical devices, and informatics, students are encouraged to pursue relevant course work in the M.D. curriculum, as well as other graduate-level courses in other schools at Vanderbilt University.

Student Progress and Promotion System

I. Assessment Philosophy

The underlying philosophy of the assessment system at Vanderbilt University School of Medicine (VUSM) is that attainment of the knowledge, skills, and attitudes competencies needed for safe, effective, patient-centered care is a developmental process that occurs over many years of education, training, and practice. It is also based on a philosophy of continuous improvement. Therefore, the system is designed to:

- Guide learning with measures that benchmark performance against explicit expectations;
- Promote the skills needed for accurate and reflective self-assessment;
- Direct students to next learning steps and associated learning resources;
- Provide evidence for high-stakes decisions;
- Provide evidence of program effectiveness.

Since the abilities to accurately self-assess and subsequently create appropriate learning goals are also developmental processes, the system provides students with faculty coaches who assist them as they practice these skills in this process. Importantly, the system encourages students to assume increasing levels of responsibility for their own learning.

II. Elements of the Student Progress and Promotion Process

- VUSM Core Competency Domains: Medical Knowledge; Patient Care; Interpersonal and Communication Skills; Professionalism; Practice-based Learning and Improvement; Systems-based Practice; Leadership; and Scholarship.
- Competencies that describe the specific knowledge, skills and attitudes within each core competency domain and the synthetic application of those competencies to perform “entrustable professional activities.”
- Milestones for focus competencies within each domain that describe explicit and measurable behaviors that learners demonstrate as they progress from novice to expert.
- Course and clerkship grades
- Full participation in the portfolio review process, as described below. All formative and summative assessments are gathered in an interactive, electronic learning portfolio and can be sorted by course or by competency domain to facilitate portfolio reviews.

III. Portfolio Reviews

The portfolio review process serves to summarize evidence regarding student performance to direct future learning and to guide decisions of the promotion committees (see below). At times designated on the academic calendar for each phase, students will prepare either formative self-assessments (FSAs) or summative self-assessments (SSAs) that reflect on the current cycle. These self-assessments use a VUSM Core Competency format and are guided by templates in the portfolio.

Students begin their self-assessments by reviewing data accrued for each of the VUSM competencies in a core competency domain. This data will accrue from curricular assessments, and students may enter data that represents extra-curricular activities, such as volunteer work or organizational leadership. For each competency, students will designate a milestone level that describes their consistent level of achievement. Students will assign an overall progress level for each VUSM core competency domain:

For the FMK and FCC phases, these domain progress levels are:

- Below Threshold
- Threshold
- Target

For Immersion phase, these progress levels are:

- Below Threshold
- Threshold
- Target
- Reach

“Below Threshold” indicates failing performance.**

“Threshold” indicates a marginal performance that meets expectations in some areas but not all.

“Target” indicates a performance that meets all expectations.

“Reach” indicates a performance that exceeds expectations for students in that phase.

Because the attainment of competencies is a developmental process, the performance levels that define Threshold, Target, and Reach will progress with the phases of the curriculum.

After assigning a domain progress level for each core competency domain, students must compose the following:

- A brief justification for each level, citing specific assessment evidence. These justifications are guided by prompting questions and must be written for all core competency domains.
- A summary reflection indicating areas of strength, areas for improvement and areas of interest. This reflection will be guided by prompting questions.
- A personalized learning plan (PLP) based on the summary reflection. The PLP will consist of:
 - Learning goals
 - Activities that students will undertake to meet learning goals
 - Metrics that will indicate attainment of learning goals
 - A timeline for achievement

Students must specifically address any core competency domain with a progress level of Threshold or Below Threshold both in the summary reflection and in the PLP.

Students submit self-assessments and PLPs electronically and schedule meetings with the portfolio coaches during specific review periods. Coaches review student portfolios prior to the meetings, and independently designate milestone levels for each competency and progress levels for each core competency domain. At the time of the meetings, coaches and students review assessments, discuss and attempt to resolve any differences in progress level determinations, and review PLPs for appropriateness. The original student self-assessment, the coach assessment, and the report of the joint assessment resulting from the student-coach meeting will be retained in the portfolio. If differences between student and coach interpretations of evidence were not resolved during the student-coach meeting, this will be indicated in the accompanying form.

IV. Promotion Committees

The dean of the School of Medicine will appoint a Promotion Committee (PC) to each of three phases of training (FMK, FCC, Immersion Phase). Promotion Committees will meet regularly to review progress of individual students and the aggregate progress of the cohort of students in its assigned phase.

Each committee will consist of at least eight faculty members who represent a variety of clinical and basic science departments, as well as the broad diversity of the VUSM community. Each member will serve a four-year term, with terms rotating such that half of the committee is replaced every two years. The SADHSE will appoint a faculty chair for each committee, and the ADUME oversees the promotion process. The chair of each committee may determine whether members must be physically present or may participate remotely for any given meeting. Every Promotion Committee member will be assigned a cohort of students to follow throughout the phase. Prior to each meeting, promotion committee members must review the portfolio and learning plan of each assigned student. Promotion Committee members will have complete access to the assessment

evidence in the Learning Portfolios of all students assigned to them to assist in making these determinations.

The associate dean for medical student affairs (ADMSA), associate dean for undergraduate medical education (ADUME), the assistant dean for medical student assessment, the associate dean for diversity in medical education, and the senior associate dean for health sciences education (SADHSE) will be non-voting ex officio members of each committee. In addition, course directors for their respective phases will attend Promotion Committee meetings to provide information about the class as a whole, and to answer questions that committee members may pose regarding individual students. Portfolio Coaches will also attend committee meetings during which any of their assigned students are scheduled for presentation. A quorum of the Promotion Committee shall consist of at least five of the voting members of a committee; however, any proposed dismissal requires the participation of all voting members.

Each PC is charged with making decisions or recommendations as follows:

Satisfactory Progress

Formative reviews will assess whether students are making satisfactory progress towards attaining the achievement levels required for promotion to the next phase, or towards graduation, based on review of the assessment data compiled in each student's portfolio. The Promotion Committees will make a final determination regarding the correct domain progress levels based on the evidence in the portfolio as well as evidence presented during the committee meeting. Any students on probation will be closely re-evaluated during these meetings.

Promotion

Decisions regarding promotion will be made at the end of the FMK phase and the end of Foundations of Clinical Care (FCC) phase. (In view of the integrated and individualized nature of the Immersion phase, meetings during this phase will focus on the academic progress of the individual students, granting eligibility for the national residency matching process NRMP, and certifying eligibility for graduation.)

PCs will determine whether students are ready for promotion based on successful completion of all phase requirements, as evidenced by passing grades in all required courses, and satisfactory progress in each VUSM Core Competency Domain. The Promotion Committee's determination of satisfactory progress in competency domains will be based on review of the assessment documentation compiled in each student's learning portfolio (LP). Students must fully participate in the self-assessment and personalized learning plan (PLP) process in order to be promoted to the next phase.

Eligibility for Special Experiences

All committees may serve a role in recommending students for special opportunities, such as dual degrees or leaves of absence. The Immersion committee will determine students eligible for senior status and participation in the NRMP.

Graduation

The Immersion PC will meet shortly before Commencement for final review of student progress. Students who have successfully completed all required curricular elements and who have demonstrated expected levels of achievement in each VUSM Core Competency Domain will be recommended for conferral of degree. These recommendations will be presented in written form to the dean and the executive faculty for final approval.

Probation or Dismissal

See section VI "Adverse Actions," on page 54 of this catalog.

V. Promotion Committee Meetings

Promotion Committee meetings include two formats: Progress meetings and promotion meetings. Meetings will occur three times during the Foundations of Medical Knowledge (FMK) phase, twice in the Foundations of Clinical Care (FCC) phase, and three times in the Immersion phase. Additional meetings may be called by the ADUME if performance concerns arise regarding any individual student or as needed at the discretion of the ADUME.

Students to be discussed during committee meetings include:

- any student on probation;
- any student with a failing or marginal course grade;
- any student with a domain progress level of Threshold or Below Threshold;
- any case of unresolved differences between student self-assessment and the coach assessment;
- any student seeking special privileges that require committee permissions; and
- other students as deemed necessary by faculty or administration.

If a committee member cannot attend a meeting in person or remotely, he/she will designate another member of the Promotion Committee to substitute. The committee member initially assigned to the student will share with the alternate member any information that he/she may have assembled in preparation for the meeting. Discussion will include input from the student's portfolio coach, course directors, and other members of the committee.

Progress Meetings

The Promotion Committees will make one of the following designations for each student at progress meetings:

1. Satisfactory Progress: Generally for students with progress levels for all domains at Target or Reach and passing grades in all courses
2. Satisfactory Progress with Concern: Generally for students with 1-2 domains at Threshold (regardless of course grades) and/or P* course grade
3. Unsatisfactory Progress: Generally, for students with >2 domains at Threshold, persistent Threshold performance in any single domain over time, or any domain Below Threshold (regardless of course grades), and/or a failing course grade**. Ordinarily these students will be placed on academic probation. (See section on Probation below)

** Any performance deficiency that is serious enough to result in course failure must be attributed to one or more specific competency domains by the course director, which will automatically result in a Below Threshold level in that domain for that portfolio review cycle.

The PLPs for students with designation of "Satisfactory Progress with Concern" or "Unsatisfactory Progress" must explicitly address the domain(s) of concern and be approved by the Promotion Committee; these students must be presented at the next committee meeting to review progress. The Promotion Committee may require additional meetings between the coach and such students during the period between PC meetings. Students who fail a required block, course, or clerkship must repeat that element, or must have an alternate remediation plan that is approved by the course director. The remediation plan must be articulated in the PLP.

In addition, failing Step 1 or Step 2 Clinical Knowledge of the USMLE automatically results in a Below Threshold score in Medical Knowledge and must be addressed in the PLP; failing Step 2 Clinical Skills automatically results in a Below Threshold score in Patient Care and must be addressed in the PLP.

Promotion Meetings

The FMK and FCC Promotion Committees will make one of the following decisions or recommendations for each student:

1. Promotion to next phase
2. Promotion contingent upon authorized delayed completion of specified requirement(s). To support the individualized nature of our curriculum, situations may arise in which it is appropriate to permit special scheduling of educational opportunities. Students in good standing may request such scheduling flexibility through the ADUME. Some students in compliance with approved remediation plans also may be eligible for this action.
3. Promotion on probation
4. No promotion
 - a. Targeted remediation, with later re-evaluation for promotion
 - b. Repeat the phase on probation
 - c. Dismissal

The Immersion Promotion Committee will make one of the following decisions or recommendations for each student in the fall of the anticipated final academic year of training:

1. Promotion to senior status (eligible for match process)
2. Promotion on probation (eligible for match process)
3. No promotion
 - a. Targeted remediation
 - b. Dismissal

The Immersion Promotion Committee will make one of the following decisions or recommendations for each student in the spring of the anticipated final academic year of training:

1. Recommended for graduation
2. Not eligible for graduation
 - a. Targeted remediation on probation
 - b. Dismissal

Because the portfolio review includes assessment of competencies across courses, it is possible for a student to pass all courses and still have concerns within competency domains that warrant probation or dismissal.

Decisions on all actions other than dismissal (promotion, promotion on probation, no promotion with targeted remediation, or no promotion with repeat the phase on probation) are made by the Promotion Committee. The SADHSE will review those decisions upon the written request of the student as set out in the section on probation below.

Students will be notified by the committee chair and the ADUME of all Promotion Committee decisions. For the action of promotion, this shall generally be done in writing. For other actions of the Promotion Committee, in addition to written notification, the student will be informed in person by the ADMSA (if possible) in order to facilitate appropriate advising.

VI. Adverse Actions

Probation

Promotion Committees will ordinarily recommend that a student be placed on academic probation if course grades include any failures, or if competency progress levels are at Threshold

for two or more domains or at Below Threshold in any single domain.

Academic probation is generally set to monitor performance in active course work for a period of one academic year. Probation serves three functions:

- It serves as official documentation that the student is deficient in areas related to academic performance and/or competency development.
- It provides a pathway that the student must follow in order to regain good standing. This may include remediation, maintaining appropriate performance standards, and/or adhering to professional expectations.
- It describes the consequences that will result if a student does not meet stated expectations during the period of probation.

Probation is considered an adverse action that will be noted on the student's transcript and the Medical Student Performance Evaluation (see page 55 of this catalog), and will be reported as necessary in future graduation verifications and other requests for information.

The PLPs for students who are placed on probation must include a remediation plan that explicitly addresses the domains of concern and is approved by the Promotion Committee. The committee may add requirements to the PLP, such as regular meetings with the associate dean for medical student affairs or other advisers, and/or recommendations such as elimination of extra-curricular activities that may be interfering with satisfactory academic progress. All students who are placed on probation will receive a letter from the ADUME and the chair of the Promotion Committee that outlines reasons for the probation, requirements and recommendations for addressing deficiencies, conditions for removal of probation, including an expected time frame, and actions that may be taken if conditions are not met.

Any student on probation will be presented at the next Promotion Committee meeting to determine whether there has been satisfactory progress. At that time the committee may take the following actions:

1. Remove probation: Domains of concern now at Target. Probation can be removed at any PC regular meeting if students have satisfactorily addressed deficiencies, even if this is before the time frame originally designated by the PC.
2. Continue probation: Domain scores not yet at Target but progress is being made.
3. Recommend dismissal: If a student who is on probation receives a failing or P* grade in a course, or demonstrates persistent Threshold or Below Threshold performance in any competency domain, the Promotion Committee will consider dismissal. Ordinarily, a student will be dismissed from school unless there are mitigating circumstances approved by the dean.

Temporary Suspension

The School of Medicine reserves the right, through the SADHSE (or designee), to temporarily suspend a student for conduct disrupting the operations of the Medical Center, including the School of Medicine, pending referral to the Promotion Committee or other appropriate process. The SADHSE will notify the student in writing of the conditions of the temporary suspension. If the student is reinstated, the student will work with the ADMSA to address any course work missed during the suspension.

Dismissal

Promotion Committees ordinarily will recommend dismissal only after a student has been given a reasonable probationary period to address deficiencies. Most often, this reasonable period will consist of a full academic phase or academic year. A decision to recommend dismissal requires participation of all Promotion Committee members.

Dismissal may also be recommended at any time for a student who demonstrates either a singular egregious behavior or is involved in one or more serious incidents inconsistent with the expectations for medical students at VUSM or in violation of university policy. The committee will meet as soon as possible to consider the situation, including its severity, and render a recommendation. The ADMSA will meet with the student prior to the committee meeting to hear the student's explanation, including any mitigating circumstances that could affect the committee's recommendations. The ADMSA will present the student's explanation, as well as any mitigating circumstances, to the Promotion Committee. Alternately, the student may elect to appear before the committee in person, submit an explanation in writing, or ask another faculty member to appear on behalf of him or her.

Any recommendation for dismissal will be presented by the ADUME to the SADHSE and the dean. The dean may reverse the recommendation, in which case the dean will respond in writing to the PC. In this circumstance the PC will consider whether probation or other action is appropriate under the guidelines above. If the dean accepts the recommendation of dismissal, the decision will be communicated to the student by the committee chair and the ADUME in writing, and the ADMSA will inform the student of the decision in person if possible.

Student Recourse Regarding Promotion Committee Actions

Probation/Non-promotion

Students may ask for reconsideration of any decision for probation or non-promotion. The request must be made in writing to the ADMSA within seven calendar days of receiving the committee decision. Reviews are carried out by the SADHSE. The student may meet with the SADHSE or present any additional information in writing. The SADHSE will review the information presented by the student, the ADUME, the chair of the PC, and the deliberations of the PC. The SADHSE will: (1) uphold the PC decision, (2) request a meeting for reconsideration of additional information, or (3) reverse the decision. If a decision for probation or non-promotion is reversed by the SADHSE, the SADHSE will respond to the Promotion Committee in writing with his/her decision. Even if the SADHSE reverses a decision of the committee, the SADHSE can require that the student follow any committee requirements and/or recommendations for addressing deficiencies.

Dismissal

A student has the following options upon a decision of dismissal:

1. Voluntary withdrawal from VUSM. The decision to withdraw must be presented in writing by the student to the ADMSA within seven (7) calendar days after the student is informed of the decision for dismissal.
2. Dismissal. If the student does not request to withdraw within this designated time frame, the dismissal will take effect on the eighth calendar day.
3. Appeal. The student must make a formal request for appeal in writing (which may include electronic mail)

to the ADMSA within seven (7) calendar days after the student is informed of the decision for dismissal. A student who requests an appeal forfeits the option to withdraw. The ADMSA will serve as the student's advocate in the appeals process and will inform the ADUME and the SADHSE of the student's request for appeal.

If a dismissal decision is appealed, the student will be placed on administrative leave and may not participate in patient care duties until the appeal is resolved. A review panel consisting of at least five (5) members of the executive faculty will be assembled by the dean or the dean's designee for a hearing within 30 days. In preparation for the hearing, the ADUME will make available any relevant information/documentation for the panel's review, which will include the all assessment components of the student's portfolio. The ADMSA will assist the student with the process and with gathering any additional information or documentation. The student may choose to be present at the appeal hearing and/or make a presentation in writing, which may contain documentation from other students, faculty members, and/or other sources. The student cannot have other representatives at this meeting. The chair of the Promotion Committee and the ADUME will attend this meeting to represent the findings of the PC. The ADMSA will also attend the meeting to answer questions from the review panel. The review is conducted without the presence of attorneys for either party. However, either party may consult with its own counsel prior to such review or during a break in the proceedings. If the review panel upholds the decision, the student will be dismissed without opportunity to withdraw. If the review panel reverses the decision, the review panel will provide the Promotion Committee with its written findings and will defer to the PC for consideration of probation and for determination of the requirements and conditions to accompany probation. The decision of the review panel will be final.

Withdrawal from School

Students who wish to withdraw from the School of Medicine for any reason must do so in writing to the associate dean for medical student affairs. In some cases, the student may be able to receive a refund of tuition, but it is important that the student discuss this decision with VUSM Office of Student Financial Services staff before moving forward with the process. A student who has been dismissed from school, but decides to appeal the decision, is no longer able to choose to withdraw. If a student withdraws, reentry is possible only with reapplication.

Special Assessment Activities in the Anticipated Year of Graduation: Medical Student Performance Evaluation

The Medical Student Performance Evaluation (MSPE) is created as a part of a student's permanent record and is submitted through the ERAS system by October 1 for fourth-year medical students. Included in the MSPE are summative comments from performance evaluations throughout medical training.

Generally, the associate dean for medical student affairs works with students on the creation of the MSPE. However, students may instead choose to work with the senior associate dean for health sciences education, the associate dean for undergraduate medical education, or the associate dean for diversity to create the MSPE. Students are neither asked nor expected to provide any reason or justification for their choice of MSPE writer.

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 a summer or fall semester may participate in Commencement the following May, and ordinarily the degree will be conferred at that time. Any student unable to participate in a Commencement ceremony will receive his or her diploma by mail.

Degree Requirements—Other School of Medicine Degrees

Hearing and Speech Sciences

All candidates for the doctor of audiology (Au.D.), master of science in speech-language pathology (M.S.–S.L.P.), and master of education of the deaf (M.D.E.) degrees must have satisfactorily completed all residency, academic course, and clinical practica requirements of their respective programs.

Doctor of Audiology

Degree Requirements

- The candidate for the Au.D. degree will spend at least nine academic semesters of graduate study at Vanderbilt and is expected to be enrolled in the School of Medicine during each fall, spring, or summer semester until completion of the degree.
- For Au.D. students, a minimum of 70 semester hours of formal, didactic course work which includes 15 clinical practicum semester hours is required for the Au.D. degree.
- All Au.D. students are expected to participate and make good progress in developing clinical skills through clinical practicum throughout their program. The first semester of clinical practicum will involve more observation and guidance than actual hands-on experience. A grade of Pass (*P*) or Fail (*F*) will be awarded for the first semester of practicum, primarily based on attendance, punctuality, professionalism, and active engagement in the learning process. In subsequent semesters, clinical supervisors award traditional letter grades (*A, B, C, F*) for clinical performance/learning, a grade which may be reduced for unexcused absences from either clinic or clinical case conference according to prevailing departmental guidelines. Student performance is reviewed annually, and a failure to appropriately develop clinical skills can result in probationary status which must be alleviated in order to continue in the program.
- Au.D. students must complete a fourth-year clinical externship which begins at the conclusion of the third year and must continue for a minimum of ten months.
- All Au.D. students must complete a capstone project. The doctoral capstone project comprises 6 credit hours taken in years 2 and 3.

Master of Science—Speech Language Pathology

Degree Requirements

- The candidate for the M.S.–S.L.P. will spend at least five academic semesters of graduate study at Vanderbilt.

Candidates for the M.S.–S.L.P. are expected to be enrolled in the School of Medicine during each fall, spring, or summer semester until completion of their degree requirements.

- For M.S.–S.L.P. students with an undergraduate background in communication sciences and disorders: A minimum of 48 semester hours of formal, didactic course work and 10 to 11 clinical practicum credit hours is required for the master's degree. For M.S.–S.L.P. students without an undergraduate background in communication sciences and disorders: A minimum of 54 semester credit hours of academic course work and 11 clinical practicum credit hours is required. Curriculum requirements, course content, and the number and distribution of credit hours within the 58-65 total are determined by the M.S.–S.L.P. program faculty.
- Enrollment in clinical practicum is required during each semester of the student's enrollment. Students must have 25 clock hours of clinical observation of clinical service provision conducted by or supervised by a person with the Certificate of Clinical Competence (CCC) in speech-language pathology from the American Speech-Language-Hearing Association. If this observation has not been met prior to enrollment in the M.S.–S.L.P. program, the student will complete the observation during the first semester before having an opportunity for direct patient contact. During the final semester of enrollment, the student will complete a 10-week full-time externship. Students are expected to have completed a minimum of 400 clinical clock hours prior to initiation of the externship.

Master of Education of the Deaf

Degree Requirements

- The candidate for the M.D.E. degree will spend at least three academic semesters of graduate study at Vanderbilt. Candidates for the M.D.E. degree are expected to be enrolled in the School of Medicine during each fall, spring, or summer semester until completion of the degree.
- For M.D.E. students on the one-year track, a minimum of 30 semester hours of formal, didactic course work and 8 practicum semester hours is required. Students on the two-year track must complete a minimum of 50 semester hours of formal, didactic course work and 14 practicum semester hours.
- Maymester internship/externship, designed to provide students with a unique opportunity for a three-week intensive practicum working with deaf and hard-of-hearing children in an auditory-oral setting, is required for graduation.
- Students must also complete a service obligation experience which provides them with the opportunity to gain an enhanced understanding of the challenges facing children with hearing loss and their families. Service obligations require a minimum of 100 hours during the first year of enrollment. At least half of the hours should involve direct child contact.

Master of Laboratory Investigation

Degree Requirements

- Candidates for the M.L.I. degree are required to complete thirty-six semester credit hours. However, no more than twelve hours may be taken in an academic year, unless approved by the program director. Entering students are

required to complete Responsible Conduct of Research. Students may earn a maximum of 6 semester credit hours for Interdisciplinary Graduate Program (IGP) bioregulation modules. To complete thirty-six hours of credit, students will choose one of three program tracks.

- 1) Research with Thesis Track: Students who choose this track will develop a research project under the direction of a mentor and must register for twelve semester hours of research. Note: Only research conducted outside of one's job requirements can be considered for research credit. *In lieu* of a formal thesis, a graduate student can prepare a manuscript that is suitable for publication. Although it is highly desirable that the manuscript be published, there is no requirement that the manuscript be published in order for a student to graduate.
- 2) Modified Research Track: Students who pursue this track are not required to write a thesis, but are expected to present their research to a formal audience, which may include a conference gathering or poster presentation at Vanderbilt University. This track requires six semester hours of research and at least six hours of technique training modules. Note: Only research conducted outside of one's job requirements can be considered for research credit.
- 3) Techniques Track: Individuals who have a strong academic/research background may select a track that emphasizes strengthening their laboratory techniques. This track requires twelve semester hours of advanced technique modules.
- Students are required to assemble a committee of faculty members who will direct their research and the selection of course work and technique modules throughout the degree program. A committee includes a minimum of three faculty members, one of whom will be the student's mentor. Committee approval of satisfactory progress is required each semester.

Master of Public Health

Degree Requirements

- Candidates for the M.P.H must complete 42 academic credit hours of course work. Students in all three tracks take core courses that include content in epidemiology, biostatistics, social and behavioral science, environmental health, health services administration, protocol/project development, grant writing and research ethics. Students in the Epidemiology track also take advanced courses in epidemiology and biostatistics. Students in the Global Health track also take foundational courses in global health including leadership and management. Students in the Health Policy track also take health economics, decision analysis in medicine and public health, and program and policy evaluation.
- Students receive track-specific advising for their practicum and thesis. Satisfactory completion of both is required for all students.
- Up to 15 hours of prior course work from other schools at Vanderbilt or other universities may be applied to the required 42 credit hours needed for the degree, conditional upon the approval of the Admissions Committee. The practicum may be waived for individuals who already have extensive public health experience, conditional upon the approval of the Admissions Committee. Other hours must be completed from program offerings or approved by track directors.

Master of Science in Applied Clinical Informatics

Degree Requirements

The MSACI's goal is to develop clinical informaticians who will be capable of developing and leading innovative applications of information technology and information systems that address clinical, research, and public health priorities. The program will provide a 36-credit hour curriculum in 21 months, with a course work intensive first year followed by a second year devoted to a capstone project. The curriculum emphasizes a deep theoretical and practical understanding of the care process, informatics concepts, information technologies, computer science, and the changing social, organizational, and economic context in which health care is delivered. This understanding will be developed through course work, over 240 hours of practicum experience that uses real HIT data and systems and health care contexts, and a mentored capstone project. The degree program will provide physicians with didactic and experiential training in alignment with ACGME guidelines for CI fellowships.

Didactics

Expert faculty who comprise the largest biomedical informatics department in the U.S. will lead nine MSACI courses, which include the core content of the ABMS subspecialty certification:

- Introduction to Clinical Informatics
- Health Information Systems and Applications
- The Health System
- Clinical Information Systems
- Clinical Decision Support
- Clinical Workflow
- Data Standards
- Information System Lifecycle
- Management and Organizational Change

Practicum Experience

A practicum experience will have the following characteristics: Require a minimum of 240 hours effort to be completed during year 2 and can be satisfied in highly flexible ways, e.g., at VUMC, at home institution or other site (with MSACI program approval). The trainee must be embedded (i.e., assigned to participate as a member) in an interdisciplinary team that is addressing a significant clinical informatics challenge. This includes attending regular team meetings and participating in analysis of issues, planning, and implementation of recommendations from the team. The interdisciplinary teams must include physicians, nurses, other health care professionals, administrators, and information technology/system personnel, as appropriate.

Capstone Project

A required capstone project running throughout the fellowship will provide students with knowledge and skills required to design and conduct applied research studies to evaluate the efficacy of informatics applications in the clinical environment. Based on personal career objectives and informatics challenges that they identify in practice, the capstone project will have the flexibility to be completed as a cohort, a sub-cohort group, or individually, depending on its design and the needs of our learners. The project will begin in the first year and continue in the second year. Each student will have a project mentor from among the DBMI faculty, as well as a practice mentor within his/her home department/organization.

Master of Science in Clinical Investigation

Degree Requirements

- Candidates for the M.S.C.I. must complete 35 semester credit hours of the core course work.
- Completion of a final project in the form of a submission-ready, extramural grant or an original article for publication in a peer-reviewed journal is also required. Final projects are reviewed and approved by the Promotion Committee.
- Students who are unable to complete a grant or manuscript may submit a thesis. The thesis should include a brief introduction explaining why a grant or manuscript could not be submitted. No oral presentation is required. The thesis should include a brief statement of the student's role in the work to be described in the research report and a 10- to 15-page report outlining the hypothesis tested, background and significance of the work, the experimental approach and methods, data analysis/sample size calculations, anticipated results and pitfalls, results to date, interpretation of results, discussion of results, and future plans.

Professional Programs in Medical Physics

Professional Doctorate in Medical Physics

Degree Requirements

- Candidates for the D.M.P. must complete a total of 92 semester credit hours. Of this total, 50 semester credit hours will be in didactic classroom and laboratory instruction, with an emphasis on either imaging or radiotherapy physics.
- Candidates will complete an independent study project for six semester credit hours.
- Students are required to complete 30 semester credit hours of professional clinical rotations. Clinical training will total a minimum of 24 months. Limited introductory clinical training called practicum (approximately three full-time equivalent months) will occur in year 2; students will receive 6 professional credit hours for the successful completion of the practicum.

Master of Science in Medical Physics

Degree Requirements

- Candidates for the M.S.M.P. must complete a total of 38 semester credit hours. Of this total, 32 semester credit hours will be in didactic classroom and laboratory instruction with an emphasis on either imaging or radiotherapy physics.
- Students are required to complete 6 semester credit hours of professional clinical rotations or practicum. The practicum is specific to the areas of clinical diagnostic and nuclear medicine imaging or radiotherapy treatment planning and associated techniques.
- Students may choose a thesis or non-thesis option in either discipline. Students in the non-thesis option may choose to participate in a 1–2 semester credit hour independent study.

Academic Policies—Other School of Medicine Degrees

Registration

Academic Load and Credit Hours. The normal academic load for full-time status is 8 to 12 hours in the fall and spring semesters. A student who wishes to carry more than 16 hours must secure authorization from the senior associate dean for health sciences education before registration. Half-time status is 4 to 7 hours. The summer full-time load is 6 or more hours with half-time load at 3 to 5 hours. All full-time students must register each fall and spring semester with no breaks in registration to remain in good standing. Students in the Department of Hearing and Speech are required to have continuous enrollment through fall, spring, and summer semesters. For courses given in sequence or with prerequisite courses, a student may not enroll in the second or subsequent course without completing the first course in the sequence with a grade of B or higher.

Credit hours are semester hours; e.g., a three-hour course carries credit of 3 semester hours. One semester credit hour represents at least three hours of academic work per week, on average, for one semester. Academic work includes, but is not necessarily limited to, lectures, laboratory work, homework, research, class readings, independent study, internships, practica, studio work, recitals, practicing, rehearsing, and recitations. Some Vanderbilt courses may have requirements that exceed this definition.

Changes in registration. Changes to semester-long courses must be made within the change period (the first ten days of the term). A student may formally withdraw from a course after the end of the change period with the permission of the faculty member, 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 except under certain circumstances. Failing the course is not considered one of the circumstances. Students should also be aware of financial ramifications of dropping a course after the change period. Some programs may allow additional change periods within the term.

Auditing a course. Auditing of courses may be subject to program-specific policies. Some programs do not allow auditing due to the strong emphasis on student participation in course work. With the program and instructor's permission, students may be permitted to audit a course. Only students registered for regular courses will be allowed to audit a course. Students who audit are expected to attend class regularly. Audits will be recorded on the student's transcript. Students may be limited to the number of courses that may be audited in a given semester. A grade of AW will be entered onto a transcript when a student withdraws from a course that is being audited after the change period (the first ten days of the term).

Special students. Special students admitted as non-degree seeking students may register for selected courses. Students seeking special student status must submit an application to the program within which the course is offered. Approval of the instructor and the program administration is required. Special students must meet the same eligibility requirements as the program's degree seeking students. Registration for individual classes is contingent upon availability of space in the course.

Dual degree students. Students pursuing a dual degree will be required to designate a primary degree program during each registration period.

Grading and Promotion Policies

Grading. The grading scale will include the following:

| | |
|----|---|
| A+ | = 4.0 |
| A | = 4.0 |
| A- | = 3.7 |
| B+ | = 3.3 |
| B | = 3.0 |
| B- | = 2.7 |
| C+ | = 2.3 |
| C | = 2.0 |
| C- | = 1.7 (no earned hours/quality hours and quality points only) |
| F | = No credit |

Pass/Fail Grading: Some courses may be designated as pass/fail. The grades for these courses will not be calculated in the GPA unless the final grade is *F*. Degree-seeking students may not elect to take a course pass/fail. Non-degree seeking students may be allowed by a program to elect to take a course pass/fail.

Incomplete: The grade *I* (Incomplete) 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. An *I* that is not replaced by a letter grade within one year may be changed to an *F* at the discretion of the instructor. Otherwise, the *I* may become permanent and remain on the transcript as such.

A Grade of W: The grade of *W* is entered onto the transcript when a student withdraws from a course after the close of the change period (the first ten days of the term) or from the School of Medicine program.

Academic Probation and Good Standing: A cumulative grade point average of 3.0 is required for graduation. A semester average of 3.0 is required to remain in "good standing." A student whose cumulative grade point average falls below 3.0 may be placed on probation for one semester. If at the end of the semester the grade point average is still below 3.0, the student may be advised to withdraw or face dismissal. Degree programs may have additional requirements concerning requirements for the degree.

Repeating a Course: Students may be required to repeat a course for which a grade of *C* or below was received. Both courses will be reflected on the transcript, but the second grade earned will be the one used in computing the student's grade point average. In some programs only a grade of *B* or better will count toward degree requirements.

Grade Change Policy: A grade recorded in the University Registrar's Office (on a transcript) may be changed only upon the written request of the instructor with the approval of the appropriate program official. Changes may be submitted to the School of Medicine Office of Enrollment Services. This policy also includes changing an *I* to a final grade.

Grievance Procedure: Students who believe their academic performance has not been judged reasonably or fairly, or who believe their intellectual contributions have not been fairly acknowledged, should consult the director of their degree program with any concerns. Each program will determine the process through which a grievance will be addressed. It is recommended that students address these issues as soon as possible, but preferably within six months of the completion of the course work.

Transfer Credit: Only those courses for which a student has received a grade of *B* or its equivalent will be considered for transfer. In general, no more than 6 credit hours earned as a non-degree seeking student may be applied toward degree credit. In some programs, students may petition for approval of additional credits to be applied to their degree program. Credit will not be given for courses taken in the Division of Unclassified Studies.

Credit for Courses Taken as an Undergraduate: Students may not request credit for work taken prior to beginning the degree program if the credit was used to satisfy requirements of the previous degree. Students wishing to receive credit from previous work must request approval through the director of the program.

Satisfactory Academic Progress: The normal time frame for completion of required course work for the doctor of audiology and doctor of medical physics degrees is four academic years. The maximum time for completion of these degrees is no more than five years. The normal time frame for completion of required course work for the master of science in medical physics, master of science (speech-language pathology), and master of clinical investigation is two years. The maximum time for completion of these degrees is no more than three years. The normal time frame for completion of required course work for the master of laboratory investigation is three years. The maximum time for completion of the degree requirements is five years. The normal time frame for completion of required course work for the master of education of the deaf is one to two years, depending on student's academic background on entering the program. The maximum time frame for completion of this degree is three years. The normal time frame for completion of required course work for the master of science in applied clinical informatics is 21 months. The maximum time frame for completion of this degree is three years. The normal time frame for completion of required course work for the master of public health is two years. The maximum time frame for completion of this degree is four years.

Student Actions

Leave of Absence. Students who wish to interrupt their study must request and receive a leave of absence from the program director. Additional approval may be required for some programs. A leave of absence is granted for a maximum of one year. Students who do not register after the leave may be dropped from the rolls and may be required to request reinstatement to the program. All programs have limits to the time within which all requirements must be completed, and it is the student's responsibility to be aware of these limits.

Withdrawal from the University. Students who intend to withdraw from the university should inform the program director in writing. Improper notification may result in academic or financial penalties.

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. In the same way when degree requirements have been completed, it is necessary for the degree to be conferred. 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. All students are required to be free of indebtedness to the university at the time of graduation.

Graduate Certificate Programs

The School of Medicine offers graduate certificate programs to its students who wish to gain focused expertise in a specific area. Each program has its own admission and completion requirements. Students must submit an “Intent to Enroll” form to document their intention to pursue a certificate, as well as other documentation as needed. Permission of the degree program director and the certificate program director are required to pursue a certificate. Additional details on each program are provided below and at medschool.vanderbilt.edu.

Biomedical Ethics

This certificate is designed to enable students to graduate with a high level of competence in analyzing and resolving ethical issues that they will face in practice and equip them to provide leadership to their colleagues, to the profession, and to the public in biomedical ethics.

Curriculum. This certificate is offered to students in the School of Medicine. Its curriculum consists of three elements:

1. An interdisciplinary graduate seminar, Healthcare Ethics—Theory and Practice (IDIS 7222).
2. A tailored Research Immersion to focus on the student’s special research interests within ethics, including options such as selecting a topic within a clinical specialty (for example, pediatrics, internal medicine, surgery, or psychiatry). Projects may combine empirical and conceptual work with mentorship provided by designated mentors within the ethics, education, policy, and society area of the M.D. Program Immersion Phase Inquiry Program. The graduate seminar described above is part of the M.D. degree Immersion Phase Inquiry Program.
3. An apprenticeship with the Clinical Ethics Consult Service, which is offered as an M.D. degree Immersion course. The Ethics Consult Service of the Center for Biomedical Ethics and Society provides formal consultation to VUMC hospitals and conducts a wide range of educational programs in ethics for faculty, staff, fellows, residents, students, and others.

The graduate seminar, the Immersion phase research project, and the Immersion phase consult apprenticeship may be taken separately, but completion of the Certificate in Biomedical Ethics requires successful completion of all three components.

Global Health

The certificate promotes training opportunities in global health. Students in any Vanderbilt graduate or professional degree program who fulfill all requirements are granted a Global Health Certificate upon receipt of their graduate degrees.

Certificate Requirements. (12 credit hours total)

1. Core Course (choose at least one—each course is 3 credit hours)
 - Foundations of Global Health
 - Essential Skills in Global Health
2. Elective Courses—at least 9 credit hours in additional global health course work
 - These courses may be a combination of VIGH global health courses or other approved courses that have relevance to global health, including a Global Health ISC, AE, or research immersion.

- Students may individually tailor and/or design electives in consultation with faculty mentors. Practicum, thesis, research immersion, and individual learning courses that have relevance to global health may be approved for certificate credit.

- A year-abroad global health experience such as a Fogarty, Fulbright-Fogarty, Medical Scholars, or Doris Duke international fellowship also counts toward elective credit hours. Typically, global health field experiences are abroad, though certain circumstances and interests may allow students to engage in global health work in Middle Tennessee.

- All courses for this certificate must be taken for graduate credit and involve global health content.

3. To initiate this certificate, submit the VIGH Graduate Certificate in Global Health “Intent to Enroll” form, found at <https://redcap.vanderbilt.edu/surveys/?s=KCHTLWPX8W>. Note: Your academic adviser or program director will need to sign this form.
4. To complete and receive this certificate, submit the VIGH Certificate in Global Health application, found at <https://redcap.vanderbilt.edu/surveys/?s=WDMHY9YKX9>. This application should be submitted at least two months prior to graduation.

More information can be found on the VIGH website: http://globalhealth.vanderbilt.edu/education-and-training/academic-programs/gh_certificate/.

Lesbian, Gay, Bisexual, and Transgender (LGBT) Health

LGBTI patients experience disparities in access to and quality of care, leading to preventable, adverse health outcomes including elevated risk for specific chronic diseases and increased rates of suicide and depression. The Certificate in LGBTI Health is designed to teach students how to address these disparities, improve the health of LGBTI patients, support education around LGBTI health, and foster research on the optimal ways to care for LGBTI patients and families.

The Certificate in LGBT Health comprises three elements:

1. *Research Immersion in LGBT Health.* Students will select a research topic within the realm of LGBT health. This may include selecting a topic within a clinical specialty, for example, adolescent medicine, infectious disease, psychiatry, or surgery. Projects may combine empirical and conceptual work with mentorship provided by designated mentors.
2. *LGBTI Health in Inter-professional Practice or Sex, Sexuality, and Sexual Health Elective.* Students choose from one of these two interdisciplinary courses focusing on sexual health in the general population and the specific health care needs of sexual and gender minorities. In addition to the basic sciences underlying the pathophysiology of health in these populations (e.g., HPV infection, HPA dysregulation with chronic stress), clinical specialties highlighted in the course include pediatrics and adolescent medicine, OB/GYN, psychiatry, and internal medicine with content threads from ethics, medico-legal health care, human development, and chronic care.
3. *Capstone Project.* Each student will complete a capstone project related to LGBT health. This may include development of patient education materials, providing a community or staff training, or implementation of a quality

improvement project. The capstone is expected to enable students to demonstrate proficiency and acquired knowledge in the area of LGBT health.

Each element may be taken separately, but completion of the Certificate in LGBT Health requires successful completion of all three elements.

Neurodevelopmental Disabilities (NDD)

The Neurodevelopmental Disabilities (NDD) Certificate Program provides an opportunity for Vanderbilt medical students to receive substantial education and training in the field of autism spectrum disorder/neurodevelopmental disabilities ASD/NDD. As participants in the Vanderbilt Consortium LEND* (VCL), accepted students will address the critical shortage of health professionals who are trained to provide culturally sensitive, patient- and family-centered, interprofessional care to children and youth with special health care needs, especially those with ASD/NDD.

The program provides an intensive (more than 300 hours), two-semester interprofessional training experience which includes:

- Rigorous weekly Core Curriculum in ASD/NDD, a monthly leadership seminar series, and a Care Navigation Practicum in which trainees assist patients and families in care navigation while learning about social determinants of health and community-based services.
- Clinical experiences in various interprofessional hospital-based, community-based, and public health clinics.
- Individual and group projects.
- A broad list of activities from which the trainees can tailor their experiences based on their professional goals and aspirations.

At the completion of this experience, the students will have the requisite knowledge, skills, and attitudes to assume leadership roles in the field of NDD and to provide interprofessional, patient- and family-centered, community-coordinated, culturally competent, and empirically-based services to individuals with ASD/NDD and their families.

Trainees receive \$7,500 to participate in the program, and these funds will be applied to tuition. Successful completion of the NDD Certificate Program also fulfills components of the Foundations of Health Care Delivery and Learning Community graduation requirements.

*National LEND program website: <https://www.aucd.org/template/page.cfm?id=473>

Vanderbilt LEND program website: <http://vkc.mc.vanderbilt.edu/vkc/lend/>

Allied Health Programs

The Allied Health Programs of Vanderbilt University are dedicated to preparing students for excellence in their chosen career and instilling compassion and a commitment to the highest quality of patient care through transformative learning programs and access to the delivery of exemplary health care.

Cardiovascular Perfusion Technology

Michael Petracek, M.D., Medical Director
Clayton Kaiser, M.D., Assistant Medical Director
Nicole Michaud, M.S., C.C.P., L.P., P.B.M.T., Program Director
Isaac Chinnappan, M.S., C.C.P., L.C.P., Associate Program Director

Program Length: 3680 hours/92 weeks

Graduation Document: Certificate

Delivery Method: Residential

The general academic requirements for all perfusion education programs are established by the Accreditation Committee for Perfusion Education (AC-PE), which organization is responsible for the initial and continuing evaluation of all perfusion education programs. The AC-PE is accredited to so operate pursuant authority granted by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

Program Objectives and Goals

The Perfusion program bases its educational process and strategy on those principles that are essential in preparing students to achieve the ideals of the profession. The program strives to instill in each student:

- the knowledge, skills and professional attitude necessary to safely and effectively perform clinical perfusion care;
- a concern for others, which carries with it the responsibility of good patient care combined with professional cooperation with fellow students and staff and faculty;
- the desire to strive for new knowledge and to accept and adopt changing trends in the profession;
- the capacity to accept leadership roles, whether in management or education;
- an interest in the growth and development of the perfusion profession.

Curriculum and Calendar

Students in the Perfusion program at Vanderbilt University Medical Center experience 22 consecutive months of clinical and didactic training leading to a certificate in perfusion from Vanderbilt University. The program starts at the beginning of August each year and ends in mid-May.

Complete information about the program curriculum may be found on its website at <https://medschool.vanderbilt.edu/allied-health/perfusion>.

Diagnostic Medical Sonography

Arthur C. Fleischer, MD, Medical Director
Jill D. Trotter, BS, RT(R), RDMS, RVT, Program Director

Program Length: 2311 hours / 78 weeks
Graduation Document: Certificate
Delivery Method: Residential

Goals & Objectives

The sonography profession requires the ability to provide diagnostic sonographic imaging using critical thinking skills to make judgments in the process. Sonographers are professionals who must possess high level skills in diagnostic sonographic techniques under the guidance of a licensed physician. A sonographer is responsible for providing excellent patient care and gathering adequate data necessary for diagnoses to be determined.

The goal of the VU Diagnostic Medical Sonography program is to prepare competent, entry-level general sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.

Upon graduation, students will have demonstrated and completed all clinical and academic competencies required for eligibility to take the American Registry of Diagnostic Medical Sonography (ARDMS) certification exams in the area(s) of study.

Complete information about the program curriculum may be found on its website, at <https://medschool.vanderbilt.edu/allied-health/dms>.

Dietetic Internship Program

Elizabeth W. Robinson, M.Ed., R.D., L.D.N., Program Director
Dianne Killebrew, M.Ed. R.D., L.D.N., Educational Coordinator

Program Length: 1760 hours / 44 weeks
Graduation Document: Certificate
Delivery Method: Residential

Program Description

The Vanderbilt University Medical Center Dietetic Internship provides a pre-eminent supervised practice program that is an excellent model for the preparation of knowledgeable, talented and compassionate entry level dietitians delivering high quality nutrition therapy in the hospital and innovative nutrition programming within community based systems and networks.

This 10-month (44-week) program typically runs from August to June of each year.

Complete information about the program curriculum may be found on its website, at <https://medschool.vanderbilt.edu/allied-health/di>.

Neurodiagnostic Technology

Riki Rager, R. EEG T., B.S., FASET, Program Director

Program Length: 2201 hours / 71 weeks
Graduation Document: Certificate
Delivery Method: Residential

The foundation of the Neurodiagnostic Technology curriculum is based on the courses developed by ASET, the national society representing the neurodiagnostic technology profession.

Complete information about the program curriculum may be found on its website, at <https://medschool.vanderbilt.edu/allied-health/ndt>.

Honors and Awards

Alpha Omega Alpha

A chapter of this medical honor society was established by charter in the School of Medicine in 1923. Not more than one-fourth of the students of the fourth-year class are eligible for membership, and no more than 17 percent (one-sixth of the graduating class) can be nominated per class.

The society has for its purpose the development of high standards of personal conduct and scholarship and the encouragement of medical research. Students are elected into membership on the basis of scholarship, character, and originality.

Gold Humanism Honor Society

A chapter of this honor society was founded in 2015 in an effort to recognize, support and promote the values of humanism and professionalism in medicine. The number of members eligible to be nominated and selected will be up to 15 percent of the medical school class. Students are elected into membership by showing that they are exemplars of integrity, excellence, compassion, altruism, respect, empathy, and service.

Founder's Medal

The Founder's Medal, signifying first honors, was endowed by Commodore Cornelius Vanderbilt as one of his gifts to the University. This medal is awarded to the student in the graduating class of the School of Medicine who, in the judgment of the course directors, has achieved the strongest record in the several areas of personal, professional, and academic performance in meeting the requirements for the doctor of medicine degree during four years of study at Vanderbilt.

Class Day Awards

AMERICAN ACADEMY OF NEUROLOGY MEDICAL STUDENT PRIZE FOR EXCELLENCE IN NEUROLOGY. This award is to recognize medical students for excellence in clinical neurology.

BEAUCHAMP SCHOLARSHIP. Endowed and awarded to the student showing the greatest progress in the field of psychiatry.

LONNIE S. BURNETT AWARD IN OBSTETRICS AND GYNECOLOGY. This award is given to the student demonstrating superior performance and who exemplifies the qualities of dedication, leadership, compassion, and integrity in the field of Obstetrics and Gynecology.

DIXON N. BURNS AWARD IN MEDICAL ETHICS. This is an award given by the Center for Clinical and Research Ethics to the graduating medical student who has, through a written essay, demonstrated unusual ability in identifying and analyzing ethical issues presented in either clinical or research contexts.

THE GEORGE AND BARBARA BURRUS MEDICAL MISSIONS AWARD. This award is presented to a student who has demonstrated exceptional interest and participation in providing medical care to the poor during medical school either locally or abroad.

THE GEOFFREY DAVID CHAZEN AWARD. This award for innovation in medical education was established to recognize a student, resident, fellow, or faculty member who has made special contributions to the educational programs of the Vanderbilt University School of Medicine through the development and implementation of effective innovation in educational approach.

AMOS CHRISTIE AWARD. This award recognizes the student in the graduating class who has demonstrated the outstanding qualities of scholarship and humanity embodied in the ideal pediatrician.

JOHN G. CONIGLIO PRIZE IN BIOCHEMISTRY. This award presented to a medical student who has distinguished him/herself in Biochemistry. Both accomplishments in biomedical research and performance in Biochemistry courses are considered in evaluating candidates for this award. This award was established by friends of Professor Coniglio on the occasion of his retirement to honor his many contributions to medical education at Vanderbilt.

OSCAR B. CROFFORD AWARD FOR DIABETES/ ENDOCRINE RESEARCH. This award is presented by the Division of Diabetes, Endocrinology, and Metabolism and the Vanderbilt Diabetes Center to the graduating medical student who has performed outstanding research in the area of diabetes and endocrinology. This award was established to honor Dr. Oscar B. Crofford for his contributions to the diabetes research at Vanderbilt and throughout the world.

DEAN'S AWARD. Presented to medical students distinguished by outstanding service to the School of Medicine and the community.

THE DEAN'S AWARD FOR RESEARCH. This award is presented to the graduating medical student who best exemplifies the attributes that lead to success in basic science or clinical research, namely creativity, dedication, productivity/multiple publications and careful diligence.

EXCELLENCE IN EMERGENCY MEDICINE. The award for excellence in emergency medicine is given on behalf of the Society for Academic Emergency Medicine. This award recognizes a medical student who demonstrated outstanding ability and commitment to the specialty of emergency medicine at Vanderbilt University Medical Center.

EXCELLENCE IN INFECTIOUS DISEASES. This award is presented by the Divisions of Infectious Diseases in the Departments of Medicine and Pediatrics to the student who has demonstrated outstanding aptitude and performance in clinical and investigative efforts in infectious diseases or microbiology.

FAMILY AND COMMUNITY MEDICINE MERIT AWARD. This award is presented to a graduating medical student who has demonstrated leadership and a commitment to family and community health care.

GERALD FENICHEL AWARD IN NEUROLOGY. Dr. Gerald Fenichel, professor of neurology and pediatrics, founded the Department of Neurology at Vanderbilt University Medical Center and served as chairman from 1969 to 2001. As one of the founders of the Child Neurology Society, his contributions to the fields of neurology and child neurology are immeasurable. This award is presented to a graduating medical student entering neurology or child neurology who has demonstrated outstanding aptitude for clinical neurology and a devotion to patient care.

DAVID R. FREEDY MEMORIAL AWARD. This award was established to honor the memory of David Richard Freedy, a member of the Class of 1993. It is given to the student whose character, integrity, and courage provide inspiration to others and who has been dedicated to improving and promoting community life.

J. DONALD M. GASS AWARD IN OPHTHALMOLOGY. This award is established in honor of Dr. J. Donald M. Gass, a graduate of Vanderbilt University School of Medicine, Class of 1957 and a renowned medical retina specialist. This award is given to a student who demonstrates excellence in ophthalmic education and research.

GLASGOW-RUBIN CERTIFICATE OF COMMENDATION. This certificate is presented in recognition of women medical students who graduate as honor graduates. It serves to reaffirm the American Medical Women's Association's commitment to encouraging their continuing achievement.

JAMES T. GWATHMEY PRIZE IN ANESTHESIOLOGY. This award is presented to the graduating medical student who most clearly demonstrates the potential for excellence in academic anesthesiology. It is named after Dr. James Tayloe Gwathmey, a former Vanderbilt medical student who graduated in 1899 and went on to lead the creation of a new medical specialty called anesthesiology.

PAULA C. HOOS AWARD. The first-year class presents this award in recognition of teaching excellence in the anatomy laboratory and to express appreciation for the assistance of members of the graduating class.

HOSPITAL AWARD OF EXCELLENCE. This award recognizes the fourth year medical student by the chief residents of the services as having contributed most toward excellent patient care by demonstrating sensitivity, compassion, and concern in clinical responsibilities to patients of Vanderbilt Medical Center.

RICHARD B. JOHNSTON JR. AWARD. This award is presented to a graduating student entering pediatrics who has demonstrated excellence in academic scholarship and an extraordinary commitment to clinical medicine exemplifying the highest professional standards of the physician-scientist.

RUDOLPH KAMPMEIER PRIZE IN MEDICINE. The Kampmeier Award is presented by the Department of Medicine to the graduate who, in the judgment of the faculty, best combines high academic achievement with clinical excellence, original scholarship or research, and demonstrated potential for an academic career.

THE KAUFMAN PRIZE IN MEDICINE. This award honoring J. Kenneth Kaufman, M.D. '39, is presented to a graduating medical student who has demonstrated qualities of humaneness, dedication, and unselfish service in the study of medicine and will apply these qualities in medical practice.

LAURA KNOX HUMANITARIAN AWARD. This award recognizes a graduating student in the Department of Hearing and Speech Sciences who has demonstrated a history of outstanding humanitarian endeavor throughout the degree program.

RUSSELL J. LOVE HONORS IN SPEECH-LANGUAGE PATHOLOGY. Given by the faculty in the Department of Hearing and Speech Sciences for outstanding clinical and academic achievement in speech-language pathology.

THE TOM NESBITT AWARD. This award is presented by the Nashville Academy of Medicine to honor the outstanding service of Tom Nesbitt, M.D., a member of the academy and the 133rd president of the American Medical Association. This award is presented to the graduating medical student who demonstrates exemplary character and leadership and has an understanding of and appreciation for organized medicine.

DAVID N. ORTH AWARD IN ENDOCRINOLOGY. This award is presented by the Division of Diabetes, Endocrinology, and Metabolism and the Endocrine Society, the largest professional association devoted to all aspects of endocrinology, to a graduating medical student who has demonstrated outstanding performance in clinical or research endocrinology. The award honors Dr. David N. Orth for his contributions to and leadership in endocrinology. He served as director of Vanderbilt's Endocrinology Division and as president of the Endocrine Society.

THE ORTHOPAEDIC SURGERY CLERKSHIP AWARD. This award is presented by the Department of Orthopaedic Surgery to the student who has excelled in both the third and fourth year orthopaedic clerkships, and who has demonstrated outstanding potential in the field of orthopaedic surgery.

CANBY ROBINSON SOCIETY AWARD. With nominations generated from the fourth year class, this award is presented to a member of the graduating class who possesses those intangible qualities of common sense, knowledge, thoughtfulness, personal warmth, gentleness and confidence which combine to make the "Ideal Doctor"...the person fellow classmates would most like to have as their personal physician.

ROENTGEN AWARD. This award is given to a graduating medical student who has made important contributions in one of the radiological sciences during four years of study. Named for Wilhelm Conrad Roentgen, a pioneer in diagnostic radiology, the award recognizes discoveries in either clinical or research areas.

JAY W. SANDERS HONORS IN AUDIOLOGY AWARD. Given by the faculty in the Department of Hearing and Speech Sciences for outstanding clinical and academic achievement in audiology.

THE SCHOOL OF MEDICINE AWARD OF DISTINCTION. This award is presented to students who have demonstrated outstanding leadership abilities in service to the School of Medicine.

THE H. WILLIAM SCOTT JR. PRIZE IN SURGERY. This award is presented to the graduating medical student who exemplifies the qualities of leadership, performance, and character reflecting the ideal surgeon.

JOHN L. SHAPIRO AWARD FOR EXCELLENCE IN PATHOLOGY. This award, given upon action of the Department of Pathology, recognizes outstanding student performance in pathology. It is given annually or otherwise depending upon action by the department and honors the memory of Dr. John L. Shapiro, who was Professor and Chairman of the Department of Pathology from 1956 to 1971. Dr. Shapiro remained an active participant in a variety of university and community activities, until his death on July 15, 1983.

MILDRED T. STAHLMAN AWARD. This award honoring the pioneering spirit and achievements of Vanderbilt pediatrician Mildred Stahlman is presented to the graduating student entering pediatrics whose performance exemplifies the highest standards of leadership, professionalism, and commitment to improving the lives of children.

TENNESSEE ACADEMY OF FAMILY PHYSICIANS OUTSTANDING STUDENT IN FAMILY MEDICINE AWARD. This award is presented in recognition of dedication to the high ideals of family medicine.

THE LEONARD TOW HUMANISM IN MEDICINE AWARD. PRESENTED BY THE ARNOLD P. GOLD FOUNDATION. This award is given to a graduating student and a faculty member who demonstrate compassion and empathy in the delivery of health care, and who engender trust and confidence in both their patients and colleagues while adhering to professional ethical standards.

THE ALBERT WEINSTEIN PRIZE IN MEDICINE. The Weinstein Prize in Medicine is awarded to a student who has demonstrated high academic achievement, superior clinical competence, and the qualities of dedication and professionalism that characterize a good physician.

DAVID L. ZELEAR PH.D. OTOLARYNGOLOGY SCHOLAR-INITIATIVE AWARD. This award is presented to a medical student who excels beyond clinical competence and who has become distinguished for outstanding effort towards the academic mission of otolaryngology—research, teaching, and/or outreach.

Financial Information

Financial Information for Medical Students

Tuition for the academic year 2016/2017 is \$49,500. The annual expense of a first-year student in the School of Medicine is estimated to be \$82,343.

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

2016/2017

| | |
|--|-------|
| Application fee (to accompany secondary application) | \$ 50 |
| Student activities and recreation fee | 513 |
| Student health insurance | 3,064 |
| Professional liability insurance | 410 |
| Student long-term disability insurance | 52 |
| Student health service fee | 65 |
| Verification fee (third year) | 100 |
| Verification fee (fourth year) | 25 |
| Transcript fee (one time only) | 30 |

Payment of Tuition and Fees

All regularly enrolled medical students must pay the full tuition each year. There will be no exception to this requirement. Graduate students who enroll in courses in the medical curriculum for credit toward an academic degree and who later become candidates for the doctor of medicine degree may be required to pay the full tuition as indicated above. One half of tuition, fees, and other university charges are due and payable by 17 August. The second half of tuition, fees, and other university charges are due and payable by 31 January. Additional information can be found at vanderbilt.edu/stuaccts.

Refund of Tuition

Students who withdraw officially or who are dismissed from the university for any reason after the beginning of a term may be entitled to a partial refund in accordance with the schedule shown below. No refund will be made after the tenth week in any term.

| Withdrawal prior to the end of | Reduction |
|--------------------------------|-----------|
| 1st full week | 100% |
| 2nd full week | 90% |
| 3rd full week | 85% |
| 4th full week | 80% |
| 5th full week | 75% |
| 6th full week | 65% |
| 7th full week | 60% |
| 8th full week | 50% |
| 9th full week | 45% |
| 10th full week | 40% |

No refund after the 10th full week.

Late Payment of Fees

Charges not paid by 17 August will be automatically deferred, and the student's account will be assessed a monthly late payment fee at the following rate: \$1.50 on each \$100 that remains unpaid after 17 August (\$5 minimum). An additional monthly

late payment fee will be assessed unless payment is received in full on or before the end of each month, and late payment fees will continue for each month thereafter based on the outstanding balance unpaid as of the end of each month. All amounts deferred are due not later than 1 November for fall semester and 1 April for spring semester. Graduating students are not allowed to defer charges that are billed in advance for the final semester.

Financial Clearance

Students may not be allowed to register for any term if they have outstanding unpaid balances for any previous term. No transcript, official or unofficial, will be issued for a student who has an outstanding balance until the account has been paid. Diplomas of graduating students may be withheld until all bills are paid.

International students must provide documentation of having funds sufficient to meet all tuition, mandatory fees, and living expenses for the anticipated period of enrollment before a visa will be issued. Information will be provided by the university Office of International Student and Scholar Services.

Activities and Recreation Fees

The required student activities and recreation fees entitle 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. 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.

Professional Liability Insurance

Students will be automatically covered with professional liability insurance, required of all enrolled medical students, at the time of registration. The annual premium is payable in addition to tuition. Details of the policy are available at the university student insurance office, and students are encouraged to familiarize themselves with these details and with their responsibilities in this regard.

Students are covered whether they are at the Vanderbilt-affiliated hospitals (Vanderbilt University Medical Center, Nashville Veterans Administration Hospital, St. Thomas Hospital, or Baptist Hospital) or elsewhere as a "visiting student," providing that (1) the clerkship or other educational experience has prior approval from the School of Medicine as course work for credit, and (2) the activities within this experience are consonant with the student's level of training and experience and are performed under the supervision of appropriate faculty and/or staff.

Disability Insurance

Students will be automatically covered with long-term disability insurance, required of all enrolled medical students, at the time of registration. The annual premium is payable in addition to tuition. Details of the policy can be found at <https://medschool.vanderbilt.edu/financial-services/insurance>.

Student Health Insurance

All degree-seeking students registered for 4 or more hours at Vanderbilt are required to have adequate hospitalization 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 at www.gallagherstudent.com. Additional information is also available at vanderbilt.edu/stuaccts/g_health.html.

Student Health Service Fee

The required student health service fee covers required immunizations and health screening tests.

Verification Fee

The required verification fee covers all verification processes as required, including criminal background checks and drug screens.

Transcript Fee

All new students entering Vanderbilt for the first time are charged a one-time transcript fee for official university transcripts.

Financial Assistance

Education leading to the doctor of medicine degree requires a careful consideration of financial commitment by prospective students and their families. Financial planning is an important part of the student's preparation for medical school.

Scholarships awarded on the basis of merit and need are available through Vanderbilt. Financial aid from school sources must be considered a supplement to governmental and other sources, rather than the primary source of funds necessary to attend medical school. Institutional financial aid is not adequate to meet students' demonstrated need, but approved educational expenses are met with funds from a combination of sources. Government funds that furnish significant loans to medical students are the Federal Direct Unsubsidized Loan and the Federal Direct Graduate PLUS loans. Private and institutional loans are also available to international students.

Additional information and applications for financial aid are online at <https://medschool.vanderbilt.edu/financial-services/>. Applicants desiring more specific information about financial aid resources should contact the medical school Office of Student Financial Services.

The following are Vanderbilt University School of Medicine institutional scholarships and loans available to assist students.

Scholarships

THE JAMES T. AND OLIVIA R. ALLEN SCHOLARSHIP FUND was established in 1993 by Dr. James T. Allen, M.D.'42, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. Preference in awarding should be given to applicants who are members of the First Baptist Churches of Murfreesboro, Dickson, and Waverly, Tennessee, in that order. Should no such qualified students apply in any one year, then preference shall be given to applicants who are Tennessee residents followed by any qualified student enrolled at the School of Medicine.

THE ALPHA KAPPA KAPPA SCHOLARSHIP FUND was established in 1969 by the Alumni Board of Directors of the Alpha Kappa Kappa fraternity to provide financial support for individual medical student needs, primarily through provision of funds to help meet tuition cost.

THE LUCILE R. ANDERSON SCHOLARSHIP FUND was established in 1991 by Dr. Lucile Russell Anderson, M.D.'33, to provide scholarship support for deserving students at the School of Medicine.

THE SUE AND NELSON ANDREWS SCHOLARSHIP was established in 2001 by Nelson Andrews, B.A.'50, and Sue Adams Andrews, B.A.'51, to provide need-based scholarship support to students at the Vanderbilt University School of Medicine. A former member of the Vanderbilt University Board of Trust, Mr. Andrews passed away in 2009.

THE BAKER-LEONARD SCHOLARSHIP FUND was established in 2002 by Quentin B. Leonard to provide scholarship support for deserving graduate students in the Vanderbilt University School of Medicine. Mr. Leonard established this fund in memory of his grandparents, Bertha B. Baker and James S. Baker; his parents, Josephine F. Leonard and Sidney Leonard; and his uncle, Serring B. Baker. Mr. Leonard passed away in 2006.

THE SOJA PARK BENNETT M.D. SCHOLARSHIP was established in 2015 by Soja Park Bennett, M.D.'68, to provide financial support based on need or merit for deserving M.D. or M.D./Ph.D. students at the School of Medicine.

THE BRUCE B. DAN M.D. AND EUGENE AND MARGE BESPALOW SCHOLARSHIP FUND was established in 1985 by Bruce Dan, M.D.'74, to provide need-based scholarship support to deserving students at the School of Medicine. This fund was established in honor of Dr. Dan's grandparents. Upon their marriage in 1994, Lisa Stark and Dr. Dan started making contributions to the fund. Dr. Dan passed away on September 6, 2011. In 2015, Lisa Stark renamed this fund in memory of her husband and his grandparents.

THE THOMAS M. BLAKE FUND was established by Thomas M. Blake, M.D.'44, to provide financial support based on merit to worthy students at the School of Medicine.

THE DR. DANIEL B. BLAKEMORE FUND was established in 1987 through the bequest of Ms. Nell J. Blakemore to provide need-based scholarship support to deserving students in the Vanderbilt University School of Medicine. This fund was established in memory of Ms. Blakemore's husband, Dr. Daniel B. Blakemore. Preference should be given to male students from the state of Tennessee or from the United States.

THE POPPY PICKERING AND RICHARD D. BUCHANAN SCHOLARSHIP was established in 2011 by Poppy Pickering Buchanan, B.S.N.'61, and Richard D. Buchanan, B.A.'57, M.D.'61, to provide financial support based on need or merit for deserving students at the Vanderbilt University School of Medicine. Dr. and Mrs. Buchanan would like to provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE BURRUS MEDICAL SCHOOL SCHOLARSHIP FUND was established in 1978 by George R. Burrus, B.A.'52, M.D.'55, Roger B. Burrus, B.A.'50, M.D.'57, Dr. William C. Burrus, former Vanderbilt student, and Swan B. Burrus, B.A.'51, M.D.'54, to provide need-based scholarship support to deserving students enrolled at the School of Medicine. Donor's father, Dr. Roger Boswell Burrus Sr., graduated from the School of Medicine with the Class of 1926.

THE GREER BUSBEE III SCHOLARSHIP was established in 1999 by Dr. and Mrs. Brandon Busbee to provide financial support based on need to deserving students at the School of Medicine. Preference in awarding is given to Southern males who exhibit strong academic records. This fund was established in memory of Green Albert Busbee III, B.A.'66, M.D.'69.

THE CARLO-LEONARD SCHOLARSHIP was established in 2014 by Eugenia and Waldemar A. Carlo to provide financial support based on need or merit for deserving M.D. or M.D./Ph.D. students at the School of Medicine. This scholarship is named for the Carlo family and in honor of emeritus faculty member, John M. Leonard, M.D.'67. Mr. and Mrs. Carlo's daughter, Mariu Carlo, M.D. 2010, H.O. 2011, considers this scholarship an opportunity to honor Dr. Leonard, who made a huge impact on her formation as a doctor as well as that of thousands of other medical students and internal medicine residents.

THE THOMAS C. AND PAULINE C. BUTLER SCHOLARSHIP FUND was established in 1987 by Thomas Cullom Butler, B.A.'30, M.D.'34, to provide need-based scholarship support to deserving students in the Vanderbilt University School of Medicine.

THE CARELL FAMILY SCHOLARSHIP was established in 2012 by the children of James W. Carell to provide annual financial support for deserving students at the Vanderbilt University School of Medicine. Jim Carell's five children, Mrs. Christine C. Palmer, Mr. Michael Joseph Carell, Mr. Richard Potter Carell, Mr. James Monroe Carell, and Ms. Eileen Kenefick Carell Allen established this fund.

THE WILLIAM ROBERT CATE M.D. SCHOLARSHIP was established in his memory in 1996 by Dr. Robert D. Collins, Sr., and other family members, friends and colleagues to provide scholarship support to students at the Vanderbilt University School of Medicine. Dr. Cate passed away in 1973. Dr. Collins, a former son-in-law of Dr. Cate, passed away in 2013.

THE JOHN E. CHAPMAN M.D. ENDOWED SCHOLARSHIP FUND was established in 2001 by friends, colleagues and medical alumni to provide full- and partial-tuition scholarship support on the basis of merit and need to students in the Vanderbilt University School of Medicine. This fund was established to honor Dean Chapman, the seventh dean of the School of Medicine, upon his retirement after twenty-five years of service.

THE JOHN E. AND JUDY JEAN CHAPMAN SCHOLARSHIP was established in 2004 through the Estate of Grace McVeigh, B.A.'25, to provide need-based scholarship support for deserving students at the Vanderbilt University School of Medicine. Dr. John E. Chapman was a former dean of Vanderbilt University School of Medicine from 1975 until 2001. He died in 2004.

THE ALICE DREW CHENOWETH SCHOLARSHIP FUND was established in 1986 by Alice D. Chenoweth, M.D.'32, to provide scholarship support to students enrolled at the Vanderbilt University School of Medicine. Dr. Chenoweth was a pediatrician and a public health professional.

THE 1943 SCHOOL OF MEDICINE CLASS SCHOLARSHIP DECEMBER FUND was established in 1992 by multiple donors in the Vanderbilt University School of Medicine Class of 1943, December, to provide need-based scholarship support to deserving students at the School of Medicine.

THE SCHOOL OF MEDICINE CLASS SCHOLARSHIP MARCH FUND was established in 1992 by multiple donors in the Vanderbilt University School of Medicine Class of 1943, March, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine.

THE 1946 SCHOOL OF MEDICINE CLASS SCHOLARSHIP FUND was established in 1996 by multiple donors to provide scholarship support to students in the Vanderbilt University School of Medicine. This fund was established in celebration of the 50th reunion of the Vanderbilt University School of Medicine Class of 1946.

THE CLASS OF 1947 SCHOLARSHIP was established in 1988 by multiple donors to provide need-based scholarship support for deserving students at the Vanderbilt University School of Medicine.

THE 1948 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 1998 by multiple donors to provide scholarship support to students in the School of Medicine. This fund was established in celebration of the 50th reunion of the Vanderbilt University School of Medicine Class of 1948.

THE 1953 SCHOOL OF MEDICINE CLASS SCHOLARSHIP FUND was established in 2010 by multiple donors to provide need-based scholarship support for deserving medical students at the Vanderbilt University School of Medicine. The Vanderbilt University School of Medicine Class of 1953 would like to create a class legacy and provide the opportunity for a deserving student to have a Vanderbilt University School of Medicine education.

THE 1962 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors to provide financial support to deserving students at the Vanderbilt University School of Medicine. Through this scholarship, Vanderbilt University School of Medicine Class of 1962 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1963 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the Class of 1963 to provide scholarship support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Class of 1963 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1964 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 1989 by multiple donors to provide scholarship support to a student in the Vanderbilt University School of Medicine. This fund was established to celebrate the 25th reunion of the Class of 1964.

THE 1965 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2013 by various donors to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Vanderbilt University School of Medicine Class of 1965 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1966 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2011 by multiple donors from the School of Medicine Class of 1966 to provide financial support based on need or merit to deserving students at the Vanderbilt University School of Medicine. The Class of 1966 would like to create a class legacy and provide the opportunity for a deserving student to have a Vanderbilt University School of Medicine education.

THE 1967 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2011 by various donors to provide financial support based on need or merit for deserving students at the Vanderbilt University School of Medicine. Through this scholarship, the Class of 1967 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1968 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2013 through the bequest of Elise Moss Neeld, B.A.'63, M.D.'68, to provide financial support to students at the School of Medicine.

THE 1969 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2013 by various donors to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Vanderbilt University School of Medicine Class of 1969 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1971 SCHOOL OF MEDICINE CLASS SCHOLARSHIP FUND was established in 2012 by various donors to provide need or merit-based scholarship support to deserving students at the Vanderbilt University School of Medicine. Through this scholarship, the Class of 1971 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1972 SCHOOL OF MEDICINE CLASS SCHOLARSHIP FUND was established in 2013 by various donors to provide need or merit-based scholarship support to deserving students at the Vanderbilt University School of Medicine. Through this scholarship, the Class of 1972 will create a class legacy and provide an opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1974 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2014 by various donors to provide financial support based on need or merit for deserving M.D. or M.D./Ph.D. students at the School of Medicine.

THE 1975 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2010 by various donors to provide need-based scholarship support for deserving students at the Vanderbilt University School of Medicine. The Vanderbilt University School of Medicine Class of 1975 would like to create a class legacy and provide an opportunity for a deserving student to have a Vanderbilt University School of Medicine education.

THE 1976 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, Vanderbilt University School of Medicine Class of 1976

will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1977 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the Class of 1977 to provide scholarship support based on need or merit to deserving students in the School of Medicine. Through this scholarship, the Class of 1977 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1978 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2007 by multiple donors from the class of 1978 to provide scholarship support based on need for deserving students in the School of Medicine. Through this scholarship, the Class of 1978 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1979 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2010 by multiple donors to provide need-based scholarship support for deserving students at the Vanderbilt University School of Medicine. The Vanderbilt University School of Medicine Class of 1979 would like to create a class legacy and provide an opportunity for a deserving student to have a Vanderbilt University School of Medicine education.

THE 1981 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the Class of 1981 to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Class of 1981 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1982 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2011 by various donors to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Vanderbilt University School of Medicine Class of 1982 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1984 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2014 by various donors to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Vanderbilt University School of Medicine Class of 1984 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1986 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2011 by Rachel Lenox Mace, M.D.'86, and Gerald F. Mace, J.D.'85, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. This fund was established in honor of Dr. Mace's class reunion. The couple would like the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1987 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the class of 1987 to provide scholarship support based on need or merit for deserving students in the School of Medicine. Through this scholarship, the Class of 1987 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1988 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2008 by multiple donors from the Class of 1988's in honor of their 20th reunion to provide scholarship support based on need or merit for deserving students in the School of Medicine. Through this scholarship, the Class of 1988 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1989 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2010 by multiple donors to support the goal of endowing a need-based scholarship for deserving students at the School of Medicine. The Vanderbilt University School of Medicine Class of 1989 would like to create a class legacy and provide an opportunity for a deserving student to have a Vanderbilt University School of Medicine education.

THE 1990 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2010 by multiple donors to provide need-based scholarship support for deserving students at the Vanderbilt University School of Medicine. The Vanderbilt University School of Medicine Class of 1990 would like to create a class legacy and provide an opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1991 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by various donors to provide need or merit-based scholarship support to deserving students at the Vanderbilt University School of Medicine. Through this scholarship, the Vanderbilt University School of Medicine Class of 1991 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1992 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the Class of 1992 to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the Class of 1992 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE DAVID FREEDY 1993 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 1992 by multiple donors to provide merit-based scholarship support to deserving students at the Vanderbilt University School of Medicine. This fund was established in memory of Dr. David Freedy, a member of the of Class of 1993.

THE 1994 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2013 by multiple donors to provide financial support based on need or merit for deserving students at the School of Medicine. Through this scholarship, the School of Medicine Class of 1994 will create a class legacy and provide the opportunity for deserving students to have a School of Medicine education.

THE 1996 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the Class of 1996 to provide scholarship support based on need or merit to deserving students at the School of Medicine. Through this scholarship, the Class of 1996 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 1997 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the Class of 1997 to provide scholarship support based on need or merit to deserving students at the School of Medicine. Through this scholarship, the Class of 1997 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 2001 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2012 by multiple donors from the class of 2001 to provide scholarship support based on need or merit for deserving students in the School of Medicine. Through this scholarship, the Class of 2001 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 2002 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2011 to support scholarships based on need or merit for deserving students in the School of Medicine. Through this scholarship, the Class of 2002 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE 2006 SCHOOL OF MEDICINE CLASS SCHOLARSHIP was established in 2011 to provide scholarship support based on need or merit for deserving students in the School of Medicine. Through this scholarship, the Class of 2006 will create a class legacy and provide the opportunity for deserving students to have a Vanderbilt University School of Medicine education.

THE ROBERT D. COLLINS, M.D. SCHOLARSHIP FUND was established 1996 by multiple donors to provide scholarship support to students attending the Vanderbilt University School of Medicine. The fund was established to honor Robert D. Collins, B.A.'48, M.D.'51, a distinguished and admired longtime professor of pathology. During his fifty-six year career at Vanderbilt University School of Medicine (1957–2013), Dr. Collins taught generations of

medical students, established the Division of Hematopathology at Vanderbilt, and trained fellows who are leaders in this field today. He passed away in 2013.

THE COMMONWEALTH FUND SCHOLARSHIP ENDOWMENT was established by the Commonwealth Fund to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine.

THE MARVIN B. AND MILDRED G. CORLETTE SCHOLARSHIP was established in 2003 by Marvin B. Corlette, B.A.'30, M.D.'33, to provide financial support to students at the Vanderbilt University School of Medicine.

THE LOUISE WILLIAMS COUCH MEMORIAL SCHOLARSHIP was established in 1962 by Dr. Orrie A. Couch to provide scholarship support for students at the Vanderbilt University School of Medicine. Originally this fund was established to support students at Peabody College. The fund was transferred to the Vanderbilt University School of Medicine in 1998 at the donor's request.

THE DEBORAH AND C. A. CRAIG II MEDICAL SCHOLARSHIP FUND was established in 1992 by C. A. Craig II, B.A.'51, and his wife, Deborah Wallace Craig, B.S.'69, to provide scholarship support to talented and deserving students pursuing an M.D. degree at the Vanderbilt University School of Medicine. Preference in awarding should be given to students who were Eagle Scouts.

THE JACK DAVIES SCHOLARSHIP FUND was established in 1991 by multiple donors to provide scholarship support to medical students at the Vanderbilt University School of Medicine. Medical School graduates, specifically those from the classes of 1981, 1982, 1983, 1984 and 1994, endowed this fund in memory of Dr. Jack Davies, a Vanderbilt professor from 1963–1989.

THE JOE C. DAVIS SCHOLARSHIP was established in 1986 by an anonymous donor as the William R. and Ann Bond DeLoache Scholarship Fund to provide merit and need-based scholarship support to students at the Vanderbilt University School of Medicine. After the 1991 death of former Vanderbilt University Board of Trust member Joe C. Davis Jr., B.A.'41, William R. DeLoache, B.A.'41, M.D.'43, requested that the name be changed to the Joe C. Davis Scholarship to recognize his contributions to the university and the Vanderbilt University School of Medicine. To be eligible, the candidate must have had legal residence from a Southeastern state to include Kentucky, Tennessee, Mississippi, Alabama, North or South Carolina, Georgia or Florida. Joe C. Davis was considered to be among the most talented athletes to have competed at Vanderbilt, having won 35 titles and three consecutive SEC championships in singles tennis. He also played on the varsity basketball team. After completing his studies at Vanderbilt, Davis began his professional career with the Nashville Coal Company. He went on to found the Webster County Coal Corp., a business he sold in 1971. Deeply committed to education and health care, Davis established the Joe C. Davis Foundation in 1976.

THE ANNETTE SCHAFFER ESKIND SCHOLARSHIP was established in 2011 by Annette Schaffer Eskind to provide financial support based on need or merit for deserving students at the Vanderbilt University School of Medicine. This gift honors the Eskind family's close personal connection to the Vanderbilt University School of Medicine and the Vanderbilt University Medical Center.

THE HERBERT AND FLORENCE ESKIND MEMORIAL SCHOLARSHIP was established in July 1971 as the Herbert Eskind Memorial Fund by Mrs. Herbert Eskind, A 1928, and family to provide need-based scholarship support for deserving students at the School of Medicine. The scholarship was initially established to honor the memory of Mr. Herbert Eskind who passed away in 1971. The Eskind family requests the scholarship be awarded to a student on the exclusive basis of strict financial need. In August 2002, following the death of Mrs. Herbert Eskind Zucker, the name of the fund was changed to the Herbert and Florence Eskind Memorial Scholarship Fund through a request made by Dr. Irwin Eskind.

THE ROBERT SADLER-WILLIAM EWERS SCHOLARSHIP FUND was established in 1987 by Mr. and Mrs. W. Fred DeLay to provide scholarship support to worthy male students at the School of Medicine. This fund was established in honor of Robert Sadler, M.D.'47, and William Ewers, B.A.'46, M.D.'48.

THE J. F. FOX MEDICAL SCHOOL SCHOLARSHIP FUND was established in 1967 through the estate of Mrs. Hallie Fox to provide merit and need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. A committee comprising of the Dean of the School of Medicine and the Associate Dean for Medical Education along with the Board of Trust will select scholarship recipients. This scholarship was established in memory of J. F. Fox, M.D. 1898.

THE THOMAS F. FRIST, SR., M.D. SCHOLARSHIP was established in 2006 by Mr. and Mrs. H. Lee Barfield to provide scholarship support to deserving students at the Vanderbilt University School of Medicine. This scholarship was established in memory of Thomas F. Frist Sr., M.D., a pioneer in the world of for-profit health care and founder of the Hospital Corporation of America in 1968.

THE GHERT-ROUSSEAU FAMILY SCHOLARSHIP FUND was established in 2010 by Michelle A. Ghert, M.D.'96, to provide financial support for deserving medical students at the School of Medicine.

THE D. G. GILL SCHOLARSHIP FUND was established in 1982 by Gordon Nelson Hill, B.A.'60, M.D.'63, Richard Hamilton Gill, B.A.'62, and Charles Leigh Gill to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. First preference will be awarded to students who have expressed an interest in public health. This fund was established in honor of the donors' father, Dr. D. G. Gill, who had a lifelong interest in public health and the providing of health care to rural areas of America. Dr. Gill was widely acknowledged as an outstanding physician who saved countless lives and improved their general health.

THE FRED GOLDNER, M.D. SCHOLARSHIP quasi account was established in 2013 to receive matching gifts from the Mary K. Parr Scholarship Matching Gift Program that was established to inspire donors to make a gift towards School of Medicine scholarships.

THE DRS. FRANK LUTON AND CLIFTON GREER SCHOLARSHIP was established in 1995 through the estate of Clifton Greer, M.D.'51, to provide need-based financial aid to students at the Vanderbilt University School of Medicine. This fund was established in honor of Frank Luton, M.D.'27. Dr. Frank Luton worked as a professor of psychiatry from 1930–1964. He also served as neurologist and Psychiatrist-in-Chief at the Vanderbilt University Hospital from 1942–1956. Preference in awarding will be given to students from the Southeastern region of the United States.

THE HARRY J. GUFFEE SCHOLARSHIP FUND was established in 1991 by the Williamson Medical Center to provide scholarship support for deserving students at the Vanderbilt University School of Medicine from Williamson County or whose parents currently reside in Williamson County. The scholarship will be awarded on the basis of need, academic achievement, community service and leadership abilities. The fund was established to honor Dr. Harry J. Guffee, B.A.'35, M.D.'39, who served in the U.S. Army during World War II and was instrumental in setting up early hospitals during the war. After the war, Dr. Guffee helped establish the Dan German Hospital and, in 1959, was on the initial medical staff at Williamson County Hospital.

THE SCOTT AND TRACIE HAMILTON SCHOLARSHIP was established in 2012 by the Pioneer Fund to provide need-based scholarship support for deserving M.D. or M.D./Ph.D. students at the School of Medicine. The Donor wishes to provide financial support to aspiring medical students who could not pursue their careers without the financial help provided by the scholarship. The Pioneer Fund was established in 1960 by Helen McLoraine, a pioneer in her own right in the oil industry. Helen invested in helping people achieve their goals during her life, and the Pioneer Fund continues her legacy. Directed by trustees, Scott and Tracie Hamilton, the fund will support medical students as they pursue their careers as leaders in the medical field. This gift reflects the Hamiltons' appreciation for Helen McLoraine, and the example that Dr. Jeffrey R. Balse and his career exemplify.

THE GLENN AND VIRGINIA HAMMONDS SCHOLARSHIP was established in 1984 by Dr. R. Glenn Hammonds, B.A.'42, M.D.'44, to provide financial scholarship support to deserving students at the Vanderbilt University School of Medicine. Dr. Hammonds was the co-founder of the Miller Medical Group, where he practiced for 38 years before retiring in

1989. This scholarship was established in gratitude of Dr. Hammonds time at Vanderbilt.

THE FRANK M. HANDLEY MEDICAL SCHOOL SCHOLARSHIP was established in 1999 through the estate of Frank M. Handley, J.D.'28, to provide scholarship support for students at the Vanderbilt University School of Medicine.

THE EMILY AND H. CAMPBELL HAYNIE SCHOLARSHIP was established in 2002 through a bequest from Harold Campbell Haynie, B.A.'34, to provide scholarship support for deserving students at the Vanderbilt University School of Medicine.

THE JAMES HOLLORAN SCHOLARSHIP was established in 1990 by multiple friends and family member from the Class of 1990 to provide scholarship support to deserving students at the Vanderbilt University School of Medicine. Donors established this fund in memory of James Edward Holloran, a member of the Class of 1980 who died in his fourth year.

THE HARRY R. JACOBSON, M.D. AND JAN JACOBSON SCHOLARSHIP was established in 2004 through the estate of Grace McVeigh, B.A.'25, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. This scholarship was created in honor of former Vice Chancellor for Health Affairs, Dr. Harry R. Jacobson and his wife, Jan Jacobson.

THE HOLLIS E. JOHNSON AND FRANCES SETTLE JOHNSON SCHOLARSHIP FUND was established in 1990 by Dr. Hollis E. Johnson, M.D.'21, to provide scholarship support to worthy students at the Vanderbilt University School of Medicine.

THE ERNEST G. AND MIRIAM H. KELLY SCHOLARSHIP FUND was established in 2008 by Dr. and Mrs. Ernest G. Kelly to support scholarships for students at the Vanderbilt University School of Medicine.

THE EARL A. AND FRANK B. KIMZEY SCHOLARSHIP was established in 1989 and the bequest realized in 2012 through the estate of Mrs. Frances K. Riley to provide merit-based scholarship support for deserving students at the Vanderbilt University School of Medicine.

THE IKE J. KUHN SCHOLARSHIP was established in 1946 through the bequest of Ike J. Kuhn to provide scholarship support to a worthy male or female student at the Vanderbilt University School of Medicine. Preference in awarding should be given to students born and raised in any of the states commonly known as the 'Southern' states.

THE ANN LIGHT SCHOLARSHIP FUND was established in 1983 by Mrs. Ann Light to provide scholarship support to students at the School of Medicine.

THE DORIS M. AND FRED W. LOVE HONOR SCHOLARSHIP was established in 2015 through the estates of Doris M. Love and Fred W. Love, M.D.'45, to provide financial support based on merit for deserving M.D. or M.D./Ph.D. students at the School of Medicine.

THE CHARLES T. LOWE SCHOLARSHIP FUND was established in 2003 through the bequest of Charles T. Lowe, B.A.'32, M.D.'36, H.O.'36, to provide scholarship support to students at the Vanderbilt University School of Medicine. Preference when awarding the scholarship will be given to students from Dallas County, Arkansas, or Wilson County, Tennessee, or in the event that there are no qualified students from either of these counties, a scholarship may be awarded to a qualified student residing in a county surrounding Wilson County, Tennessee.

THE LUX SCHOLARSHIP FOR ORAL SURGERY was established in 1990 through the bequest of Konrad Lux, M.D.'25, to provide scholarships for worthy and qualified students in the graduate program of Oral Surgery at the Vanderbilt University School of Medicine.

THE THOMAS L. MADDIN, M.D., FUND was established in 1944 through the realized bequest of Mrs. Sallie A.C. Watkins to provide scholarship assistance to male students at the Vanderbilt University School of Medicine. This fund was established in memory of Dr. Thomas L. Maddin, 1826–1908. A skilled surgeon effective in hospital management, Dr. Maddin was appointed in 1868 to the chair of the institutes of medicine in the Medical Department of the University of Nashville. In 1873, when its medical department merged with

Vanderbilt University, Dr. Maddin was appointed to the chair of the theory and practice of medicine and was chosen as president of the faculty. When the Medical Department of the University of Nashville reestablished its independence in 1895, he remained there until 1905 when he retired as its professor of nervous diseases. He passed away in 1908.

THE JACK MARTIN SCHOLARSHIP FUND was established in 1989 by Murphy Baxter to provide need-based scholarship support to students in the Vanderbilt University School of Medicine. This fund was established in honor of Jack Martin, M.D.'53.

THE MARGARET LOONEY MCALLEN SCHOLARSHIP was established in 2005 by Dr. C. Ashley McAllen, M.D.'87, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. It is the Donor's desire that the Margaret Looney McAllen Scholarship provide support for one student per academic year.

THE ROBERT L. AND BILLYE MCCRACKEN SCHOLARSHIP FUND was established in 2003 by Dr. Robert L. McCracken, M.D.'39, to provide scholarship support for students at the Vanderbilt University School of Medicine.

THE PATRICIA AND EDWARD J. MCGAVOCK SCHOLARSHIP was established in 2000 through the bequest of Mrs. Patricia Warren McGavock to provide scholarship support to students at the Vanderbilt University School of Medicine.

THE CHARLES AND EDITH MCGILL SCHOLARSHIP FUND was established in 2000 through the trust of Dr. Charles M. McGill, M.D.'35, and Mrs. Edith McGill to provide scholarship support to students at the Vanderbilt University School of Medicine.

THE BARTON MCSWAIN ENDOWED SCHOLARSHIP was established in 1994 by multiple donors to provide need-based scholarships to students at the School of Medicine. This scholarship was established in honor of Barton McSwain, M.D.'30, an expert in surgical pathology and former professor at the Vanderbilt University School of Medicine.

THE BESS AND TOWNSEND A. MCVEIGH SCHOLARSHIP FUND was established in 1977 by Miss Grace McVeigh, B.A.'25, to provide full-tuition, four-year scholarships for the benefit of needy and worthy students at the Vanderbilt University School of Medicine. Miss McVeigh established this fund in memory of her parents. She passed away in 1999. Miss McVeigh once considered a career in medicine and was even accepted to VUSM. Family obligations kept her from that path, so, armed with her Vanderbilt degree in biochemistry, she launched a nearly 30-year career as a geophysicist for the Atlantic Richfield Co. (ARCO), studying charts to determine where precious oil might be found. Miss McVeigh's work took her to South America and the Middle East. She contributed to the analysis of data that eventually led to the discovery of the rich oil fields near Prudhoe Bay, Alaska. Though her long and successful career carried her across the globe in search of untapped reserves of oil, Grace McVeigh's heart was never far from Vanderbilt University Medical Center.

THE MEDICAL STUDENT SCHOLARSHIPS GIFT FUND was established by various donors to provide financial support to students at the School of Medicine.

THE H. HOUSTON MERRITT SCHOLARSHIP FUND was established in 1990 through the estate of Mr. and Mrs. H. Houston Merritt to provide scholarship support for worthy students at the Vanderbilt University School of Medicine. Dr. H. Houston Merritt graduated from the College of Arts and Science in 1922.

THE JAMES PRESTON MILLER SCHOLARSHIP FUND was established in 1960 by the bequest of Mr. James P. Miller to provide scholarship support to deserving young men and women to obtain medical training in the School of Medicine at Vanderbilt University. Mr. Miller established this fund in memory of his father, Mr. James Preston Miller. Residents of Overton County, Tennessee, are to be given first preference and residents of Tennessee at large are to be given second preference.

THE ANN MINOT ENDOWED SCHOLARSHIP was established in 1994 by multiple donors to provide need-based scholarships to students at the Vanderbilt University School of Medicine. Ann Minot (1894–1980) was

a clinical chemist, teacher, and investigator at Vanderbilt University. Her wide research interests included protein deficiency, Vitamin C deficiency, myasthenia gravis, and tocopherol. She also established the first blood bank at Vanderbilt.

THE BARBARA D. MURNAN MEMORIAL SCHOLARSHIP FUND was established by Barbara D. Murnan, B.A.'34, to provide merit-based financial support to medical students specializing in cancer research or related fields at the School of Medicine.

THE COLEMAN D. OLDMAN HONOR SCHOLARSHIP FUND was established in 1997 through the liquidation of the Life Income Agreement of Coleman D. Oldham and his sister Emma C. Oldham to provide merit-based scholarship support to worthy students at the Vanderbilt University School of Medicine. Preference should be awarded to male students from Madison County, Kentucky, or if none are available, then to worthy male students from the State of Kentucky. Coleman and Emma Oldham also established scholarships at the College of Arts and Science and the School of Nursing.

THE C. LEON AND JUDITH S. PARTAIN SCHOLARSHIP FUND was established in 1998 by Grace McVeigh, B.A.'25, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. This scholarship honors C. Leon Partain, M.D., and Judith S. Partain for their service to Vanderbilt University Medical Center during his tenure as chairman of the Department of Radiology and Radiological Sciences, 1992–2000. Grace McVeigh worked for Atlantic Richfield Co. as a geophysicist, but her passion was for need-based scholarships for students at Vanderbilt.

THE JONATHAN O. PARTAIN M.D. AND VIRGINIA G. PARTAIN SCHOLARSHIP was established in 2012 by Jonathan O. Partain, B.A.'57, M.D.'60, H.O./F.E.'60, to provide financial support based on need or merit for deserving students at the Vanderbilt University School of Medicine.

THE ALICE AND V. K. PATTERSON SCHOLARSHIP was established in 2012 by David W. Patterson, B.S.'81, M.D.'85, and Linda S. Young, B.A.'81, to provide financial support based on need or merit for deserving students at the School of Medicine. This fund was established in memory of Dr. Patterson's parents and to celebrate their lifelong commitment to education. It is the donors' preference that the Patterson Scholarship be awarded to underrepresented minority students at Vanderbilt University School of Medicine, with a special emphasis on need-based scholarship awards. Donors hope that their gift will inspire others to join them in supporting medical scholarships at Vanderbilt University and to share their personal commitment to diversity in medical education. Dr. Patterson is a member of the Vanderbilt University Board of Trust.

THE HARVEY M. FLEET AND FRANK E. PHILLIPY SCHOLARSHIP was established in 2014 by Robert A. Johnson, M.D.'57, to provide financial support based on need or merit for deserving students at the School of Medicine. Dr. Johnson established this scholarship to honor the memory of his classmates Harvey M. Fleet, M.D.'57, and Frank E. Phillipy II, M.D.'57, who passed away before they were able to begin practicing medicine.

THE PIDWELL FAMILY SCHOLARSHIP FUND was established in 1999 by Mr. and Mrs. David W. Pidwell to provide need-based scholarship support to students at the Vanderbilt University School of Medicine. It is the donors' preference that the scholarship remain with the same student during their entire time as a medical student. Pidwell Scholars should also be considered based on the following: exhibiting strength of character, having a commitment to community service, showing specific interest in entrepreneurial business development targeting life sciences, demonstrating financial need, and having U.S. citizenship.

THE ELIZABETH CRAIG PROCTOR SCHOLARSHIP was established in 2002 by Elizabeth Proctor to provide scholarship support to a worthy medical student at the Vanderbilt University School of Medicine.

THE DARLINE AND ROBERT RASKIND SCHOLARSHIP was established in 2012 through the bequest of Doris Darline Raskind and Robert Raskind, M.D.'38, to provide scholarship support for deserving students at the Vanderbilt University School of Medicine.

THE THOMAS W. RHODES FELLOWSHIP was established in 1958 through the bequest of Georgianna C. Rhodes to support one or more fellowships at the Vanderbilt University School of Medicine. This fund was established in memory of Georgianna C. Rhodes's husband, Thomas W. Rhodes.

THE RILEY SCHOLARSHIP was established in 1980 by members of the Riley family including Dr. Harris D. Riley Jr., B.A.'45, M.D.'48, Frank Riley, B.A.'49, Richard F. Riley, B.A.'46, M.D.'48, and William G. Riley, B.A.'43, M.D.'45, to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. Dr. Harris D. Riley was a professor of pediatrics, emeritus, and longtime supporter of Vanderbilt University who passed away in 2010.

THE CANBY ROBINSON SCHOLARSHIPS were established in 1986 to provide financial support for deserving students at the School of Medicine.

THE ROSCOE R. ROBINSON M.D. AND ANN ROBINSON SCHOLARSHIP was established in 1999 through a bequest from Grace McVeigh, B.A.'25, to provide four-year, need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. This scholarship honors Dr. Roscoe R. Robinson and Ann Robinson for their service to Vanderbilt Medical Center during his tenure as Vice Chancellor for Medical Affairs (1981–1997).

THE DAVID E. AND BARBARA L. ROGERS ENDOWED SCHOLARSHIP was established in 2003 by Mrs. Barbara Rogers to provide scholarship support to deserving students at the Vanderbilt University School of Medicine. This fund was created in memory of Dr. David E. Rogers, Chairman of the Department of Medicine from 1959–1968.

THE HELEN W. AND LOUIS ROSENFELD ENDOWMENT SCHOLARSHIP FUND was established in 1984 by Helen Rosenfeld, B.A.'34 and Louis Rosenfeld, B.A.'33, M.D.'36, to provide need-based scholarship support to students at the School of Medicine.

THE GEORGE E. ROULHAC MEMORIAL SCHOLARSHIP FUND was established in 1995 through a bequest gift from Dr. George E. Roulhac, B.A.'36, M.D.'39, to provide scholarship support to students in the Vanderbilt University School of Medicine.

THE WILLETT H. "BUDDY" RUSH SCHOLARSHIP was established in 1987 by Martha H. Rush to provide need-based scholarship support to deserving students at the School of Medicine. Preference in awarding should be to students from Frankfurt, Kentucky, the Blue Grass region of Kentucky, and then the state of Kentucky. Should there come a time when there is no student from Kentucky with financial need, the income from the scholarship in that year is to be returned to the corpus.

THE RICHARD M. SCOTT SCHOLARSHIP FUND was established in 1988 by multiple donors, including Vanderbilt University School of Medicine students, to provide need-based scholarship support for deserving students at Vanderbilt University School of Medicine. This scholarship was established in honor of Richard M. Scott, former director of financial aid for the School of Medicine.

THE JOHN SECONDI SCHOLARSHIP FUND was established in 1987 by multiple donors to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine. This fund was established in memory of John Secondi, M.D.'70, who passed away in April 1985.

THE JOHN N. SHELL ENDOWMENT FUND was established in 1980 by John N. Shell, M.D.'28, and Marion S. Shell to provide support to defray expenses of worthy medical students at the Vanderbilt University School of Medicine.

THE ETHEL AND LOUIS SHIVITZ SCHOLARSHIP was established in 2012 by Ira Alan Shivitz, M.D.'78, to provide financial support based on need or merit for deserving students at the School of Medicine. It is the donor's preference that the Fund be awarded to students enrolled at the School of Medicine who meet the university's requirement for need-based scholarship assistance and are citizens of the United States. In addition, the scholarship will request, but not direct, that preference be given to students who encourage diversity through their commitment to lesbian, gay,

bisexual, transgender (LGBT) awareness at Vanderbilt. This dedication may be exhibited but not limited to personal identification as a lesbian, gay, bisexual, or transgender (LGBT) individual or to a student who promotes non-discrimination and human rights for all individuals, regardless of their race, sex, religion or religious beliefs, color, national or ethnic origin, age, disability, sexual orientation, gender identity, or gender expression. Donor established the scholarship to honor his late parents, Ethel and Louis Shivitz, for their lifelong dedication to education and their acceptance and enduring support for their son. In addition, Dr. Shivitz is providing this scholarship to support students who share his commitment to promote non-discrimination across the School of Medicine.

THE DR. LESLIE M. AND EVELYN C. SMITH MEDICAL SCHOLARSHIP was established in 1998 by Evelyn Clark Smith, widow of Dr. Leslie McClure Smith, M.D.'30, to provide need-based financial support for medical students at the School of Medicine. Preference in awarding should be given to students from New Mexico and Kentucky.

THE DR. FRANK C. AND CONNIE EWELL SPENCER MEDICAL SCHOLARSHIP was established in 1997 by Frank Cole Spencer, M.D.'47, and his wife, Connie Ewell Spencer, B.A.'46, to provide need-based scholarship support to worthy students at the School of Medicine. The fund was established to honor the Medical School Class of 1947 on the occasion of its 50th reunion.

THE K. DOROTHEA AND JOSEPH G. SUTTON SCHOLARSHIP IN MEDICINE was established in 1995 through the bequest of Joseph Guy Sutton and Dorothea O. Sutton to provide need-based scholarship support to deserving students at the Vanderbilt University School of Medicine.

THE HARLAN HOWARD TAYLOR SURGICAL SCHOLARSHIP FUND was established in 1987 by multiple donors including Dr. Harlan Howard Taylor, B.A.'23, M.D.'26, and his wife, Mrs. Elizabeth Parks Taylor, to provide need-based scholarship support to fourth-year students going into surgical fields at the Vanderbilt University School of Medicine.

THE BETTYE SUE AND JOHN C. THORNTON JR. SCHOLARSHIP was established in 2013 by John C. Thornton, Jr., B.A.'37, M.D.'40, to provide scholarship support to deserving students at the Vanderbilt University School of Medicine.

THE VANDERBILT MEDICAL SCHOOL SCHOLARSHIP FUND was established in 2001 by multiple donors to provide need-based scholarship support to deserving students in the Vanderbilt University School of Medicine.

THE ANDREW WM. WALKER, M.D. SCHOLARSHIP was established in 2010 by Andrew William Walker, M.D.'60 to provide financial support for deserving students at the Vanderbilt University School of Medicine.

THE IRENE GEORGIA BEDFORD WATERS SCHOLARSHIP was established in 2003 by Dr. William Bedford Waters, M.D.'74 in honor of his mother, Irene. The fund will provide need-based financial support for deserving students at the Vanderbilt University School of Medicine with a preference towards underrepresented minority students.

THE FRED WATSON MEMORIAL SCHOLARSHIP was established through the bequest of Malvina A. Watson in honor of her late husband, Fred Cecil Watson, M.D.'06, to provide need-based scholarship support for deserving students at Vanderbilt University who are residents of Henderson County, Tennessee. A selection committee composed of the principal of Lexington (Tennessee) High School, the president of the First National Bank (or its successor) of Lexington, Tennessee, and the minister of the First Baptist Church of Lexington, Tennessee (the "Selection Committee"), shall determine the awarding as per the will. Preference in awarding shall be given to 1) medical students at Vanderbilt University who were graduates of Lexington (Tennessee) High School, 2) medical students at Vanderbilt University who did not graduate from Lexington (Tennessee) High School but are residents of Henderson County, Tennessee, 3) students who attended Lexington (Tennessee) High School at any time who study in other fields of endeavor while attending Vanderbilt University and 4) all other persons attending Vanderbilt University who resided in Henderson County, Tennessee, at any time before attending Vanderbilt University.

THE JOE AND HOWARD WERTHAN FOUNDATION SCHOLARSHIP FUND was established in 1958 by the Joe and Howard Werthan Foundation to provide need-based scholarship support to students in the Vanderbilt University School of Medicine. The Werthan family is known for their philanthropic support of Vanderbilt University and other organizations in the fields of health, welfare, and education.

THE JONI P. WERTHAN SCHOLARSHIP was established in 2010 by Ms. Joni P. Werthan to provide scholarship support to one or more outstanding student(s) at the School of Medicine who demonstrate a passion for serving the indigent patient population. The scholarship was established in honor of Martha Cheatham, a beloved friend of Ms. Werthan.

THE JAMES WHITAKER WEST SCHOLARSHIP was established in 2001 by Mrs. Ruth B. West, A 1949, and Dr. John Thomas West, B.A.'49, M.D.'51, to provide financial support based on need or merit for deserving students at the Vanderbilt University School of Medicine. The scholarship honors the memory of Dr. West's father, Dr. James Whitaker West, M.D.'05.

THE DAVID HITT WILLIAMS M.D. MEMORIAL SCHOLARSHIP FUND was established in 1998 through a bequest gift from Ms. Eugenia Williams to provide scholarship support for worthy and deserving students enrolled at Vanderbilt University School of Medicine. Mrs. Williams established this fund in memory of her father, David Hitt Williams.

THE WILLS SCHOLARSHIP was established in 2003 by Mr. and Mrs. Ridley Wills II through The Wills Foundation to provide need-based scholarship support for deserving students at the Vanderbilt University School of Medicine. Mr. Ridley Wills II, A.S.'56 and emeritus member of the Vanderbilt University Board of Trust, and Mrs. Irene Jackson Wills created the scholarship because of the wonderful education their son, Morgan Wills, M.D.'96, received and in recognition of their respective families who were associated with the School of Medicine in past decades.

THE CHARLES E. AND MILDRED WORK SCHOLARSHIP was established in 2001 by through the bequest of Charles E. Work, M.D.'35, to provide scholarship support to deserving students at the Vanderbilt University School of Medicine.

Other Scholarships

Other scholarships are available outside of the institutional financial aid program. They are as follows:

THE MELINDA AND JEFFREY BALSER M.D./PH.D. SCHOLARSHIP was established in 2010 by Melinda S. and Jeffrey R. Balsler, M.D., Ph.D.'90, to provide financial support for deserving students at the School of Medicine. Dr. Balsler returned to Vanderbilt in 1998 and served as associate dean for physician scientists and was appointed the Gwathmey Professor and chair of anesthesiology in 2001. In 2008, he became the eleventh dean of the School of Medicine since its founding in 1875 and, in 2009, became vice chancellor for health affairs, overseeing all health-related programs at Vanderbilt University. Currently, he is president and CEO of VUMC after a reorganization in 2016.

THE ESSERMAN FAMILY MEDICAL SCHOLARSHIP was established in 2013 by Ivette C. and Charles H. Esserman to provide financial support based on need or merit for deserving M.D. or M.D./Ph.D. students at the School of Medicine. Mr. Charles Esserman's service to Vanderbilt includes serving as a member on the Vanderbilt University Board of Trust.

THE GOODMAN FAMILY MEDICAL EDUCATION FUND was established in 2010 by the Mt. Brilliant Family Foundation to support educational scholarship to facilitate the training of leaders and scholars in medicine at the School of Medicine.

THE MARY AND WILLIAM O. INMAN, JR. SCHOLARSHIP FUND was established in 1985 by Grace McVeigh, B.A., to provide scholarship support to M.D./Ph.D. students at the Vanderbilt University School of Medicine. This fund was established in honor of Dr. William O. Inman Jr. and his wife, Mrs. Mary Inman.

THE MEADE HAVEN CHARITABLE TRUST M.D./PH.D. SCHOLARSHIP was established in 1977 by Jesse E. Wills to provide scholarship support for medical students in the M.D./Ph.D. program who have made a serious career commitment to obtain advanced experience and training in research in the biomedical sciences. Jesse E. Wills was a successful businessman, poet, life member of the Vanderbilt University Board of Trust, and for ten years chairman of the board of the Joint University Libraries. In college, he was a member of a group of poets who published *The Fugitive* magazine and were to become famous as the Fugitive Poets. He died in 1977.

THE ANN MELLY SUMMER SCHOLARSHIP IN ONCOLOGY was established in 1987 through the estate of Dr. Marian Ann Melly, Ph.D.'69, to provide support to deserving medical students who are conducting research in the field of oncology at the Vanderbilt University School of Medicine. Melly Scholars, the scholarship recipients, receive an integrative experience linking the basic sciences with their clinical outcomes and in-depth exposure to research that addresses the cause and treatment of cancer. This scholarship was established to recognize Dr. Melly's work in the field of research and her special concern with the education of medical students.

THE BARBARA R. AND GLENN H. MERZ SCHOLARSHIP was established in 2010 by Barbara R. and Glenn H. Merz to provide financial support for deserving M.D./Ph.D. students at the Vanderbilt University School of Medicine. This scholarship reflects Barbara and Glenn Merz's commitment to educating and developing physician-scientists, as well as the conviction that excellence in medical research and practice can meet human needs, relieve suffering, and provide hope.

THE HERBERT M. SHAYNE ENDOWMENT was established in 2003 by the Shayne Foundation to provide scholarship support for two M.D./Ph.D. students at the Vanderbilt University School of Medicine. These students are to be known as the Herbert M. Shayne Scholars. The Herbert M. Shayne Scholarships are intended for the education of exceptionally gifted physician-scientists.

THE TRANSLATIONAL BIOCHEMISTRY ENDOWED RESEARCH AND SCHOLARSHIP FUND was established in 2010 by Janet and J. William Freytag in honor of Dr. Billy G. Hudson to support research and scholarship at the School of Medicine. The fund will support a faculty member or student at the School of Medicine at Vanderbilt working in the area of translational biochemistry, with a primary focus in the area of matrix biology.

THE THOMAS HUGGINS WINN SCHOLARSHIP FUND was established in 1990 from the estate of Fanny Edith Winn to provide scholarship support to M.D./Ph.D. students at the Vanderbilt University School of Medicine. This fund was established in memory of Fanny Edith Winn's father, Thomas Huggins Winn, a 1883 graduate of the School of Medicine.

Revolving Loans

THE AMA/ERF LOAN FUND was established to provide loan funds to students at the School of Medicine.

THE F. TREMAINE BILLINGS STUDENT LOAN FUND was established in 1995 by Mr. William H. Thompson, Jr., M.A.'57, to provide loan funds to students at the School of Medicine. This fund was named for Dr. F. Tremaine Billings.

THE BLOSSOM CASTER LOAN FUND was established by Milton P. Caster, M.D.'49, to provide loan funds to students at the School of Medicine. This fund was established in memory of Dr. Caster's mother, Blossom Caster.

THE FRANK M. DAVIS AND THEO DAVIS STUDENT LOAN FUND was established in 1987 by Frank M. Davis, B.A.'30, M.D.'34, in the School of Medicine.

THE MAX EISENSTAT REVOLVING STUDENT LOAN FUND was established in 1990 by Mrs. Adella H. Eisenstat to provide loan funds to students at the School of Medicine. This fund was established in memory of Dr. Max Eisenstat.

THE MEDICAL SCHOOL STUDENT AID LOAN FUND was established to provide loan funds to students at the School of Medicine.

THE DR. LEO SCHWARTZ REVOLVING LOAN FUND was established by Leo Schwartz, Jr., M.D.'26, in the School of Medicine.

THE ROBERT E. SULLIVAN MEMORIAL LOAN FUND was established in 1990 by Dr. George W. Shelton, M.D.'35, to provide loan funds to students at the School of Medicine. This fund was established in memory of Robert E. Sullivan.

THE ROANE/ANDERSON COUNTY MEDICAL SOCIETY FUND was established to provide loan funds to students at the School of Medicine.

Financial Information for School of Medicine Master's and Other Doctoral Degrees

Information for the 2016/2017 academic year is as follows.

Doctor of Audiology and Master of Education of the Deaf and Master of Science (Speech-Language Pathology)

| | |
|--|----------|
| Tuition, 1st, 2nd, 3rd years | \$36,624 |
| Tuition, 4th year | 7,250 |
| Special, Non-Degree Seeking (per credit hour) | 1,434 |
| The total estimated cost of attendance for a first year student is \$69,238. | |

Master of Science in Medical Physics

| | |
|--|----------|
| Tuition, 1st year | \$34,446 |
| Tuition, 2nd year | 22,970 |
| Special, Non-Degree Seeking (per credit hour) | 1,434 |
| The total estimated cost of attendance for a first year student is \$67,060. | |

Doctor of Medical Physics

| | |
|--|----------|
| Tuition, 1st, 2nd years | \$35,874 |
| Tuition, 3rd, 4th years | 30,144 |
| Special, Non-Degree Seeking (per credit hour) | 1,434 |
| The total estimated cost of attendance for a first year student is \$68,488. | |

Master of Public Health and Master of Science in Clinical Investigation

| | |
|--|----------|
| Tuition, 1st year | \$34,500 |
| Tuition, 2nd year | 17,250 |
| Special, Non-Degree Seeking (per credit hour) | 1,434 |
| The total estimated cost of attendance for a first year student is \$66,600. | |

Master of Science in Applied Clinical Informatics

| | |
|--|----------|
| Tuition, 1st year | \$41,250 |
| Tuition, 2nd year | 13,750 |
| Special, Non-Degree Seeking (per credit hour) | 1,434 |
| The total estimated cost of attendance for a first year student is \$73,350. | |

Master of Laboratory Investigation

| | |
|--|----------|
| Tuition (12 hours at \$1,434/hr.) | \$17,208 |
| The total estimated cost of attendance for a first year student is \$49,168. | |

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

Other Fees

| | |
|--|---------|
| Student health insurance fee | \$3,064 |
| Activities and recreation fee | 438 |
| Activities and recreation fee (summer) | 76 |
| Transcript fee (one time only) | 30 |
| Student Health Service fee | 65 |
| Verification fee (first year only) | 100 |

Payment of Tuition and Fees

Fall semester tuition, fees, and other university charges are due and payable by 17 August. Spring semester tuition, fees, and other university charges are due and payable by 3 January. Summer charges are due and payable by 30 June.

Additional information can be found at www.vanderbilt.edu/stuacct.

Refund of Tuition

Students who withdraw officially or who are dismissed from the university for any reason after the beginning of a term may be entitled to a partial refund in accordance with the schedule shown below. No refund will be made after the tenth week in any semester.

| Withdrawal prior to the end of | Reduction |
|--------------------------------|-----------|
| 1st full week | 100% |
| 2nd full week | 90% |
| 3rd full week | 85% |
| 4th full week | 80% |
| 5th full week | 75% |
| 6th full week | 65% |
| 7th full week | 60% |
| 8th full week | 50% |
| 9th full week | 45% |
| 10th full week | 40% |

No refund after the 10th full week.

Late Payment of Fees

Charges not paid by 17 August will be automatically deferred, and the student's account will be assessed a monthly late payment fee at the following rate: \$1.50 on each \$100 that remains unpaid after 17 August (\$5 minimum). An additional monthly late payment fee will be assessed unless payment is received in full on or before the end of each month, and late payment fees will continue for each month thereafter based on the outstanding balance unpaid as of the end of each month. All amounts deferred are due not later than 1 November for fall semester and 1 April for spring semester. Graduating students are not allowed to defer charges that are billed in advance for the final semester.

Financial Clearance

Students may not be allowed to register for any semester if they have outstanding unpaid balances for any previous semester. No transcript, official or unofficial, will be issued for a student who has an outstanding balance until the account has been paid. Diplomas of graduating students may be withheld until all bills are paid.

International students must provide documentation of having funds sufficient to meet all tuition, mandatory fees, and living expenses for the anticipated period of enrollment before a visa will be issued. Information will be provided by the university Office of International Student and Scholar Services.

Financial Assistance

Approved educational expenses are met with funds from a combination of sources. Government loans that furnish significant loans to students are the Federal Direct Unsubsidized Loan and Federal Direct Graduate PLUS loans. Private loans are also available to international students. Additional information and applications for financial aid are online at medschool.vanderbilt.edu/financial-services/. Applicants

desiring more specific information about financial aid resources should contact the Medical School Office of Student Financial Services.

Financial Information for Allied Health Programs

Cardiovascular Perfusion Technology

Tuition for the 22-month course is \$34,000, with \$8,500 due in August of the year entering. Three additional payments of \$8,500 are spread throughout the program. A \$100 non-refundable deposit fee—due no later than 3 days after signing the enrollment agreement—is required at the time of program acceptance. Housing costs, transportation, and living expenses are the responsibility of the student. The estimated cost for books and supplies is \$1,400.

Diagnostic Medical Sonography

Tuition for the full curriculum is \$12,500. Tuition includes all books. Housing costs, transportation, and living expenses are the responsibility of the student.

Dietetic Internship Program

Tuition cost for the 2016/17 year is \$10,000. A \$5,000 installment is due when the program begins in August, and the remaining \$5,000 is due in January. A monthly stipend of \$90 is furnished to each dietetic intern. Housing costs, transportation, and living expenses are covered by the student. The following annual program fees apply:

| | |
|----------------------------------|---------------------|
| Supply Fee | \$600 |
| Deposit Fee | \$250 |
| Wellcoaches Class | \$1,045 |
| Background Check | \$100 (approximate) |
| Professional Liability Insurance | \$200 |
| Registration Exam Review Course | \$400 |
| Books and Supplies | \$375 |

Optional Expense: The Academy of Nutrition and Dietetics annual Food and Nutrition Expo (FNCE): Attendance at FNCE is optional and not a requirement of the internship. The estimated cost of attending the 2016 FNCE in Boston, Mass., is \$1,200 which covers registration, transportation, and meals.

Neurodiagnostic Technology

Total tuition cost for the 18-month program is \$5,000. At the time of acceptance into the program, a \$1,000 non-refundable deposit is due (this amount applies toward the cost of tuition). The remaining \$4,000 is due by the first day of classes by check or money order payable to Vanderbilt University and given to the program director. Tuition includes:

- Courses (ASET courses, including texts)
- Lab fees

Additional Allied Health Program Fees and Requirements

All enrolling students must submit to a background check. The cost of this background check is the responsibility of the student and will be required at the time of acceptance into the school. In addition, all parking on the Vanderbilt University campus must be registered through VU Parking Services and requires monthly or annual payments. Parking rates will vary according to availability and student preference.

All other expenses related to attending the program are the responsibility of the student and include, but are not limited to, the following:

- Health insurance
- CPR certification
- Immunizations
- Uniforms
- Travel to and from clinical assignments
- Meals

Health Insurance

All Allied Health Program students are required to be covered by health insurance during their training. Students may seek out private health care insurance options or enroll via a government health care exchange.

Immunization and Health Records

Upon acceptance, students must provide written documentation of the following:

- Two (2) negative TB skin tests within the past twelve (12) months with the most recent being within the past three (3) months. If history of a positive skin test is present, a chest x-ray within the past six (6) months will be necessary.
- If born on or after January 1, 1957: Two (2) live measles vaccinations after the first birthday at least one month apart OR MMR vaccination since 1989 OR laboratory evidence of immunity to rubeola.
- Laboratory evidence of MMR vaccination or immunity to rubella.
- Laboratory evidence of MMR vaccination or immunity to mumps.
- Laboratory evidence of immunity to varicella (chickenpox) or immunization series.
- Hepatitis B immunization (series of 3 injections), immunization series in progress or informed refusal of immunization.
- Tetanus/diphtheria booster within the past 10 years is recommended, but not required.
- Students will be required to submit an annual physical.

Courses of Study

The School of Medicine offers the following degree programs: Doctor of Medicine, Doctor of Audiology, Doctor of Medical Physics, Master of Education of the Deaf, Master of Science (Speech-Language Pathology), Master of Science in Medical Physics, Master of Science in Clinical Investigation, Master of Laboratory Investigation, Master of Public Health, and Master of Science in Applied Clinical Informatics. Courses in the School of Medicine are offered in both semester and year-long formats. Courses leading to the M.D. do not carry credit hours; other programs use the traditional credit hour designation.

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.

Courses leading to the Doctor of Medicine*

*Glossary of Terms available at <http://vanderbi.lt/mdcourseglossary>

Anesthesiology

ANES 5310. Basic Clinical Anesthesiology. Students will become an integral part of an anesthesia care team model (attending anesthesiologist and resident) at VUMC. Working side-by-side with this care team, students will learn and actively participate in the perioperative management of adult patients presenting for surgical procedures and diagnostic or therapeutic interventions requiring anesthetic care and management. Students will participate in preoperative assessment, risk stratification, development and execution of anesthetic plan (including induction of anesthesia, airway management, maintenance of anesthesia, and emergence), and immediate postoperative care of patients. This rotation will provide a hands-on, continually monitored and mentored experience. At the conclusion of this two-week elective rotation, students will be able to take and perform a focused anesthesia history and physical, evaluate airway anatomy for ease or difficulty of airway management, and demonstrate valuable skills of mask/bag ventilation, intubation, and LMA placement. Additionally, through designated lectures, assigned textbook, selected journal readings, and hands-on clinical experiences, students will be acquainted with the pharmacology and physiology of anesthetic induction and maintenance agents, neuromuscular blocking drugs, vasoactive substances, local anesthetics, and opioid and non-opioid analgesics. Students will assess and interpret physiologic data from both non-invasive and invasive monitors and explain implementation of interventions to correct physiologic and hemodynamic perturbations.

ANES 5315. Perioperative Neurosciences: The Brains of the Operation. The overall goal of this elective is to have students apply their knowledge of anatomy, physiology, and pharmacology to the presentation and management of common neurological disorders. The students will have dedicated orientation and didactic sessions to review their experience and knowledge. Each will have a set of self-study exercises which will be reviewed with their dedicated mentor. Students will participate as active team members in several settings including the neuro care unit (NCU) and in the operating rooms with the neuro anesthesia and surgical teams. At the end of the two-week rotation, the students will demonstrate a focused history and physical exam of a neurological patient. They will be able to state the pathophysiology of the most common presenting neurological conditions such as raised intracranial pressure, seizures, or strokes including common methods of diagnosis. They will be able to present the patient and, based on their knowledge of CNS physiology, formulate a basic plan for medical or surgical management. In addition, students will understand how the care of these patients (nursing, monitoring, and pharmacology) differs from other medical conditions and the role of each specialty in the care of these patients.

ANES 5610. ACE: Perioperative Medicine and Surgical Home. This course is designed to emphasize the concepts of coordinated perioperative medicine and enhanced recovery after surgery (ERAS). Evidence-based guidelines, optimization/standardization of perioperative care, and

multimodal strategies to decrease postoperative morbidities are key components of ERAS. The student will function as integral part of the Perioperative Anesthesia Consult Service and learn fundamental aspects of anesthetic care that maximize perioperative pain control and reduce morbidity and health care costs related to cardiac, pulmonary, renal, endocrine, PONV complications or surgical site infections. The student will have an opportunity to be involved in the preoperative, intraoperative, and postoperative management of surgical patients on ERAS pathways.

ANES 5611. ACE: Advanced Clinical Anesthesiology. This ACE will define the role of anesthesiology as a perioperative medicine specialty in which students will gain broad understanding of the perioperative management of patients across all age groups undergoing surgical procedures. Course content will emphasize the following principles: preoperative assessment, development and execution of an anesthetic plan (including induction of anesthesia, airway management, maintenance of anesthesia, and emergence), and management of acute pain. Students will become an integral part of an anesthesia care team model (attending anesthesiologist and resident). Working side-by-side with this care team, students will learn and actively participate in the anesthetic management of patients presenting for surgical procedures and diagnostic or therapeutic interventions.

ANES 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

ANES 7100. AWAY ACE: Anesthesiology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

ANES 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Emergency Medicine

EM 5315. Emergency Medicine Elective. This elective will provide a two-week snapshot into the approach to any event or circumstance that threatens loss of life, injury to person or property, or human suffering. Students will be introduced to critical situations in the actual emergency department while learning the important skills required for patient stabilization and assessment. At the conclusion of the elective, students will understand and gain comfort in their future roles as physicians in any emergency situation in or out of the hospital setting. They will understand emergency care while extrapolating their current beliefs regarding emergency care to situations in the hospital setting and in the surrounding community. Students will apply problem-based strategies and teamwork to patient care, using the introductory principles in emergency medicine. They will practice an evidence-based approach and engage in teamwork to enhance their knowledge and skills in treating victims of cardiopulmonary and traumatic emergencies.

EM 5325. Bedside Ultrasonography in the Emergency Medicine Department. Students will be introduced to point-of-care ultrasonography with specific emphasis on its use in the acute care setting. Students will learn about sonography both through web-based resources and videos as well as during weekly didactic sessions. In addition, students will spend several shifts in the Emergency Department each week both observing and performing point-of-care sonography under the guidance of the Director and Assistant Director of Emergency Ultrasound, Emergency Ultrasound Fellows, and Emergency Medicine residents. At the conclusion of the two-week elective rotation, students will be able to describe the appropriate use and application of point-of-care sonography in multiple clinical scenarios. They will be able to recognize normal and pathologic ultrasound images of several core applications. They will acquire the necessary technical skills to operate the ultrasound machine and to obtain images for several important studies including FAST (Focused Assessment with Sonography in Trauma), cardiac, abdominal aorta, renal, and soft tissue.

EM 5950. ACE: Emergency Medicine. “Is there a doctor on the plane?” Emergencies happen in all specialties and even in life. The four-week Emergency Medicine course will introduce the student to emergency medicine and the initial management strategies for common life-threatening emergencies. Students will develop an approach to common undifferentiated patient complaints and a practical skill set in: acid-base emergencies, basic airway management, electrocardiogram interpretation, and electrolyte emergencies. Students will also complete Basic Life Support (BLs) and Advanced Cardiac Life Support (ACLS) training. During the week, there are daily didactic sessions as well as procedure labs and high fidelity simulations. Clinical shifts are spread across a variety of practice settings (adult and pediatrics) and offer a broad exposure. Students work closely with emergency medicine faculty and residents to identify sick patients and develop differential diagnoses and management plans. Students also have the opportunity to participate in procedures and trauma resuscitations. Fulfills the acute care course requirement.

EM 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

EM 7100. AWAY ACE: Emergency Medicine. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

EM 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Interdisciplinary Studies

IDIS 5001. CASE—Clinical Application of Scientific Evidence. The research curriculum is a four-year thread. Students will be introduced to a career as a physician-researcher and receive training and hands-on experience in several critical areas of importance to success in research. This will be accomplished through a series of didactic lectures focused on introduction to important skills and traits of physician-researchers, shadowing and interviewing physician-researchers and processing the information to tell a story through a film documentary and related curriculum. First year.

IDIS 5002. Discovery. Students will engage in activities which further develop understanding of research process while supporting exploration of research opportunities that may be pursued during the Immersion phase. The course begins with an overview of general research areas in which students can participate. Additional course meetings include topics related to mentoring, ethics and professionalism, regulatory training, and scientific communication.

IDIS 5015. Interprofessional Continuity Clinic 1: Vanderbilt Program in Interprofessional Learning (VPIL). The Vanderbilt Program in Interprofessional Learning (VPIL) is a longitudinal continuity clinic experience where students work and learn together as members of an interprofessional team. This is the first year of a two-year experience. Medical students accepted into the program are assigned to teams of health professions students earning degrees in advanced practice nursing, pharmacy and social work. The teams work alongside their assigned clinical preceptors in order to deeply understand the many factors—biological, social, psychological, economic and cultural—that impact patient health and wellbeing, as well as system factors that impact how our health care teams and clinics function on a daily basis. The program launches with a week-long summer immersion. Throughout the academic year, student teams work and learn together in clinics, seminars and simulated learning activities. Program goals include: cultivate respectful professionals, nurture self-directed workplace learners, prepare leaders who contribute to a collaborative-practice-ready workforce, integrate the patient care experience with health professions knowledge, and improve the health care delivery system by integrating systems knowledge with patient care. Participation in VPIL allows for medical students to waive credit in specified areas of Foundations of Health Care Delivery (FHD). Specific graduation requirements can be found at <https://medschool.vanderbilt.edu/vpil/>

IDIS 5016. Interprofessional Continuity Clinic 2: Vanderbilt Program in Interprofessional Learning (VPIL). The Vanderbilt Program in Interprofessional Learning (VPIL) is a longitudinal continuity clinic experience where students work and learn together as members of an interprofessional team. This is the second year of a two-year experience. Medical students accepted into the program are assigned to teams of health professions students earning degrees in advanced practice nursing, pharmacy and social work. The teams work alongside their assigned clinical preceptors in order to deeply understand the many factors—biological, social, psychological, economic and cultural—that impact patient health and well-being, as well as system factors that impact how our health care teams and clinics function on a daily basis. Throughout the academic year, student teams work and learn together in clinics, seminars and implement a quality improvement project. They will present their project as part of a Capstone event that completes the program. Program goals include: cultivate respectful professionals, nurture self-directed workplace learners, prepare leaders who contribute to a collaborative-practice-ready workforce, integrate the patient care experience with health professions knowledge, and improve the health care delivery system by integrating systems knowledge with patient care. Participation in VPIL allows for medical students to waive credit in specified areas of Foundations of Health Care Delivery (FHD). Specific graduation requirements can be found at <https://medschool.vanderbilt.edu/vpil/>

IDIS 5028. Human Blueprint and Architecture. This course is designed to familiarize students with the structures, biomolecules, and processes that constitute life, human health, and disease at the molecular, cellular, and tissue level. Course materials will provide a mechanistic foundation for the medical curriculum that will help equip students with skills necessary to adapt to the practice of medicine in the future. Human Blueprint and Architecture will employ a coordinated and integrated approach to teaching underlying principles of biochemistry, cell and tissue biology, genetics, and pathology with an emphasis on medical conditions. Students also will be introduced to basic principles of anatomy and pharmacology in order to lay foundations for studies on organ systems and disease treatment. In order to provide a broad range of materials and relate molecular and cellular processes to the study of human disease, the course will utilize multiple learning modalities, including large group sessions, case-based learning (CBL) sessions, team-based learning (TBL) sessions, laboratory sessions, and interactive patient-oriented clinical case presentations. The course will be integrated with all other learning activities in the Foundations of Medical Knowledge phase. Required. First year.

IDIS 5032. Microbes and Immunity. This course familiarizes students with the etiology, risk factors, epidemiology, diagnosis, pathogenesis, clinical characteristics, prevention and treatment of common microbial and immune diseases. The course content includes a discussion of the soluble factors and cells that make up the immune system and how these different components contribute to health and disease in a variety of situations. It also provides an overview of the pathogenic bacteria, viruses, fungi, protozoa and parasites. Finally, the course includes several topics that prepare students for the Homeostasis class of the Foundations in Medical Knowledge phase. The course consists of lectures, case-based small group discussions, case-based intermediate size group discussions, laboratory sessions, and optional problem and review sessions. Required. First year.

IDIS 5033. Learning Communities—Foundations of Medical Knowledge. The Learning Communities FMK course seeks to maximize medical student learning related to student development as professionals. Helping students build an appropriate image of the medical profession and skill set related to functioning within the health care environment are the essential foundation for future success. Development as professionals involves knowledge, skills and attitudes related to students' practice as well as the environment within which the practice will occur. The longitudinal nature and trusting environment created within the Learning Communities fosters student professional development, specifically addressing personal areas of metacognition and reasoning, ethics, service, and leadership, as well as the knowledge and understanding of the broader health care environment and payment. The academic sessions will be developmentally appropriate as the students mature through the phases, as well as effectively integrated with other course and clerkship efforts. In sum, the Learning Communities will provide the nurturing environs to maximize student development as professionals.

IDIS 5038. Homeostasis. This course is designed to teach students the normal anatomic, molecular, biochemical, and physiologic features of the cardiovascular, pulmonary, renal and blood systems. Course content will provide a framework for an understanding of the pathology and pathophysiology of diseases that affect these homeostatic systems as well as their diagnosis (laboratory and imaging), and therapy (pharmacologic and nonpharmacologic). A multidisciplinary approach will allow integration of pathobiology, clinical manifestations, and therapy in a comprehensive manner. The course will utilize a variety of teaching modalities that include case-based learning, team-based learning, lectures, laboratory sessions focused on the gross and microscopic anatomy and pathology, and technology-based modalities and simulations. Learning will be in the context of clinical medicine in order to prepare students for the next phase of their education in the clinical setting. The course will be integrated with all other learning activities in the Foundations of Medical Knowledge phase. Required. First year.

IDIS 5048. Foundations of Health Care Delivery 1: Continuity Clinical Experience. Foundations of Health Care Delivery 1: Continuity Clinical Experience is a longitudinal clinical experience where individual students are integrated into a clinic to learn about the clinical care team and clinic setting, and develop skills to care for individual patients while learning about the larger care-delivery system. Course activities including clinical experiences and seminars will address the following goals: (1) prepare professionals with systems-level skills necessary to provide care that is safe, effective, patient-centered, timely, efficient, and equitable; (2) integrate health systems sciences with clinical care; (3) cultivate respectful professionals.

IDIS 5055. Foundations of the Profession. The goal of this course is to provide students with an understanding of the historical and social context of the practice of medicine. Through assigned readings, lectures, small group discussions and simulations, students will gain an appreciation for the core values and ethical principles that guide the profession's relationship with society and the physician's relationships with patients. They will also explore some of the contemporary challenges facing physicians today, including the need to improve health care disparities, quality, and safety. First year.

IDIS 5058. Endocrine, Digestion, and Reproduction. This course is designed to familiarize students with the normal anatomic, molecular, biochemical, and physiologic features of the endocrine, digestive and reproductive systems. Course content will provide a framework for an understanding of the pathology and pathophysiology of diseases that affect these systems as well as their diagnosis (laboratory and imaging) and therapy (pharmacologic and nonpharmacologic). The role of nutrition in normal homeostasis as well as disease will be included. Pregnancy from implantation to delivery as well as its complications will also be learned. A multidisciplinary approach will allow integration of pathobiology, clinical manifestations, and therapy in a comprehensive manner. The course will utilize a variety of teaching modalities that include case-based learning, team-based learning, patient interviews, lectures, laboratory sessions focused on the gross and microscopic anatomy and pathology, and technology-based modalities and simulations. Clinical context will be emphasized in order to prepare students for the next phase of their education in the clinical setting. The course will be integrated with all other learning activities in the Foundations of Medical Knowledge phase. Required. First year.

IDIS 5068. Brain, Behavior, and Movement. The Brain, Behavior, and Movement module provides an overview of contemporary neuroscience and introduction to neuropsychiatric disorders. The format of the module includes lectures, lab exercises, small group discussions, and case presentations and discussions. In conjunction with Physical Diagnosis, skills training includes the psychiatric interview and neurological exam. The module emphasizes a basic understanding of the anatomy, physiology, and pharmacology of the central and peripheral nervous systems and the pathophysiological underpinnings of neuropsychiatric disorders. The course provides the foundations of neurology and psychiatry. This course is a module within the Foundations of Medical Knowledge phase. Required. First year.

IDIS 5100. ACE: Primary Care Medicine, VU. All immersion phase students will have a required four-week unit in an ambulatory primary care setting, and this course fulfills that requirement. Students will choose an

experience in outpatient pediatrics, internal medicine, family medicine, or internal medicine/pediatrics. Practice sites include ambulatory clinics at Vanderbilt or within the Nashville-area community. The clinic experience is supplemented by a home visit to follow-up on a patient seen during the ambulatory clinic experience. Assistance with placement is provided.

IDIS 5150. AWAY ACE: Primary Care Medicine. All immersion phase students will have a required four-week unit in an ambulatory primary care setting, and this course fulfills that requirement. Students will choose an experience in outpatient pediatrics, internal medicine, family medicine, or internal medicine/pediatrics. Practice sites include ambulatory medicine or pediatric clinics. Students may arrange a primary care experience outside of Nashville, subject to the approval of the course directors. The clinic experience is supplemented by a home visit to follow-up on a patient seen during the ambulatory clinic experience. Assistance with placement is not provided, and students are also responsible for insuring that proper affiliation agreements are in place for this rotation.

IDIS 5200. MSTP Seminar Series. This elective is open to students in the Medical Scientist Training Program only.

IDIS 5201. Foundations of Biomedical Research I. The major goals of this course for MSTP students in their first year of medical school are to help them to gain familiarity in reading primary research literature, including utilization of statistical analyses, and to aid the students in selection of a thesis mentor and in understanding of appropriate expectations for both mentor and mentee. These goals will be accomplished in a casual setting through interactions with potential MSTP-eligible faculty and lab members, consultation with faculty advisors, and primary literature discussions. Students will be assessed based upon course participation. Open to students in the Medical Scientist Training Program only. First year.

IDIS 5202. Foundations of Medical Research II. The purpose of this course is to prepare MSTP students for the biomedical research phase of training. The course objective is to develop skills for physician-scientist trainees in critical evaluation of the research literature and formulating high-impact research questions. For second year students the course will be tailored to the individual interests of the students and their research mentors, with particular emphasis on examining scientific papers specific to the students' field of research. Open to students in the Medical Scientist Training Program only. Second year.

IDIS 5215. Foundations of Health Care Delivery 2: Clinical Systems of Care. Foundations of Health Care Delivery 2: Clinical Systems of Care is a course designed to introduce students to the larger health care systems. Students will engage in didactics and experiential learning to develop a deeper understanding of the systems involved in practicing within a mesosystem and macrosystem. Students will learn about social determinants of health and community advocacy, experience a variety of settings of care, learn about safe transitions of care, and optimizing health care value. Through these experiences, students will address the following goals: (1) prepare professionals with systems-level skills necessary to provide care that is safe, effective, patient-centered, timely, efficient, and equitable; (2) integrate health systems sciences with clinical care; (3) cultivate respectful professionals.

IDIS 5220. PLAN. This course introduces students to the basic concepts and principles of research and their application to clinical practice and population health in preparation for their Research Immersion. The course provides the necessary research skills and competencies to develop a basic but complete and structured research proposal for the upcoming Research Immersion experience.

IDIS 5233. Learning Communities—Foundations of Clinical Care. The Learning Communities FCC course integrates with the student's clerkship experiences and builds on the students' experiences Learning Communities FMK. Prior efforts addressed important professional development topics such as metacognition, clinical reasoning, ethics, leadership, and health care delivery. The Learning Communities FCC course connects these theoretical concepts and discussions with the practical and experiential learning of the students during their clerkship rotations. Students meet in College-based groups for discussion and reflection with the College Mentors, as well as in clerkship-based groups with ethics faculty for deeper exploration of ethical issues specific to each clerkship. In sum, the

Learning Communities FCC course will continue to provide nurturing environments to enhance student development as professionals by allowing for the exploration of the practical application of previously learned concepts.

IDIS 5310. CiM Multi-Specialty Elective. Throughout this two-week elective, students will shadow attending and resident physicians of their choosing in various specialties and subspecialties. The purpose of the course is to introduce students to various fields of medicine in an effort to aid in their specialty selection in the fourth year of medical school. A list of attending physicians in various specialties will be provided by the Student Representatives of Careers in Medicine (CiM). Enrolled students will be responsible for contacting physicians and scheduling their shadowing experiences over the two-week period. Two weeks prior to the beginning of the elective, a meeting with the course director(s) will outline the process for scheduling these experiences and expectations for the elective. Shadowing experiences with faculty members outside the CiM-provided list may be arranged with prior approval from the course director. At the end of the elective, students will participate in a professional development workshop and an individual exit counseling session with the Assoc. Dean for Medical Student Affairs to discuss their clinical experiences and their progress towards choosing a specialty. Students will schedule shadowing experiences for nine days of the elective and attend the professional development workshop and the exit counseling session. Shadowing of one physician is limited to a maximum of three days. Enrolled students will submit their shadowing schedule to the course director(s) prior to the start of the elective for approval. The professional development workshop will address topics such as CV writing and public speaking. At the conclusion of the two-week rotation, students will be familiar with the schedules, daily activities, patient populations, and consultations in several specialties. The shadowing experience and exit counseling session with the associate dean for medical student affairs will provide students with information that will aid their specialty selection and CV.

IDIS 5314. Critical Thinking and Logic in Medicine. Critical Thinking, logic and reasoning play a fundamental role in everyday patient care as well as research design, interpretation and application. While development and application of evidence based medicine is crucial to advancement of all aspects of clinical practices, it is of little significance without sound critical thinking and logic reasoning. Students will join anesthesiologists and/or intensivists in the operating rooms and ICU from 7:30 to 12:00 every other day throughout the elective period. Didactics about the principals of critical thinking in medical practice and other similar high intensity environments will be offered in form of lectures, discussion groups and simulations. Pre acquired knowledge in the field of anesthesia and critical care is not required. Problem solving skills development will be based on concept of critical thinking and asking the right questions. Resources to acquire needed knowledge to apply in problem solving will be provided to students and will consist mainly electronic resources available on the internet and intranet followed by physicians practicing in the respective fields. At the conclusion of the two-week elective rotation, students will be able describe and apply principals of critical thinking and reasoning to patient care. Application of logic and reasoning to individual patient care as well as generating the relevant hypothesis on which future literature search and study design should answer. While problems in anesthesiology and critical care will serve as examples, the understanding, concepts and resources will be generalizable to all fields of medicine. Objective pre and -post-course evaluation will given to track learning and help in improving the course for future students. A subjective evaluation will also be collected from each student. Students will receive feedback at the end of each clinical exposure (2 days) on the elective and at the conclusion of the post-course evaluation. The course will be graded on a pass/fail basis. Students should report to MCE 3161 on their first day.

IDIS 5316. Medicine and Media. As the interest in science and medical news grows and more media outlets exist to report and analyze such news, the need will increase for medical professionals who are skillful at using media of all types to convey information. An understanding of various facets of how science and medical news are produced and reach the public may be gained through working with Vanderbilt communications professionals engaged in reaching the public with such news. Students in this elective will join various units of Vanderbilt's communications team, both as observers and participants, in order to learn some of the fundamentals of medical

and health communications at a major academic medical center. These opportunities will include, but not be limited to, local and national media relations; getting hands-on experience with medical journalism by researching and writing a press release or a story for the *VUMC Reporter* or other Medical Center publications; working with the social media team to learn about the uses of media such as Facebook and Twitter to convey news, as well as health and wellness information; working with the division's web team to learn about the presentation of news and information via the web; receiving a more institution-wide perspective by working with the editors of *Research@Vanderbilt*, our website devoted to research news; and working with VUMC faculty who are frequently called on by the press to convey health information to the public. The students will also be assigned readings and viewings that provide context to the daily hands-on experience. At the conclusion of the two-week elective, students will be able to interview one or more sources and write a publishable news story on biomedical research or a health topic; understand the daily interactions between the local and national media and a medical center such as Vanderbilt that seek to influence both public health and its national reputation via media relations; and understand the key role of social media in the modern media environment. Students will also have the opportunity to become more skilled at being interviewed and accurately conveying information, even in a challenging environment. Additionally, the students will have an understanding of some of the key differences in professional assumptions between media professionals and science professionals.

IDIS 5327. Adult Communication Disorders. This two-week elective will offer students an opportunity to focus on adult communication disorders. Students will be provided didactic coursework in the relevant areas and will observe and, when appropriate, participate in surgical, medical, and clinical care of affected patients. Students will join an interdisciplinary team of clinicians, scientists, and physicians to serve and investigate adult patients who exhibit acquired communication or vestibular disorders as a result of damage to the central or peripheral nervous system. Acquired neurogenic disorders commonly are associated with stroke, dementia, Parkinson's disease, Lou Gehrig's disease, tumor, and traumatic brain injury, which result in aphasia, dysarthria, and apraxia of speech. The most commonly diagnosed vestibular disorders include benign paroxysmal positional vertigo (BPPV), labyrinthitis or vestibular neuritis, Meniere's disease, secondary endolymphatic hydrops, and perilymph fistula, which result in a range of difficulties including vestibular disturbance and difficulties with balance and falls. Students will spend a portion of their time with the Neurogenics Team and a portion of their time with the Vestibular Team. Care providers from the departments of Hearing and Speech Sciences, Neurology, Physical Medicine and Rehabilitation, Trauma, and Otolaryngology will participate in this elective.

IDIS 5329. Pediatric Communication Disorders. This two-week elective will offer students an opportunity to focus on pediatric communication disorders. Students will be provided didactic coursework in the relevant areas and will observe and, when appropriate, participate in surgical, medical, and clinical care of affected patients. Students will join an interdisciplinary team to serve and investigate pediatric patients who exhibit hearing loss, dysphagia (a feeding and swallowing disorder), or Autism Spectrum Disorder (ASD). ASD includes Autism and Pervasive Developmental Disorder—not otherwise specified and is characterized by a disturbance of normal neural organization and connection resulting in impaired social interaction and communication. Students will spend a portion of their time with the cochlear implant and hearing aid teams, a portion of their time with the dysphagia team, and a portion of their time with the ASD team. The Hearing Loss Team will consist of audiologists, surgeons, speech-language pathologists, and a number of other individuals who work with these children. Clinical and surgical observations will take place in various clinics within the Bill Wilkerson Center and in the Otolaryngology Clinic at Children's Hospital. The Dysphagia Team will consist of otolaryngologists and speech-language pathologists, and a number of other professionals who work with these children. Clinical and surgical observations will occur within the Complex Aerodigestive Evaluation Team (CADET) Clinic. The ASD Team will consist of care providers and scientists from the departments of Psychiatry, Psychology, Developmental Pediatrics, Hearing and Speech Sciences, Neuroscience, and a number of other individuals working with these children.

IDIS 5330. Critical Thinking and Logic in Medicine. Critical Thinking, logic and reasoning play a fundamental role in everyday patient care as well as research design, interpretation and application. While development and application of evidence based medicine is crucial to advancement of all aspects of clinical practices, it is of little significance without sound critical thinking and logic reasoning. Students will join anesthesiologists and/or Intensivists in the operating rooms and ICU from 7:30 to 12:00 every other day throughout the elective period. Didactics about the principals of critical thinking in medical practice and other similar high intensity environments will be offered in form of lectures, discussion groups and simulations. Pre-acquired knowledge in the field of anesthesia and critical care is *not* required. Problem solving skills development will be based on concept of critical thinking and asking the right questions. Resources to acquire needed knowledge to apply in problem solving will be provided to students and will consist mainly electronic resources available on the internet and intranet followed by physicians practicing in the respective fields. At the conclusion of the two-week elective rotation, students will be able describe and apply principals of critical thinking and reasoning to patient care. Application of logic and reasoning to individual patient care as well as generating the relevant hypothesis on which future literature search and study design should answer. While problems in anesthesiology and critical care will serve as examples, the understanding, concepts and resources will be generalizable to all fields of medicine Objective pre and post course evaluation will be given to track learning and help in improving the course for future students. A subjective evaluation will also be collected from each student. Students will receive feedback at the end of each clinical exposure (2 days) on the elective and at the conclusion of the post-course evaluation. The course will be graded on a pass/fail basis. Students should report to MCE 3161 on the first day. [0]

IDIS 5500. USMLE Step 1 Independent Study. This course requires students to undertake a two-month period of independent study for Step 1 of the United States Medical Licensing Exam. This course is required prior to advancing into Immersion phase requirements.

IDIS 5610. AE: Med School 101.

IDIS 5613. ISC: Critical Illness. Regardless of a student's individual specialty choice, each will be called upon to provide competent care for critically ill patients during their residency training. The successful management of critically ill or injured patients requires a thorough understanding of physiology, pathophysiology, and pharmacology. By combining targeted teaching with hands-on experiences in different ICUs across the medical center, Critical Illness will deepen knowledge of the anatomy, physiology, pathophysiology, imaging, biostatistics, ethics, microbiology, neuroscience, nutrition science, pharmacology, and behavioral medicine inherent in critically ill patients. In the first week, all students will be immersed in Critical Care Skills Week, a highly regarded simulation-based learning experience that culminates in receipt of Fundamentals of Critical Care Support (FCCS) certification. All students will spend a week caring for patients in the Medical, Surgical, Burn, Neurologic, Cardiovascular, or Pediatric ICU. The other two weeks will be spent in learner-focused case-based education facilitated by ICU faculty, ICU radiology and palliative care sessions, additional patient-centered experiential learning opportunities and hands-on workshops in ICU-specific technical skills such as airway management, ventilator manipulation, and chest tube placement. Fulfills the acute care course requirement.

IDIS 5614. ISC: Community Health Care—Patients, Populations and Systems of Care. In Community Health Care, students will be equipped to effectively address predictors of poor health on an individual level, and to engage health care systems in ways that promote meaningful change. Students will move beyond an investigation of the social determinants of health to provide individualized patient care and engage the health care system. Regardless of the field students decide to enter, they will encounter vulnerable populations of patients and should be equipped to address patient needs in ways that promote healing. Foundational science topics will include population health, health policy, health determinants, community engagement, systems engineering, public health, organizational management, health ethics, resource utilization, implementation science, behavioral science, and communication science. The course is comprised of clinical experience in a safety net clinic, seminar sessions with local and national experts to facilitate skill development, and completion of a final

project. The course will equip students with a “portable toolkit” of skills that can be used in any field of practice in any location. This course qualifies for primary care credit.

IDIS 5618. ISC: Global Health. Health promotion, disease prevention and control, and mortality reduction require an interprofessional, multidisciplinary response for multidimensional problems. Whether from the point of view of humanitarian interest, research competitiveness, full utilization of our educational resources, or the need for global expertise for modern America, the global health agenda has emerged as an increasingly important component of higher education in the U.S. In this on-the-ground experience, students are placed at Vanderbilt partner sites in various locations around the world and are introduced to key topics and concepts in global health including diseases, root causes, and both clinical and public health interventions common in low-resource settings. Foundational science topics include Biostatistics, Epidemiology, Immunology, Microbiology, Neuroscience, Nutrition Science, Pathology and Pathophysiology, Pharmacology, Physiology, Social Sciences, Behavioral Science, and Health Systems. Health and developmental issues across nations and cultures that require collective (partnership-based) action are highlighted. The course is taught through digital modules, on-site exposures to patients, health systems, and communities, and distance mentoring sessions. All students complete a core of digital modules and assessments, plus modules that are site specific.

IDIS 5620. ISC: Clinical and Molecular-based Approaches to Cancer. Over the last decade there has been an increase in the understanding of the molecular drivers of cancers. Based on this information, gene mutation-specific inhibitors are being developed for clinical use that target only sub-populations of patients with particular tumor genotypes. As a result, there is a need for modern oncologists to have an appreciation of the fundamental molecular biology underlying the patient's tumor to effectively translate tumor genotype to personalized patient care. This course will provide a unique experience in oncology where medical and graduate students work together to explore the molecular drivers of cancer and how that information is translated into targeted cancer therapies. Foundational science topics will include anatomy, biochemistry, cell biology, genetics, histology, immunology, molecular biology, pathology, physiology, radiobiology, social sciences, and toxicology. Through seminars and literature review sessions, students will learn the risk factors for cancer and signaling pathways that are often deregulated in the disease. This information will be used as a platform to describe how molecular changes are detected in the laboratory and leveraged in the clinic for personalized patient care. Students will examine the multidisciplinary teams necessary for the care of cancer patients through participation in tumor board meetings, clinical experiences, and roundtable discussions. Furthermore, cancer screening, imaging, pre-clinical drug discovery, the advantages and barriers of clinical trials, and socioeconomic disparities will be presented in this course. Group projects will challenge students to integrate the information learned into diagnosis and treatment plans.

IDIS 5621. ISC: Cardiovascular Disease. The course will expose the student to a broad range of cardiovascular diseases, focusing on foundational science as well as clinical topics that are applicable to students going into any specialty in which they will care for patients with cardiovascular diseases. Foundational science topics will include cardiovascular physiology and hemodynamics, electrophysiology, anatomy, histology, and pharmacology. All students will participate in a core series of didactics and workshops, but will be allowed to choose clinical experiences in cardiology, cardiothoracic surgery, vascular surgery, and cardiothoracic anesthesia. Clinical care will occur in a variety of settings including the wards, intensive care unit, operating room, outpatient clinics, and diagnostic laboratories. The course will provide flexibility to allow the interested student to have experiences in at least two clinical specialties. In addition, the curriculum is designed to encourage teamwork and knowledge sharing through interactive conferences and work groups.

IDIS 5622. ISC: The Skinny on Obesity—What Every Physician Should Know. Rates of obesity are rising all around the world and physicians confront it daily regardless of specialty. Whether clinicians or surgeons, general practitioners or specialists, pediatricians or internists, we all face a need and an opportunity to offer effective prevention and care of obesity and its comorbidities. In this course, students will be exposed

to the evolution of this disease across these life stages, highlighting clear opportunities for prevention and treatment. They will have the opportunity to participate in a variety of multidisciplinary clinical and community settings, which range from general to subspecialty, and from medical to surgical. Through these clinical experiences and a core of didactics and discussions, students will learn key points of obesity, including prevention, treatment, and management of its comorbidities. Foundational science topics will include behavioral sciences, biochemistry, endocrinology, genetics, implementation science, neuroscience, nutrition sciences, pathology, pathophysiology, pharmacology, physiology, social sciences and system sciences. This course is designed to help students develop the unique knowledge, attitudes, skills, and behaviors needed to play an influential role in addressing this disease process.

IDIS 5623. ISC: Getting Hooked—Addiction. Addiction is a highly prevalent, chronic brain disease that affects nearly every organ system in the body. A leading cause of morbidity and mortality, addiction is preventable and treatable, but only about 10 percent of those affected receive appropriate treatment. Patients with problems related to addiction may present for care in any setting across the health care system. It is therefore essential for all physicians to be well versed in the basic principles of addiction medicine. This four-week course will be an opportunity to synthesize the neuroscience of addiction with clinical skills in assessment and treatment of addictive disorders. The primary goals of the course are to train future physicians: to recognize addiction as a chronic brain disorder; to effectively screen for substance use disorders in varied clinical settings; to treat or refer patients for specialized treatment as indicated; and to consistently approach patients with addiction with compassion and respect. In addition, this course serves as an opportunity to return to the foundational medical knowledge underlying the pathophysiology and treatment of addictive disorders and integrate this knowledge with clinical care. Key concepts of foundational medical knowledge will be reviewed including neuroanatomy, mechanisms of neurotransmission, pharmacology, epidemiology, and cell biology as they relate to addiction medicine. Students will use online modules and independent study for instruction on foundational medical knowledge and in-class time will be focused on discussion and integration of the material with clinical experience.

IDIS 5624. ISC: Diabetes Mellitus. Diabetes mellitus is a worldwide pandemic. One in twelve United States adults now suffers from the disease, and in the near future this number will likely increase to one in ten. Physicians in any specialty/subspecialty can expect to care for patients with diabetes, especially because patients with diabetes have higher rates of hospitalization, surgical complications, cardiovascular disease, infection and other morbidities. Therefore most, if not all, physicians in training should be competent in basic treatment of diabetes in the inpatient and outpatient settings and understand the current and future areas of research and medical practice as related to diabetes. This course is designed to teach our medical students how to care for the patient with diabetes mellitus, regardless of their specialty of choice, as well as to understand the basic science, social effects, bearing on public health, and human impact of this disease. Additionally, biomedical research in diabetes involves many fields of research such as cardiovascular disease, physiology, molecular biology, genetic medicine, cell biology, and neuroendocrinology. As a medical center whose goal is to train future researchers and leaders in medicine, Vanderbilt must offer experiences in diabetes patient care and research to its students. This immersion will include components of clinical training as well as an academic project exploring the limits of current scientific knowledge about diabetes care and treatment.

IDIS 5625. ISC: Immunity and Infections in the Immune-compromised Host. The care of patients with altered host defense is becoming increasingly complicated due to both the variety of immune-compromising therapeutic strategies and the continued spread of multi-drug resistant pathogens. To provide excellent patient care and develop new strategies in the care of immune-compromised patients, future physicians will require a solid background in basic immunology, an understanding of how both broad and targeted immune-based therapies increase infection risk, and knowledge in the diagnosis and treatment of complicated infections in these patients. In this course, immersion-phase medical students will revisit foundational immunologic concepts from the FMK curriculum in the clinical context of transplant immunology with special attention

given to understanding infectious complications of immunosuppression. The course will employ a variety of learning formats—including didactic lectures, case-based learning, team-based learning, journal clubs, and a group project—to fulfill learning objectives focused on understanding mechanistic immunology in clinically-relevant settings. Each student will spend the clinical portion of their month on a transplant (solid organ or hematopoietic) or infectious disease service while participating in focused learning activities described above. Foundational science topics will include microbiology, immunology, molecular biology, pathology, pathophysiology, and pharmacology.

IDIS 5626. ISC: Medical Imaging and Anatomy. Imaging is an essential component of the diagnosis and treatment of disease across all fields of medicine. Every physician interacts with medical imaging both in emergent and non-emergent settings. Therefore, each student requires knowledge of the utility, indications, acquisition, interpretation, limitations, and risks of medical imaging. Furthermore, it is crucial that physicians understand how imaging affects patient care and management and how it fits into the larger health care delivery system. This course will strengthen and expand upon prior learning in anatomy, embryology, pathophysiology, neuroscience, and pathology and introduce students to radiobiology and radiation effects, imaging physics, imaging ethics, radiologic pharmacology, and biostatistics. The course will consist of a two week “general” portion for all students and a two week “selective” portion in one of the following: neurologic imaging, cardiothoracic imaging, body imaging, or musculoskeletal imaging (limited space for each selective). Self-paced didactic podcasts and case series as well as live lectures, small group discussions, and student presentations will accompany clinical exposure to medical imaging in diagnostic, interventional, therapeutic, and operative settings. Additionally, students will participate in anatomy and pathology labs and will learn and be evaluated in basic ultrasound scanning technique. After this course, students will feel confident with key anatomy, be able to make several “do-not-miss” imaging diagnoses, and will be able to use imaging more safely and appropriately.

IDIS 5627. ISC: Injury, Repair, and Rehabilitation. In the US, injuries are the leading cause of death among persons ages 1–44 years of age and result in more deaths than non-communicable diseases and infectious diseases combined. In this course, students will be exposed to the continuum of injury, repair, regeneration, and rehabilitation through the multidisciplinary viewpoints of emergency medicine, trauma surgery and associated surgical subspecialties, such as anesthesia, hematology & transfusion medicine, physical & occupational therapy and speech-language pathology. Students will spend portions of their clinical experience on the trauma service supplemented by rotations through rehabilitative, recovery, and palliation settings. Didactics will focus on shock, hemostasis and thrombosis, wound healing and regeneration of skin, bone and nerves, nutrition, acute and chronic pain management, speech-language pathology, age and co-morbid factors, brain injury, case-based learning across the continuum from acute to long-term recovery, as well as palliative care and death. Integrated foundational sciences are anatomy, epidemiology, ethics, immunology, implementation science, neuroscience, nutrition sciences, pathology, pathophysiology, pharmacology, radiobiology, social sciences, system sciences. Following experiential anatomic learning and practice, successful students will obtain four-year American College of Surgeons Advanced Trauma Life Support (ATLS) certification (except in section 6, when students will audit the ATLS course but not receive certification), as well as audit the Advanced Surgical Skills Exposure for Trauma (ASSET); both courses are coordinated using the facilities of the Program for Advanced Anatomy and Simulated Skills (PASS) and the Center for Experiential Learning and Assessment (CELA). This course will serve as a prerequisite to the Advanced Clinical Experience in Trauma.

IDIS 5628. ISC: Infectious Diseases. A WHO report warns that infectious diseases are spreading more rapidly than ever before and that new infectious diseases are being discovered at a higher rate than at any time in history. This elective is for students with an interest in learning more about how to diagnose and treat patients with infectious disease. Students will also learn how to use antibiotics appropriately and manage the complications of HIV and other chronic infections. The diversity of patient population will afford the student a breadth of experience in evaluating and managing patients with infectious diseases. In this clinic-driven experience, students are placed in a series of 3 week-long clinical

experiences in various settings including inpatient, outpatient and laboratory medicine and are introduced to key topics and concepts in infectious diseases including symptoms, diagnosis, treatment, vaccines, and antibiotic stewardship. Methods to establish an etiologic diagnosis and rational use of antibiotics are emphasized. Foundational science topics include epidemiology, immunology, microbiology, virology, pathology and pathophysiology. The course is taught through online modules/lectures, clinic exposures to patients, team-based learning, and case presentations.

IDIS 5629. ISC: Sexual Medicine and Fertility. This course will vastly deepen students' knowledge of sexual medicine and reproduction, focusing on the foundational science as well as clinical experiences that will provide students with the knowledge they need to care for patients of all ages. Students will pursue these topics far deeper than what is taught in second year clinical clerkships. Foundational science topics will be addressed in a series of team based learning activities that will integrate foundational science with relevant clinical experience. This course will integrate the anatomy, physiology, pathophysiology and pharmacology of sexual function and reproduction with the clinical skills necessary to interview and assess patients in these areas of medicine. Students will become familiar with a core set foundational published literature and pursue one area more deeply leading to a brief paper. At the completion of this course, students will thoroughly understand the mechanisms of sexual function and reproduction and should be able to assess sexual development, sexual dysfunction, and fertility and to develop an appropriate and sensitive treatment plan. Students should be able to approach patients about the sensitive topics of sexual health, function, identify and reproduction with knowledge, compassion and cultural sensitivity

IDIS 5633. Learning Communities IMM. The Learning Communities-Immersion course builds on prior efforts addressing student professional development that occurring in earlier Learning Communities courses. Students continue to explore vital issues of their development as professionals with further readings and small group discussions within the nurturing College environment. The sessions are designed in a developmentally appropriate manner to maximize discussions and learning based on the clinical experiences of the students. The Learning Communities-IMM course provides the environment for students to focus on further honing their own skill sets regarding ethics, cognition and leadership prior to graduation and the beginning of residency training.

IDIS 5701. FHD: Advanced Communication 1. Students will build effective communication skills with patients through exploration of topics including health literacy, cross-cultural competence and use of technology in the clinical setting.

IDIS 5702. FHD: Advanced Communication 2. Students will learn effective communication skills for having difficult conversations, spanning the spectrum from professionalism conversations with colleagues to end-of-life and goals of care discussions with patients.

IDIS 5711. FHD: Quality Improvement 1. Students will analyze their clinical microsystem using systems-level tools such as fishbone diagramming and flowcharting, and identify an area for improvement.

IDIS 5712. FHD: Quality Improvement 2. Students will propose a change to their clinic microenvironment and enact that change, collect data and reflect on their results.

IDIS 5713. FHD: Quality Improvement 3. Students will understand the basis of sustaining change and will suggest next steps for continued improvement.

IDIS 5714. FHD: Patient Safety. Students will create virtual presentations of their projects to improve quality of care/patient safety from their clinical microenvironment. Students will discuss strategies for sustaining change and will suggest next steps for continued improvement.

IDIS 5715. FHD: Quality Improvement & Patient Safety Advanced-track. Students will demonstrate knowledge of the ability to analyze their clinical microsystem using systems-level tools, identify an area for improvement, then propose and enact a change, collect data and reflect on results. Students will also understand the basis of sustaining change and will suggest next steps for continued improvement.

IDIS 5721. FHD: Interprofessional Education 1. Students will learn about other professionals' roles in patient care as well as the unique cultures, values, roles/responsibilities, and expertise of other health professionals; will learn their scope of practice; and will learn how an interprofessional team works together to provide patient care. They will observe interprofessional teamwork within the medical center.

IDIS 5722. FHD: Interprofessional Education 2. Students will integrate knowledge of their own role and roles of other team members to appropriately assess and address health care needs of patients. They will work collaboratively with other team members, seeking out other professionals for consultations in order to formulate an interprofessional care plan for mutual patients.

IDIS 5731. FHD: Health Policy: Institutions, Politics, and Advocacy. Students will be introduced to key features of the U.S. health care system as well as how to assess the performance of this system along multiple dimensions of importance. The course will supplement student knowledge about the social determinants of health and previous patient advocacy experience with insights about the key institutions, processes and stakeholders that shape health policy. Students will be exposed to the legislative and political histories of recent health reforms and use skills gained in the course to collaborate with colleagues in advocating for positive change.

IDIS 5732. FHD: Health Care Economics. Students will learn and apply core principles of health care economics to understand the state of the US health care system and future policy directions related to market forces, medical spending, and population health. The covered material will first unpack what features make health care markets special and in turn more complex relative to other goods and services. These insights will then be used to understand the incentives, challenges and landscape of contemporary health insurance and payment models for medical care. This discussion will span public and private payers as well as patient and provider behavior under different financing models and incentive structures. The course will finish by integrating these lessons with recent policy activity related to the Affordable Care Act.

IDIS 5733. FHD: Public Health and Prevention. Students will learn principles of population health including epidemiology and population-focused chronic disease management. Students will be given an individual or population-level problem and asked to propose an appropriate solution and to disclose evidence (e.g., results from existing randomized clinical trials or community interventions, or data from observational studies or the student's individual patient panels) used to arrive at a given solution. At the end of the course, students will have learned about many sources of data and key metrics (e.g., hazard ratios or odds ratios) used to interpret results from population studies, and should be able to apply public health principles in the prevention and management of disease conditions at the population level.

IDIS 5741. Intersession 1: Foundations of Health Care Delivery. Intersession 1 serves as an introduction to the Immersion Phase and teaches students details about population and community health, and chronic disease management and prevention, in addition to skills for addressing communication barriers in complex patient care interactions.

IDIS 5742. Intersession 2: EPA Week. This intersession is dedicated to providing additional preparation for the advanced patient care responsibilities in which students may engage in the fourth year. The focus is on "Core Entrustable Professional Activities for Entering Residency" as outlined by the Association of American Medical Colleges.

IDIS 5743. Intersession 3: Foundations of Health Care Delivery. Intersession 3 builds on student experience in the Immersion Phase by preparing students for working in an interprofessional health care team and practicing advanced communication skills to deal with difficult patient conversations.

IDIS 5744. Intersession 4: Foundations of Health Care Delivery. Intersession 4 introduces students to the concepts of health care economics and policy issues pertinent to caring for patients in a large macrosystem, including details about the Affordable Care Act and payers such as Medicare, Medicaid, and private insurance.

IDIS 5930. AE: Preparation for Internship. This course will provide students with essential knowledge and skills to enter internship (of any discipline) with confidence. Informed by interviews with residents and program

directors, the curriculum will cover common clinical problems managed by interns and will review most frequently-used medications. Workplace challenges, advanced communication tasks and teaching skills will also be addressed. The course utilizes a variety of methods, including lecture, small group and panel discussion, as well as skills labs and simulation.

IDIS 6001. Research Immersion: Cellular & Molecular. Laboratory-based Research, addresses the mechanisms of disease and therapeutics. The questions that are addressed often result from the need to better understand the biology of a disease or intervention and encompass both basic and applied methods of research. Basic science research is driven by the desire or curiosity for understanding in a scientific or medical realm, while applied research goes beyond understanding to solve problems. Laboratory-based research can include the traditional 'wet lab' types of research, involving experimental techniques with cells, tissues, biospecimens, or animal models, as well as devices, instrumentation, drug development, and computational research.

IDIS 6002. Research Immersion: Clinical & Translational. Clinical and Translational research is a broad area and includes research in human subjects, populations and communities, as well as laboratory-based research. Clinical research includes studies in human subjects including surveys, cross-sectional studies, case series, case-control studies, cohort studies, first-in-human, proof of principle, and all phases of clinical trials. Translational research can be divided into four categories ranging from "T1" (translation to humans), "T2" (translation to patients), "T3" (translation to practice), and "T4" (translation to populations). Clinical and translational projects often interact closely and/or overlap with other areas of research such as molecular and cellular medical research, epidemiology research, community and global health research.

IDIS 6003. Research Immersion: Community & Global Health. This approach engages communities locally and globally to hasten the adoption, integration, implementation and evaluation of population health policies and practices. Potential research in community and global health includes clinical practice and investigation, public health and biomedical science, health care delivery, basic and implementation science and community-based participatory research. This research addresses community-identified priorities and embraces health issues that disproportionately affect primarily, but not exclusively, underserved populations, including middle- and low-income countries and neighborhoods and foreign-born populations (immigrants and refugees). Areas of investigation include health risks or diseases, obstacles to achieving optimal health, socio-cultural, historical and clinical aspects of caring for underserved populations, barriers to diagnosis and treatment, and strategies/interventions that motivate patients to practice positive health behaviors.

IDIS 6004. Research Immersion: Epidemiology & Informatics. Epidemiology is the science of identifying and understanding the patterns and determinants or causes of disease in human populations. Epidemiology informs policy decisions and evidence-based practice by identifying risk factors for disease and targets for preventive health care. Epidemiologic methods are used in clinical research and public health studies and assist in study design, collection and statistical analysis of data, and interpretation and dissemination of results. Biomedical Informatics focuses on the storage, retrieval and use of biomedical information for problem solving and decision-making in health care settings. Research is applicable in all areas of health care ranging from developing, evaluating and refining the computer tools available to clinicians caring for patients, and using computer applications and techniques to assemble evidence about specific topics, to managing biologic or genomic information in ways that supports discovery and guides basic science research.

IDIS 6005. Research Immersion: Ethics, Education, Policy, and Society. Ethics, Education, Policy, and Society (E2PS) studies include the ethical and social dimensions of medicine and provide understanding about how medicine both shapes and is shaped by the larger cultural and policy environments. Encompassing a broad range of disciplines in relation to medicine, including philosophy, economics, religion, anthropology, sociology and law, related studies can help foster professional competence and responsibility, while offering guidance to practitioners and policymakers working to improve the efficiency and quality of the health care system. Research projects might include historical inquiry in

medicine, patients' or physicians' accounts of illness, along with ethical and legal aspects of health policies, technology, and genomics. Similarly, health policy studies can offer empirical insights regarding the potential impact of decisions by consumers, providers, and society by assessing policy changes or interventions on access, costs, or quality of health care.

IDIS 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

IDIS 6150. Special Research Study—VU. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

IDIS 6200. Special Study Non-Clinical. Each student arranges an independent study with a mentor and completes a period of medically relevant work. Approval required.

IDIS 6300. Full-Year Research. Students enrolled in this full-year research course are participating in various research activities including Vanderbilt Medical Scholars, Howard Hughes Medical Institute Research, Sarnoff Cardiovascular Research Program, or Fogerty International Research Scholars Program. Approval required.

IDIS 6305. Full-Year Service Learning. Students enrolled in this year-long course are participating in an activity of medical service to the community. Approval required.

IDIS 7001. Research Immersion: AWAY. This course follows the descriptions for IDIS 6001-6005 except that, for specific circumstances, the student has been approved to complete the research project with a mentor at another institution. This is allowed only with approval of all of the following: associate dean for medical student affairs, assistant dean for physician-scientist training, the student's research director, and agreement of non-Vanderbilt mentor.

IDIS 7100. AWAY ACE: Interdisciplinary. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

IDIS 7150. Special Research Study-Non VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

IDIS 7222. Ethics in Health Care: Theological and Philosophical Perspectives. [Cross-listing for DIV 7222] This course examines a broad range of theological and philosophical methods for dealing with ethical questions as they arise in contemporary American health care. We will read influential texts from Protestant and Catholic Christianity, Jewish thought, contemporary Anglo-American philosophy, as well as classic texts from the virtue traditions. Our aim is to apply the teachings of these texts to a range of practical issues, including issues at the beginning and end of life, questions that arise in routine patient care, and major policy issues in health and health care. We will probe the dialectic between practice and theory, being attentive to their reciprocal influences. A major aim of the seminar is to gain critical purchase on the tools that various theological and philosophical traditions provide as guides to thinking and action, and to assess their uses and limits. A second major agenda is to become more critically aware of our own moral intuitions and assumptions.

Global Health

IGHM 5240. Foundations of Global Health. This course introduces students to key topics, concepts and methods in global health, examining determinants of complex issues and exploring multi-dimensional approaches and interventions with a particular emphasis on low resource settings. Health and developmental issues across nations and cultures that require collective (partnership-based) action are highlighted by an interdisciplinary faculty using didactic, interactive and practical elements of instruction. At the conclusion of the course, students should be able to discuss research and evaluation methodologies commonly used in the field, identify key global health questions and design suitable projects that address the questions. This course is a requirement for the Global Health Certificate. First and second year. Fall.

IGHM 5241. Essential Skills in Global Health. This course introduces students to core research, field tools, assessment and implementation techniques, and evaluation methodologies used commonly in the field of global health. Various theories and practices that are commonly used to analyze issues and intervene in global health are explored. A key objective of the course is to examine determinants of global health and development from an interdisciplinary vantage point. Health and developmental issues across nations and cultures that require collective (partnership-based) action are highlighted. The course is taught by an interdisciplinary faculty and external resource persons using didactic, interactive and practical elements of instruction. First and second year. Spring.

IGHM 5242. Informatics for Global Health Professionals. This course serves as an introduction to medical informatics with an emphasis on global health care settings. As global health bridges both patient care and public health, so informatics in this context covers both patient-based information systems and public health information systems. International cooperation on health information system issues has resulted in both extensive knowledge repositories and a powerful set of tools and techniques that can be used by practitioners and researchers. The module consists of lectures with discussion and analysis as well as hands-on instruction with some software applications and electronic resources. This course may be taken as credit toward the Global Health Certificate. First and second year. Fall.

IGHM 5244. Ethics in Global Health. This course provides an overview of ethical issues and standards in global health, particularly with respect to ethics in international research. Its aim is to provide students in the health professions and others interested in global health with a framework in which to recognize, examine, resolve, and prevent ethical conflicts in their international work. Through readings, lectures and discussion, students will explore diverse historical and contemporary international perspectives on the concepts of ethics and health as well as formulating recommendations for prevention and resolution of ethical conflicts related to global health. This course may be taken as credit toward the Global Health Certificate. First and second year. Spring.

IGHM 5249. Case Studies in Tropical Diseases. This course will introduce tropical diseases and parasitology in a clinical case study format with student group leadership that is facilitated by faculty with substantial front-line tropical medicine training and experience. Written case protocols will be presented by faculty members and Infectious Disease fellows/Internal Medicine residents who will lead an interactive discussion involving pathophysiology, clinical presentation, differential diagnosis, diagnosis and treatment. This course may be taken as credit toward the Global Health Certificate. First and second year. Spring.

IGHM 5250. Global Health Politics and Policy. Global Health Politics and Policy introduces core global health problems facing the world's populations today and examines the efforts taken to improve health at a global level. It focuses on the social and political movements of global health issues and how these forces created and shaped global health policy both in the U.S. and among the G8 nations from 2000-2011. First and second year. Spring.

IGHM 5255. Global Health: Nicaragua. This twelve-week course is designed to expose medical students to the basic health care systems of Nicaragua centered around a one-week trip to the country. Students will gain a basic understanding of the health care disparities between Nicaragua and Nashville; understand the role of a visiting health care provider in global health stewardship; understand the role of DM, HTN, and nutrition among the Nicaraguan people. Students will work to educate Nicaraguan patients in diabetes, nutrition and cardiovascular health, and will educate the Vanderbilt community through a poster session upon their return. The class will be composed of didactic and small group case-based learning, several small group project designs, journal club, and clinic observation, culminating in a poster session. Pre- or corequisite: Basic knowledge of Spanish or the Medical Spanish elective. First and second year.

Medical Education and Administration

MADM 5750. AE: Students as Teachers. The goal of this course is to prepare immersion phase medical students to become effective teachers as residents. The course offers a longitudinal didactic program, bringing the cohort together throughout the year to discuss general teaching strategies, educational theory and to review educational literature (the need for flexibility in scheduling is recognized). This is combined with an opportunity to enhance proficiency in one specific teaching environment by participating in the delivery of a particular course or program in the general curriculum. Students will practice teaching skills, gain an appreciation for evidence-based teaching techniques, and receive mentoring and feedback from established educators.

Medicine

MED 5012. Physical Diagnosis. The introduction to clinical medicine course for second year students. Emphasizes interviewing skills, acquiring a medical database, and performing a comprehensive physical examination. Utilizes a mentor system with groups of four students assigned to two faculty tutors who will guide them through history taking, patient examinations, and write-ups. Includes lectures, practical sessions, and patient encounters. Second year.

MED 5016. Diagnostics and Therapeutics. This required course is offered during the clerkship year of the curriculum. The goals of the course are to teach techniques in clinical decision making, with an emphasis on many factors that may impact the clinician's approach to the presenting complaint, e.g. pretest probability, risks, and costs of studies; to give the students an understanding of the laboratory and radiographic tools used to work through a differential and arrive at a diagnosis; and to impart a basic understanding of treatments rendered for common disease processes that they will encounter. The full-time introductory segment at the beginning of the clerkship year will be followed by weekly exposure through the year to online modules and small group activities that delve into specific presenting complaints with explicit discussion of how the clinician works through each of these clinical problems and treats the final diagnosis. Foundations of Clinical Care phase.

MED 5020. Medicine Core Clerkship. Second-year medical students participate in an eight-week, inpatient clinical clerkship under the aegis of the Department of Medicine, using the clinical services of the Vanderbilt and VA hospitals. It is believed that learning is most vivid through direct experience with patients, obtaining histories, and doing physicals and laboratory studies, and that it is amplified by reading and intensive contact with members of the teaching staff and house staff. Students are given considerable responsibility under close supervision of the teaching staff. Six weeks of the clerkship is devoted to inpatient experience. This is further divided into three rotations; one general medicine, one subspecialty medicine, and a final that may be either general or subspecialty. Each student is assigned to a faculty/resident team and functions as an apprentice physician with graded responsibility for the evaluation and management of patients admitted to the medicine service. Students participate in clinical and teaching activities of the service, including daily attending rounds, morning report, noon conferences, Grand Rounds. Students receive student directed curricular content in the form of weekly core lectures, weekly "chalk talks" and clinical case conferences. In addition, students meet on a regular basis with an assigned Master Clinical Teacher to undergo supervised histories, physicals, and presentation with directed feedback and coaching.

MED 5302. Cardiovascular Physiology. Students will review cardiovascular physiologic principles in the setting of a high volume clinical cardiac MRI lab. Students will have the opportunity to interview patients, auscultate cardiac murmurs, review relevant records such as ECG/blood pressure measurements/heart rhythm strips; and then correlate physical exam findings and patient history with high resolution MRI imaging in a wide variety of cardiovascular pathologies. The cardiac MRI lab reviews an average of 6-8 cases a day, with cardiac conditions ranging from normal findings; atrial fibrillation; ischemic, nonischemic, and hypertrophic cardiomyopathies; congenital cases (both pre and postsurgical); pulmonary hypertension; cardiac transplant; stress testing; and cardiac valvular diseases. A

relevant cardiovascular physiologic principle will be reviewed at the beginning of each day. The physiology concepts to be reviewed will be selected depending on significance to the cases on the MRI schedule. At the conclusion of this fun and engaging two-week elective rotation, students will have reinforced their knowledge of cardiovascular physiology by combining a review of the pertinent concepts with clinically relevant and patient-oriented cardiovascular imaging cases. The combination of concept review applied to real time clinical cardiovascular imaging will strengthen the knowledge of cardiovascular physiology in a unique and unforgettable way. This elective course will provide a unique and compelling preparation for the cardiology intern year.

MED 5304. Integrative Medicine. Students in this two-week elective will participate in helping patients develop and implement treatment plans for lifestyle and behavior change through the Vanderbilt Center for Integrative Health (VCIH). The VCIH cares for the whole person—mind, body, and spirit. Using the resources of the clinic, including health coaching, the students will develop their own personal plan for wellness. They will also learn the management of chronic pain and complex chronic disease working with a multi-disciplinary team. This will include exposure to clinical consults (medical and acupuncture), therapeutic movement classes, chronic pain skills groups, and group nutrition coaching. Students will also participate in a weekly multi-disciplinary case conference. At the conclusion of the elective, students will be able to take an integrative medicine patient history with emphasis on the patient's perspective and experience of disease/illness and relevant psychosocial history; identify and describe the patient's capacity for behavioral change including barriers and readiness to change; assist patients in developing a personalized plan of care; explain integrative medicine treatment plans by citing appropriate medical literature; participate in inter-professional care to develop skills in interacting with other health professionals to develop integrative health plans for patients; demonstrate understanding of relevant neuroscience research including neuroplasticity, biomechanics, adaptive behavior patterning, biopsychosocial model, and treatment plans for patients with chronic pain (e.g. rheumatologic conditions, cancer, physical trauma, neurological disease) and frequent comorbid psychological conditions (e.g. depression, anxiety, post-traumatic stress disorder); and explain the role of central sensitization in chronic pain.

MED 5306. Prevention of Ischemic Events. This two-week elective will cover the outpatient management of cardiovascular risk, ranging from diagnosis and appropriate control of co-morbidities such as dyslipidemia, hypertension, and diabetes, to the appropriate risk assessment strategy including non-invasive vascular evaluations, to tailored interventions addressing lifestyle and medications. At the conclusion of the two weeks, students will be able to appropriately identify and diagnose cardiovascular risk factors and co-morbidities and determine the strategy for full cardiovascular risk assessment, including performing non-invasive imaging tests, positioning the patient in a definite ten-year and lifetime cardiovascular risk category, and developing a management plan including proper lifestyle and pharmacologic interventions based on guidelines, evidence, and standard of care approaches.

MED 5308. Critical Care Medicine Basics. This course is an introduction to the field of critical care medicine. Students in this rotation are expected to become familiar with the physiology and pathophysiology of critical illness and the care of the critically ill patient. Additionally, they will be expected to integrate basic knowledge of pharmacology and physiology with clinical care and decision-making across two or more ICUs. An early exposure to the breadth of critical care is imperative for every physician in training, as throughout their career they will be expected to recognize life threatening illness and injury and know the indications for providing care. Additionally, it is important to know the long term sequelae associated with critical illness and the socioeconomics of critical care. The students will be expected to attend ICU rounds and to follow the care of 1–2 patients assigned to them who are admitted to the ICU. In addition, they will be assigned to select faculty daily to present their patient. This will require them to understand the physiology and pathophysiology of the disease process to present a working differential diagnosis. They will also be expected to attend daily teaching sessions with the select faculty based on a pre-determined schedule. This includes synthesizing information from the electronic medical record, the bedside nurses, the consulting physicians, and the primary team.

MED 5312. Clinical Rheumatology. This is an outpatient service rotation designed to immerse the student extern in the evaluation and care of patients with a wide variety of rheumatic diseases. Special emphasis is placed on the patients with rheumatoid arthritis and lupus; however, all of the inflammatory and degenerative connective tissue disorders will be seen and reviewed. There is daily contact with several rheumatologists as well as the entire staff of the Arthritis Center at Vanderbilt Hospital (physical therapy, occupational therapy, patient educator, etc.). The student will observe patient evaluations and treatment methods and will be expected to perform some new patient assessments. At the conclusion of the elective, students will know the most practical and cost effective means of efficiently planning evaluations and treatments. This rotation is especially valuable to students considering primary care and orthopaedics.

MED 5314. Introduction to Palliative Care. Students will rotate through Vanderbilt Medical Center under the supervision of palliative care specialists. Students will work with the entire multidisciplinary team during this rotation with the goals of learning to apply the fundamentals in pain and symptom management, communication at the end of life, care of the dying patient, and basics of hospice care. Students will rotate on the consultative services and the palliative care unit during the two-week block. Students will gain exposure to patients throughout the hospital from all disciplines of medicine assisting in symptom management, advanced care planning, and hospice. The medical director for palliative care at Vanderbilt University will supervise and evaluate the students on the basis of the six clinical core competencies as delineated by the ACGME. Creative structuring will allow students to make modifications to the rotation to meet individual needs. At the conclusion of the elective, students will be able to gather data as it relates to palliative care; demonstrate use of an interdisciplinary team to optimize patient care; evaluate and manage common symptoms in palliative care; identify goals of care through communication with families and patients in order to develop a plan of care that includes the patient's wishes, medical situation, and code status; recognize signs and symptoms of impending death; and identify different aspects of suffering in palliative care patients.

MED 5322. HIV Medicine. Students will get a comprehensive look at the care of HIV patients by experiencing in-depth the complexities of HIV in both the inpatient and outpatient world. The elective involves spending one week at the Vanderbilt Comprehensive Care Clinic (VCCC—Vanderbilt's outpatient HIV clinic), followed by one week on the inpatient Rogers Infectious Diseases service (the inpatient service which serves the majority of HIV-infected individuals). Students will have the opportunity to take histories and perform physical exams, presenting their findings to the attending provider or nurse practitioner. Content will include lectures, readings, and small group discussions on "hot topics" in HIV. Concepts such as AIDS in the global context, treatment-as-prevention, and pre-exposure prophylaxis will be addressed in these formats, with a focus on epidemiology, pharmacology, study design, ethical issues, etc. In addition, students will spend time with various members of the HIV care team, including an HIV pharmacist, dietician, clinical pharmacy RNs, case managers, and the clinical trials team highlighting the multidisciplinary nature of HIV care with a focus on pharmacology, nutrition, adherence, psychosocial issues, and clinical trials implementation. Students will attend case conferences and will round with the inpatient Infectious Diseases nurse liaison and case manager. At the conclusion of the two-week elective, students will be able to construct or formulate a history from someone living with HIV infection, with a focus on the important physical exam findings, social information, and laboratory values from each patient; describe basic pathogenesis and basic virology of HIV infection; discuss fundamentals about HIV treatment; demonstrate a familiarity with the evidence-based, multidisciplinary approach to HIV care; and explain some of the recent breakthroughs in HIV care and some of the challenges facing the epidemic from a global perspective.

MED 5324. Team-Based Geriatric Care. In this two-week elective, students will join a team of attending, resident, and interdisciplinary team members on the Vanderbilt Acute Care for Elderly (ACE) Unit in the mornings. Experiences will include diagnosis and management of geriatric syndromes including falls, delirium, dementia, and transitions of care. Students will become acquainted with several patients and present them on rounds. Afternoons will consist of geriatric primary care and consult clinics with exposure to geriatric medication management, chronic illness,

and home and community-based services. In the second week students will round mornings with the VA Geriatric Evaluation and Management Unit Team, following and presenting selected patients and contrasting VA with Medicare resources. Afternoons will consist of VA Geriatric Consult and Primary Care Clinics, including a new Patient-Centered Aligned Care Team with a patient-centered medical home model. Relevant handouts and orientation materials will be provided, and students will participate in the ongoing Geriatrics and Palliative Care didactic series with rotating residents. At the conclusion of the course, students will be able to perform a functional assessment, contribute to an interdisciplinary team meeting, appreciate the clinical decision tree concept while managing patients with multi-morbidity states, and have an awareness of the array of community and institutional resources required to successfully manage transitions of care for frail elderly.

MED 5326. Health Promotion—Dayani Center. This two-week elective is for students interested in health education and health promotion in primarily outpatient rehabilitation programs. Students will observe and participate in the Cardiac and Pulmonary Rehabilitation Programs at the Dayani Center. Additionally, they may elect to spend a portion of this elective in the areas of physical therapy, lymphedema, nutrition, and medical fitness. The format of the elective is direct patient observation. Students may observe graded exercise testing and discuss with staff. At the conclusion of the elective, students will know the fundamental principles of health promotion and understand lifestyle management of common cardiovascular diseases.

MED 5328. Clinical Medicine Sub-Specialties. In this two-week elective, students will work with sub-specialists in clinics of their choosing in the Department of Medicine. Students will have the responsibility of evaluating patients, presenting patients to the attending, and then devising a management plan with the attending. Students are responsible for arranging the clinic half days (minimum 10 half days per 2 week period) with attendings to be approved by the course director. At the conclusion of the elective, students have an understanding of the outpatient presentation and management of sub-specialty patient problems, will provide an efficient patient work-up, and will have familiarity with the care provided to patients in the outpatient clinical setting.

MED 5332. Problems in Hematology. This elective will offer students an introduction to the unique problems of hematology, including anemia, bleeding, thrombosis, transfusions, and hematologic neoplasms, including lymphoma, leukemia, and myeloma. Didactics will include lectures and a series of articles provided for the rotation. The emphasis will be on diagnosis and management of patients with hematologic cancers. Students will spend time in hematopathology, blood bank, and clinics, ranging from benign to malignant hematology and transplant. They will also rotate on a malignant hematology inpatient service and the transplant service. Students will be given patient consult cases to guide their learning, and they will be asked to present a written case history and a plan of care, emphasizing hematologic issues, including transfusion needs, antibiotic prophylaxis if needed, therapeutic options, and prognosis. As part of the therapy, other areas to be addressed will be symptom management, side effects of therapy, survivorship, and end of life care and the roll of palliation and hospice. At the conclusion of the two-week elective, students will understand some of the questions to be asked, answers to those questions, what is involved in devising a plan of treatment, and communicating with the patient, recommending a plan of therapy. Students will learn how to discuss not only a therapeutic plan, but also a prognosis.

MED 5336. Young Women's Health. This elective will offer students a two-week rotation in the Adolescent and Young Adult Health Outpatient Clinic at 100 Oaks with an Adolescent Medicine attending and residents. This clinic has a patient population that is about 70 percent female and sees a large number of visits for menstrual and gynecologic issues. Patients are evaluated for primary and secondary amenorrhea, menorrhagia, dysfunctional uterine bleeding, and dysmenorrhea. Patients are routinely counselled on initiation of contraception and are screened for sexually transmitted infections. Students will have the opportunity to observe patient encounters with the resident and/or attending and then as they feel more comfortable see the patient first and present them to the attending in order to jointly form a plan of care for that patient. At the conclusion of the two-week elective rotation, the student will be able to take a thorough menstrual history and

formulate a brief assessment and plan based on presenting complaints/concerns. The student will also feel comfortable taking a sexual history and become more comfortable with various contraceptive options. In addition, the student will review the adolescent specific laws on confidentiality as they pertain to young women's health issues.

MED 5610. ACE: Clinical Nephrology. This experience is designed to give the immersion phase student significant experience in practical clinical nephrology and prepare him or her for future house staff training. Students will participate in daily rounds with the nephrology attending, the nephrology fellow, and the medical resident assigned to the Vanderbilt Hospital nephrology service or the VA nephrology service. Patients with various clinical disorders including fluid and electrolyte abnormalities, acid-base disturbances, glomerular diseases, and disturbances of renal function, including acute and chronic renal failure, will be seen and discussed. Students will have the opportunity to perform renal consults and present patients to the rest of the rounding team. Frequently, the nephrology service is requested to perform emergency consultation which requires acute hemodialysis or acute plasmapheresis. Students may participate in these acute consultations, assist with acute dialysis catheter placement, and develop an understanding of renal emergencies and their treatment.

MED 5611. AI: Medicine, VU. A student may serve as an acting intern on the Vanderbilt or Nashville VA general medicine services, with direct supervision by an attending and upper level resident. Acting interns may carry up to six patients and may perform up to three admissions and two ICU transfers daily. Patients assigned will be selected for their teaching value, and the student will be expected to function as a member of the team at a supervised intern level for patient management and communication with other health care providers. This will include preparing the admission history and physical examination, entering orders, writing daily progress notes, presenting patients on daily work rounds, caring for a near intern-level patient census and coordinating discharge planning. This format provides an excellent opportunity to evaluate and manage patients with a wide variety of interesting disease processes and allows the acting intern to take more responsibility in the care of his/her patients in preparation for intern year.

MED 5613. ACE: Critical Care, VU. This course is a four-week experience in multidisciplinary critical care medicine from the perspective of internal medicine. The student will be expected to fulfill much of the role of a junior level house officer, but will be closely supervised by interns, residents, and a senior critical care fellow, as well as a critical care attending. The unit is a very active critical care facility which manages a wide variety of medical emergencies using extensive monitoring and support equipment. The emphasis is on pulmonary disease, infection, and renal dysfunction, but covers all aspects of critical illness, including endocrinology, nutritional support, cost containment, and ethical issues. Teaching rounds are given daily, and these are supplemented with didactic lecture-discussions several days each week. Fulfills the acute care course requirement.

MED 5616. AI: Medicine, VAH. This acting internship on the Veterans Administration Hospital medical wards allows students to work in concert with the house staff team (assistant resident, intern, and one or two third-year medical students). The acting intern will be assigned new patients each admitting day and will be responsible for their care under the direction of the assistant resident. The acting intern's patients will not be worked up by the regular intern. The student will be expected to attend all of the functions and keep the same hours as the house staff. This should provide an intensive experience in ward medicine.

MED 5619. AI: Critical Care, VAH. This acting internship in the MICU/CCU at the Department of Veterans Affairs Hospital is intended to expose medical students to a variety of important diagnostic and management issues in critical care medicine. The student should have prior general ward experience in medicine and surgery. The student will function in the combined MICU/CCU as an acting intern under the supervision of a medical resident, a pulmonary/cardiology fellow, and both a pulmonary/critical care and a cardiology attending. The student will actively participate in both general medical intensive care and cardiac intensive care rounds. The student will have an every-third-night in-house call schedule and will work directly with residents and interns. Students will take primary responsibility for patient assessment, documentation and order entry. Students may have a higher patient census than in prior ICU rotations and will assume increasing responsibility for

patient care as the month progresses. During the rotation, the student will learn how to evaluate complex critically ill patients and formulate diagnostic and therapeutic plans. The student will become familiar with the principles and techniques of invasive and non-invasive monitoring. Major areas which are stressed include cardiopulmonary pathophysiology, crisis management, ICU and CCU pharmacology, airway management and mechanical ventilation, fluid/electrolytes management, nutritional intervention, and ICU ethics. By the end of the rotation, the student should be comfortable in the initial assessment and treatment and ongoing care of the most common ICU/CCU admitting problems and will be prepared for residency ICU rotations. Fulfills the acute care course requirement.

MED 5620. ACE: Gastroenterology, VU. The adult gastroenterology rotation offers a broad experience in the evaluation and management of adult patients with gastrointestinal disorders such as inflammatory bowel disease, gastrointestinal bleeding, pancreatitis, jaundice, abdominal pain, the use of enteral feeding, and swallowing abnormalities. The rotation would include evaluation of hospitalized adult patients and rounds with the inpatient gastroenterology consultation service at Vanderbilt Medical Center. Students would function as a gastrointestinal consultant, participate actively in inpatient rounds, and participate in teaching conferences sponsored by the division. There would also be exposure to gastrointestinal endoscopic techniques throughout this rotation.

MED 5625. ACE: Endocrinology. This course is designed to give our medical students exposure to the myriad of endocrine disorders seen by the faculty in the Vanderbilt Division of Endocrinology, Diabetes and Metabolism. It is intended to give medical students the opportunity to evaluate patients with different endocrine disorders, with a focus on physical exam findings, laboratory data, and radiological data. In addition, medical and surgical management of these disorders will be taught. Didactics will supplement the clinical experience and include pathophysiology of these disorders. Both diabetes mellitus and non-diabetes endocrinopathies, including thyroid, pituitary, bone, calcium metabolism and adrenal disorders, will be incorporated into this course.

MED 5655. ACE: Geriatric Medicine. The intent of this course is to provide students with an advanced educational experience in geriatric medicine. Students will gain familiarity with multiple geriatric syndromes: polypharmacy, gait instability, dementia, fragility, pain management, pressure sores, incontinence, osteoporosis; appreciation for continuity of care across different levels of care; and the ability to differentiate between normal aging and disease processes. Students' knowledge of ethical issues will also be enhanced including patient autonomy, driving, and elder abuse. Students will also be able to identify and use community resources effectively, assess and treat multiple geriatric syndromes, organize management of multiple acute and chronic diseases simultaneously, and communicate sensitively and effectively with older persons and caregivers.

MED 5680. ACE: Infectious Diseases. Students will participate as part of the inpatient infectious diseases consultation service for at least two weeks of their rotation. They will be active participants in the initial evaluation, management, and follow-up of patients on the consult service. They should gain competence in diagnostic skills and in the management of infected patients, including the choice and use of antibiotic therapy. Special emphasis will be placed on understanding the epidemiology, pathophysiology, and natural history of infectious diseases. Students will also have a comprehensive experience in the care of HIV patients by participating in both the inpatient and outpatient settings. This portion of the experience will involve spending time at the Vanderbilt Comprehensive Care Clinic (Vanderbilt's outpatient HIV clinic) and/or the inpatient Rogers Infectious Diseases service (the inpatient service that serves the majority of HIV-infected individuals). While in these settings, students will spend time with many members of the HIV care team, including pharmacists, dietitians, clinical pharmacy nurses, case managers, and others to better appreciate the multidisciplinary care needed to address medical comorbidities, medication adherence, psychosocial issues, and other issues pertinent to HIV-infected individuals. Learning opportunities in the course will include live sessions in the form of core content lectures, grand rounds, and/or small groups; online lectures; and recommended readings. Core infectious diseases and HIV/AIDS topics will include antibiotic selection and pharmacology; skin and soft tissue infections; endocarditis; opportunistic infections; HIV antiretroviral therapy; and others.

MED 5691. AI: Cardiac Critical Care. During the acting internship in Critical Care Cardiology, students will actively participate in the management of patients hospitalized in the Cardiovascular Intensive Care Unit. Duties will include the management of patients with (1) cardiogenic shock and acute heart failure, (2) complicated myocardial infarction, (3) complex percutaneous coronary and valvular intervention, (4) pulmonary arterial catheters and continuous hemodynamic monitoring, (5) ventricular support devices, (6) mechanical ventilation, and (7) cardiac arrhythmias. The student will work closely with the on-call medical resident and CVICU fellow and be expected to write admission and daily progress notes and present patients followed on daily work rounds to the entire team. The rotation will provide a significant "hands-on opportunity" for medical students to participate in the management of critically ill patients. Students will be expected to assume the role of the intern, carrying multiple patients and accepting increased responsibility for their care in order to prepare them for residency. This will be a more robust experience than prior critical care rotations.

MED 5700. ACE: Shade Tree Clinical Service Learning. The Shade Tree Clinic Community Health Experience offers a profound and rich exposure to primary and specialty care medicine in a resource-limited setting at a sub-internship level of responsibility. This course is a longitudinal ACE during the Immersion phase for senior medical students. The Shade Tree Clinic Community Health Experience is an opportunity to develop clinical case management skills in the context of complex social determinants of health. Students are exposed to community resources needed to provide holistic care to vulnerable patients. They also gain creative, critical thinking skills necessary to confront challenges faced in a resource-limited context. Participating students have the opportunity to (1) enhance clinical patient care skills, (2) mentor and teach junior students, and (3) participate in didactic/skill sessions for advancement of clinical, advocacy, and leadership skills. Students will be expected to schedule 20 clinic shifts throughout the course and complete a final project (or equivalent), which may include leadership and/or staff roles. Clinical skills and knowledge will be assessed incrementally throughout the course.

MED 5730. ACE: Cardiovascular Diagnostics. This course will emphasize the development of skills in EKG interpretation and cardiovascular physical diagnosis. In addition, students will become familiar with the full spectrum of cardiovascular imaging modalities. The aim will be to appreciate their relative strengths and weaknesses as well as indications, techniques, and interpretation. The student will see patients in consultation with cardiology faculty at Vanderbilt and the Nashville VA Medical Center. Regular bedside physical diagnosis rounds will be held with senior Vanderbilt faculty. The student will also be instructed in the use of a heart sound simulator which has been demonstrated to improve diagnostic skills. There will be didactic sessions on EKG interpretation and cardiovascular imaging (including stress testing, nuclear cardiology, echocardiography, coronary angiography, and cardiovascular MR). Finally, weekly conferences to attend include: Clinical Cardiology (2), Echocardiography, Nuclear Medicine, and Cardiology Grand Rounds.

MED 5735. ACE: Palliative Care. Students will rotate through VUMC, the VA Hospital, and community hospice agencies under the supervision of palliative care specialists. Students will follow their own patients and work with an interdisciplinary team (IDT). This opportunity will allow students to learn and apply the fundamentals in pain and symptom management, how to communicate at the end of life, care of the dying patient, and hospice criteria. Students will spend roughly two weeks with the VUMC consult service, one week at the VUMC Palliative Care Unit, and one week at the VA. They will also work several days with community hospice members, child life specialists, chaplains, case managers, social workers, and nurses. At VUMC and the VA Hospital, students will work with the inpatient consultative team and see patients throughout the hospital from all disciplines of medicine assisting in symptom management, advanced care planning, and hospice information. During their time with hospice, they will accompany members of the IDT on home visits and learn more about their various roles in end of life care. The palliative care physicians and nurse practitioners will supervise and evaluate the students on the basis of the six clinical core competencies as delineated by the ACGME. Creative structuring will allow students to make modifications to the rotation to meet individual needs.

MED 5740. ACE: Pulmonary Consult. This course consists of seeing all pulmonary consultations at VU Hospital, presenting the cases to conferences and rounds, participating in pulmonary laboratory testing, fiberoptic bronchoscopy, and cardiopulmonary exercise testing, and attending joint pulmonary conferences. Case mix includes chronic obstructive pulmonary disease, pulmonary renal syndromes, vasculitis, sleep apnea, pulmonary nodules, infectious and non-infectious pulmonary infiltrates.

MED 5760. ACE: Rheumatology. Time will be spent primarily in the rheumatology clinic at the Vanderbilt clinic in the VA Hospital (VAH). Students will have an opportunity to be involved in the consultation from the hospital with the rheumatology team at VUMC and VAH. Students will have an exposure to several clinics with different rheumatologists each day, and they will observe patient evaluations and treatments. Materials for study will be given. There will be an expectation from a student to perform patient assessment especially in terms of history taking and physical examination focusing on rheumatology. Students will have an opportunity to attend all rheumatology conferences, in both clinical and research meetings.

MED 5780. ACE: Medical Oncology. This Advanced Clinical Experience will provide the student with a broad overview of clinical oncology. Inpatient exposure will be centered at Vanderbilt Hospital, where the student will assist in the evaluation of new oncology service admissions and new consultations. The student will make morning rounds and present new cases to the oncology attending. In addition to inpatient exposure, the student can attend two to three outpatient clinics per week. During the rotation, the student will also attend the Division of Oncology conferences at Vanderbilt.

MED 5785. ACE: Hematology-Oncology. The goal of this course is to introduce students to the core concepts of hematology, how they are applied to patient care in the inpatient and outpatient care setting, and how various components including clinical hematology, hematopathology, blood banking, and coagulation medicine interplay to provide comprehensive hematologic care. Students will have two weeks of hands on experience in the management of hematologic disorders in the inpatient setting. The remaining two weeks will be spent in the ambulatory clinic setting, inpatient consults and laboratory exposure.

MED 5790. ACE: Clinical Dermatology. This clinical experience will be in the outpatient clinic setting and the inpatient consultation setting with direct faculty interaction. The location of clinic assignments will be in the VU Dermatology Clinic at Vanderbilt Health One Hundred Oaks and the Dermatology Clinic at the Nashville VA Hospital. There will be participation in weekly conferences specifically for the rotators on the clerkship. The didactic lectures during the month will focus on the identification, treatment, and management of common dermatologic diseases. The clinical experience will reinforce the lectures plus give insight into the role of the dermatologist as a consultant for less common and difficult to treat conditions.

MED 5825. ACE: Medical Ethics. This course is designed as a capstone experience in ethics, building upon the ethics components in FMK and FCC. The core activity will be participation in the activities of the clinical ethics consultation service provided to Vanderbilt Medical Center by the faculty of the Center for Biomedical Ethics and Society. Activities during this four-week ACE will include directed readings in areas related to the consult work, attendance at conferences, lectures, case reviews and additional work in ethics of special interest to the student's future residency training. The course will fulfill the immersion course requirement for the Certificate in Bioethics, although being a candidate in the certificate program is not a requirement for taking this course. Discussion with Dr. Joe Fanning, the Director of the Clinical Ethics Consult Service is strongly recommended prior to enrollment.

MED 5970. AE: Fundamentals of Quality Improvement. The Fundamentals of Quality Improvement (QI) in Health Care half-year elective provides Immersion phase students with an opportunity to gain foundational knowledge of QI and patient safety principles in health care. Medical students will participate in an elective course offered to students from the schools of medicine, management, nursing, and education that runs weekly from January through April. The course will challenge students to think in an interdisciplinary manner about models and team-building strategies for leading QI initiatives in a variety of organizational settings.

Students will form interdisciplinary teams to complete a final group project. Students will also complete the IHI Open School online certificate. This course offers an opportunity to complete a project that qualifies for FHD QI/PS advanced track.

MED 6100. Special Clinical Study: Medicine, VU. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

MED 7100. AWAY ACE: Medicine. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

MED 7150. Special Research Study: Medicine, VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

MED 7200. AE: Global Health. This four-week AE is an extension of the Global Health ISC and aims to provide clinical experience in the care of patients in low- and middle-income countries (LMICs), most often in resource-constrained environments. Students will assess the most common health problems encountered at the site, the usual treatment protocols, and how management differs from that in the U.S. or other developed countries. Students will learn how treatment and treatment decisions are influenced by local contexts, policies, and cultural components. In this AE, students will mindfully and ethically draw on their 'resourcefulness' to navigate the various constraints of working in resource-constrained settings. The hospital or clinic site is arranged by the student and approved by course director. Approval can be facilitated by Vanderbilt faculty involvement at the site. Students may elect to combine clinical work with language immersion studies (particularly Spanish). If the intended location is on the State Department Travel Alert List, additional approval will be required. Students are responsible for covering all of their personal expenses associated with the course and travel, but small amounts of funding may be available.

Neurology

NEUR 5020. Neurology Core Clerkship. The rotating students of the third-year class are alternately assigned to two two-week (total=four weeks) rotating blocks of clinical neurology inpatient and outpatient experience. Students are given direct responsibility for the evaluation and care of patients under the supervision of house staff and faculty. This exposure is intended to provide the students with an approach to patients with diseases of the central, peripheral, and autonomic nervous systems and skeletal muscles. At the end of the rotation, students will take the NBME exam. Departmental recognition is given to the highest NBME score. Exposures to other areas of neurology can be arranged; talk to the clerkship director. Third year.

NEUR 5315. Movement Disorders & Deep Brain Stimulation. The overall goal of this elective is to immerse students in the evaluation and treatment of patients with movement disorders. Students will spend time with these unique patients from diagnosis to advanced stages. The elective will include brief didactics on the most commonly followed disorders including Parkinson's disease and essential tremor. Clinical time will be spent in the Neurology Clinic diagnosing and medically treating patients. Students will be involved in the selection of patients for surgical intervention. In the operating room, student will participate in all stages of deep brain stimulation (DBS) surgery from the neurology, neurosurgery, and neurophysiology perspectives. Students will assist with post-operative DBS programming. Additional time will be spent working closely with Neurosurgery in planning surgeries. Students may also attend the multi-disciplinary DBS conference which occurs once a month. At the end of the two-week rotation, the student will feel confident in the presentation, examination, diagnosis, and treatment options for patients with movement disorders. Students will be expected to demonstrate a focused history and neurologically focused physical exam and will be able to articulate the indication for DBS, expected benefit, and potential risks.

NEUR 5612. ACE: General Neurology. Students will participate in a four-week General Neurology Advanced Clinical Experience that will have a flexible schedule to allow students to pursue specific interests. The schedule will

be individually tailored through discussion/planning with the ACE director and involve participation in the following venues: outpatient clinic, general inpatient neurology service and adult neurology consult service. Students may choose to spend all four weeks in one venue or put together a combination of two or three venues.

NEUR 5620. ACE: Stroke. Students will participate in a four-week Stroke Advanced Clinical Experience that will involve inpatient, outpatient and procedural activities. The main venue of participation will be the inpatient stroke service where students will be responsible for carrying a census of patients (presenting on rounds), going to and assisting with stroke alerts, and participating in the education of clerkship students on the service. Students will also have the opportunity to go to stroke clinic and the angiogram suite to learn about and observe diagnostic angiograms and intra-arterial procedures. Students will also attend the weekly multidisciplinary cerebrovascular conference, and spend time with the Neuro ICU team. Students will be expected to stay for overnight call at least two times during the four-week rotation.

NEUR 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

NEUR 7100. AWAY ACE: Neurology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

NEUR 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Obstetrics and Gynecology

OBN 5020. OB/GYN Core Clerkship. Each member of the third-year class is assigned to the obstetrics and gynecology service for five-and-one-half weeks. Vanderbilt University Hospital. Each student will spend two-and-one-half weeks on the obstetrical rotation. While on the maternal-fetal service this will include daily attending rounds and involvement with the maternal-transport service. Students will also be assigned to the perinatal group practice service. In addition to being involved on labor and delivery, students will help manage obstetric patients who are followed in the Vanderbilt Clinic. Each student will spend two-and-one-half weeks on gynecology. Each student will spend one-half day per week in continuity clinic, one-half day in colposcopy clinic, and one-half day in clinical transaction project. Daily teaching rounds are conducted by the GYN oncologists. The general gynecology service provides exposure to the medical and surgical management of patients seen at the Gynecology Clinic. The two-week rotation at Baptist Hospital provides excellent exposure to operative gynecology and to gynecology in the private practice setting. In addition, students are encouraged to observe surgical cases performed by the reproductive endocrinology service. The five-and-one-half-weeks rotation provides a broad based introduction to the discipline of obstetrics and gynecology. Included in the rotation is a lecture series given by the faculty covering general obstetrics, high-risk obstetrics, gynecologic oncology, reproductive endocrinology, and general gynecology.

OBN 5620. AI: Maternal Fetal Medicine. During this rotation, the student receives advanced experience in high-risk obstetrics designed to gradually provide the student with a sense of responsibility and ownership for the patients under his/her care similar to that of our first year residents. Students help to direct both the antepartum and postpartum care of patients with preterm labor, PPRM, and pregnancy-induced hypertension. By the end of the rotation, the student is responsible for daily documentation including admission/discharge/daily progress notes, supervised order entry, and patient cross-cover reporting to the resident team. The student is expected to be familiar with the main complications of pregnancy, be confident in delivering directed and concise patient assessments and treatment plans, and have mastered the mechanisms of normal labor and delivery. Specific learning activities include daily morning obstetrical teaching rounds; attendance at resident didactics; participation in resident OB emergency simulation training when available, and overnight call on labor and delivery suite. Learning resources include one-on-one interactions with

the obstetrical house staff and attendings, access to current obstetrical texts and journals, and teaching conferences.

OBN 5630. ACE: Maternal Fetal Medicine. During this rotation, the student receives advanced training in high-risk obstetrics at the student level. Students may help to direct either the outpatient antepartum or inpatient peripartum care of women with common complications of pregnancy, including preterm labor, pre-gestational diabetes, chronic hypertension, PPRM, and preeclampsia. By the end of the rotation, the student should be familiar with common complications of pregnancy and be confident in delivering directed and concise patient assessments and treatment plans. Students have the option of designing an inpatient or outpatient experience which will depend upon learning objectives identified during the intake interview with the course director. Inpatient learning activities include daily morning obstetrical teaching rounds and inpatient service responsibilities with the resident team. Outpatient learning activities would include attendance in MFM return OB and consult clinics, with additional time spent in diabetes clinic, obstetrical ultrasound, and genetic counseling. This rotation will require four (4) overnight calls on labor and delivery suite and two (2) independent presentations on a topic of interest with your MFM preceptor who will be identified depending upon your area(s) of interest. Learning resources include one-on-one interactions with the obstetrical house staff, midwives, and MFM attendings, access to current obstetrical texts and journals, and teaching conferences.

OBN 5635. ACE: Clinical Obstetrics. This course is designed to be a focused experience on labor and delivery to give students more experience in basic management of obstetric patients. This course will familiarize the student with the physiology of labor and delivery. Students will be expected to work with the team learning cervical exams, basic ultrasound assessment, and delivery skills. They will also work with the team in the operating room learning skills for cesarean delivery. The student will also follow postpartum patients with the residents and attendings. An individualized curriculum will be planned which will include experience on days and nights with the team on labor and delivery and in triage. The student will be expected to assist with teaching the FCC students on the rotation as well. The student should finish this experience with confidence to complete tasks required of an intern on their labor and delivery rotation.

OBN 5645. AI: Operative Gynecology. During the rotation, the student will receive both didactic and clinical training, as well as practical experience in the diagnosis and management of a breadth of ambulatory and surgical gynecologic problems. The student will participate in office and preoperative evaluation, in addition to ambulatory and surgical management of patients. The student will be expected to attend didactic lectures and seminars of the OB-GYN department and prepare a presentation on a topic of interest to be determined in consultation with one of the attending faculty.

OBN 5650. AI: Gynecologic Oncology. During this rotation, the student receives training in the management of gynecologic oncology patients. The student will function at the level of an intern and will be primarily responsible for 3-5 inpatients under the direct supervision of the attending gyn oncologists. The AI's patients will NOT be directly cared for by the residents on service. The student will be expected to pre-round, write orders, call consults, and follow-up tests on his/her assigned patients. The student will also participate in select surgical cases as assigned by the chief resident on service. By the end of the rotation, the student should be familiar with the staging of different gynecologic malignancies, common treatment modalities, important prognostic factors affecting survival, common post-operative complications, and care of the acutely ill surgical patient. Specific learning activities include pre- and postoperative care of the oncology surgical patient, assistance in the operative cases on the service, presentation of his/her own patients at weekly tumor board, and a 15 minute presentation on a specific GYN oncology topic of his/her choosing (with approval of the course director).

OBN 5655. ACE: Gynecologic Oncology. During this rotation, the student receives training in the management of gynecologic oncology patients. The student participates in the evaluation and treatment of patients, gaining experience in surgery, colposcopy, pathology, chemotherapy, and radiation techniques. The student will be primarily responsible for 2-3 inpatients at any given time under the direct supervision of

the resident on service. By the end of the rotation, the student should be familiar with the staging of different gynecologic malignancies, common treatment modalities, and important prognostic factors affecting survival. In addition, the student will be exposed to the immediate postoperative care of the acutely ill patient. Specific learning activities include pre- and postoperative care of the oncology surgical patient, assistance in the operative cases on the service, and attendance in the private clinics of the oncology attending.

OBN 5660. ACE: Female Pelvic Medicine and Reconstructive Surgery. During this rotation the student receives training and practical experience in the diagnosis and management of pelvic floor defects and dysfunctions. The student will participate in preoperative evaluation, surgery, and post-operative follow-up of operative cases. In addition, there will be exposure to conservation treatment including pelvic floor rehabilitation and insertion/management of pessaries. History and physical exam of pelvic floor defects are also emphasized.

OBN 5665. ACE: Operative Gynecology.

OBN 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

OBN 7100. AWAY ACE: Obstetrics/Gynecology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

OBN 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Ophthalmology and Visual Sciences

OPH 5320. Introduction to Ophthalmology. Students will join a team of attending and resident physicians on the ophthalmology service at Vanderbilt Hospital. Ophthalmology involves working as a consultant and primary care physician to patients both in the hospital and in the clinics. Reasons for consultation requests vary, but common requests include retinal disease, glaucoma, infectious diseases, trauma, and congenital anomalies. There will be six choices of subspecialty services on which the student may rotate over the two weeks. These include retina, glaucoma, cornea, oculoplastics, neuro-ophthalmology/consults, and pediatrics. At the conclusion of the two-week elective, students will be able to take an ophthalmology history and physical examination, arrive at a diagnosis, and understand treatment plans. Additionally, students will have familiarity with evidence-based approaches to care and the role of an ophthalmology surgeon in a teaching hospital.

OPH 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

OPH 7100. AWAY ACE: Ophthalmology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

OPH 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Orthopaedic Surgery and Rehabilitation

ORTH 5325. Pediatric Sports Medicine. Students will spend time with various attendings in the pediatric orthopaedic, sports medicine, and adolescent clinics at Vanderbilt. They will also attend the sports medicine fellows lecture series and a sports event if available during the rotation. They will be expected to read Hoppenfeld's text—*Physical Exam of the Spine and Extremities*. Upon completion of the rotation, the students will be expected to understand the diagnosis and management of pediatric fractures, concussion, and overuse injuries. Students will perform a physical exam of the spine and extremities.

ORTH 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

ORTH 7100. AWAY ACE: Orthopaedics. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

ORTH 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a research project away from Vanderbilt. Approval required.

Otolaryngology

OTO 5310. Introduction to Otolaryngology. Students will join the attendings, fellows, and residents on the Head and Neck Division of the Department of Otolaryngology. This service provides surgical care for patients with benign and malignant tumors of the head and neck, including tumor resection and reconstruction, as well as airway reconstruction. It is a busy service which carries the largest inpatient census in our department. Students will see patients in the office and hospital setting, intra-operatively and post-operatively. Students will also have the opportunity to work with our speech pathologists and physical therapists as well. Students will participate in our weekly multi-disciplinary tumor board to better understand both surgical and non-surgical management of head and neck tumors. At the conclusion of the two weeks, students will be able to take a directed history, perform a basic head and neck examination, and observe and understand the basic surgical approaches to tumors of the head and neck. They will also understand basic reconstructive options for head and neck defects. Most importantly, they will understand the multi-disciplinary approach to patients with head and neck cancers.

OTO 5315. Introduction to Laryngology. The human larynx is a very complex instrument and one that enables us to communicate with each other through speaking and song, as well as protecting our airway from aspiration during deglutition. We recognize each other through our voices and our unique, individual sound helps to define who we are. Technological advances allow us to study the larynx real time in the office and help us to offer patients highly specialized, individualized treatments based on the results of these studies. In this two-week elective, students will participate in the management of patients with disorders affecting the larynx and upper aerodigestive tract, including dysphonia, breathing difficulties, and dysphagia. Students will work with a team of the attending, fellow, and resident physicians from the Vanderbilt Voice Center in both clinic and operating room settings. In the clinic, students will learn the specialized evaluation of the patient with a vocal, breathing, or swallowing complaint. Diagnosis and treatment of common laryngological disorders will be presented and discussed. The student will also interact with and observe the voice speech and language pathologists and vocal pedagogues that complete the multidisciplinary team of the Voice Center. These practitioners provide both diagnostic support and behavioral treatment for patients. Students will be exposed to diagnostic procedures, specifically indirect laryngoscopy and laryngeal videostroboscopy. In the operating room, students will observe endoscopic treatment of a variety of common laryngeal, upper airway, and esophageal disorders. These disorders may include benign vocal fold lesions, vocal fold paralysis, upper airway stenosis, and cervical esophageal stenosis. At the conclusion of the two-week rotation, students will be able to take a specialized laryngological history; perform a complete head and neck examination; discuss common disorders affecting the larynx, upper airway, and cervical esophagus; and describe the treatment of common disorders affecting the larynx, upper airway, and cervical esophagus.

OTO 5325. Clinical Rhinology. In this elective, students will have the opportunity to learn about nasal and sinus disorders and their relationship to diseases of the respiratory tract. Students will learn the pathophysiology of sinus disease and how nasal and sinus anatomy interact with allergy and other immunological diseases to affect the entire airway. The students will also learn how nasal anatomy affects patients in their ability to function in everyday life. The students will accompany the surgeon to the operating room to observe how endoscopic sinus surgery is performed. The elective will also include benign and malignant diseases of the sinuses and skull base. Students will focus on the anatomy of the skull base and the various

pathologies seen clinically. Students will spend time with the skull base surgeon in both a clinical setting and the operating suite. Students will follow the patient from the time of surgery to the first post operative appointment. In the clinics, students will learn about nasal and sinus endoscopy; CT and MR scans of the paranasal sinuses and skull base; physiology and bacteriology of the nose and sinuses and the close relationship with the lungs and pulmonary function; and medications available to treat nasal and sinus disorders. Students will also observe the allergist/immunologist. At the end of the two-week rotation, students will be knowledgeable of the common presenting symptoms of nasal and sinus disorders, and the anatomy and pathophysiology of nasal, sinus, and skull base disease. They will be able to read sinus CT and MR scans, and will be able to present a case concerning the presenting symptoms and diagnostic factors of a case and the available treatment paradigms.

OTO 5335. Introduction to Neurotologic Surgery. Neurotology is a subspecialty of otolaryngology (ENT) that deals with the evaluation and treatment of disorders of the ear, including adult and pediatric hearing loss, intracranial tumors, vertigo, facial nerve disorders, and complex infections of the ear. The specialty is multi-disciplinary and interacts frequently with other otolaryngology specialists and faculty and staff in neurosurgery, neurology, audiology, speech and language pathology, deaf education, physical therapy, and others. Students will participate in all aspects of the diagnosis and management of patients with neurotologic disorders. In the operating room students will be able to participate in and observe complex procedures such as cochlear implants, acoustic neuroma surgery, tympanic membrane reconstruction, stapedectomy, mastoidectomy and eradication of the ear, and vestibular surgery. Students will participate as members of our cochlear implant team, learning basic and advanced audiologic testing, cochlear implant evaluations, team assessment and integration, surgery, and post cochlear implant evaluation. Students will be able to participate in the activation of the cochlear implant, seeing adults and children hear for the first time. At the conclusion of the two-week rotation, students will be able to perform a specialized ear history and complex head, neck, and neurotology exams. They will be familiar with the disorders of the ear, including infections, hearing loss, vertigo, tinnitus, and intracranial tumors of the ear including meningioma, acoustic neuroma, and facial nerve disorders; the systems based practice involving multi-disciplinary care of neurotologic disorders, including working with the cochlear implant and surgical teams; surgical procedures involved with treating patients with complex otologic disorders; and the appropriate surgical set up, procedure, and equipment.

OTO 5340. Introduction to Facial Plastic and Reconstructive Surgery. Facial plastic and reconstructive surgery is an integral part of the training in otolaryngology—head and neck surgery. The face is the cornerstone of a person's identity. Facial expression implies a revelation about the characteristics of a person, a message about something internal to the expresser. The goal of facial plastic and reconstructive surgery is to restore, maintain, or enhance a patient's facial appearance. Students will participate in the management of patients with disorders affecting the face. Students will work with both attending and resident physicians from the division of Facial Plastic Surgery in both the clinic and the operating room. In the clinic, students will learn the specialized evaluation of the patient with congenital, malignant, traumatic, and medical conditions affecting various components of the face. Diagnosis and treatment of common facial disorders will be presented and discussed. Considerations of facial aesthetics will also be reviewed. In the operating room, students will observe treatment of a variety of common nasal, auricular and cutaneous disorders. These disorders may include facial fractures, nasal deformities, facial defects, and facial paralysis. At the conclusion of the two-week rotation, students should be able to take a specialized history pertinent to facial deformities; perform a complete head and neck examination; discuss common disorders affecting the nose, external ears, eyelids, lips, and facial skin; and describe the treatment options of common disorders amenable to facial plastic surgery.

OTO 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

OTO 7100. AWAY ACE: Otolaryngology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

OTO 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Pathology

PATH 5310. Pathology as a Career. Physician practice in the field of pathology takes place within a diverse range of sub-disciplines under the general divisions of Anatomic Pathology (AP) and Clinical Pathology/Laboratory Medicine (CP). The goal of this elective is to offer an introductory experience whereby students can participate in and observe the daily activities of multiple practice settings in both AP and CP. Opportunities exist for exposure in the areas of surgical pathology, cytopathology, autopsy pathology, hematopathology, molecular diagnostics, transfusion medicine, clinical microbiology, and clinical chemistry, among others. Attendance at intradepartmental educational conferences and relevant multidisciplinary clinical conferences will be strongly encouraged. At the completion of the rotation students will have a working understanding of the general role the pathologist plays within the greater context of patient care and will have gained insight toward consideration of pathology as a potential career choice.

PATH 5620. ACE: Anatomical Pathology. This four week Advanced Clinical Experience is designed to provide in-depth exposure to the practice of anatomic pathology via a mixture of services and is an ideal way to gain additional insight into the field for both those students considering pathology as a career and those who plan to pursue clinical specialties which frequently make use of pathology services. Depending on specific student interest and service availability, the setting for this clerkship may include the sub-specialty-oriented surgical pathology service at VUMC, the general surgical pathology service at the TVHS VA Hospital, the cytopathology service at VUMC, the pediatric surgical pathology service at Monroe Carell Jr. Children's Hospital at Vanderbilt, and the autopsy pathology service at VUMC. Emphasis is placed on introducing the student to the methods of specimen processing, evaluation and diagnosis in anatomic pathology with a particular focus on the relationship that anatomic pathologists maintain with clinical colleagues in the context of patient care efforts. Opportunities will exist for students to see a range of specimen types from fine needle aspiration biopsies to multi-organ resections and full autopsies. Students will work closely with pathology residents and fellows and will participate in a variety of tasks including pathologist performed biopsies, intra-operative consultations, gross specimen evaluation and selection of histologic sections for microscopic review. Additionally students will preview microscopic slides and dictate draft reports for selected cases and will subsequently participate in case review, ancillary test ordering/evaluation and final case sign out with the attending pathologist. Students will be expected to attend the various intradepartmental educational conferences in anatomic pathology as they occur.

PATH 5630. ACE: Clinical Pathology. Clinical pathology (also known as Laboratory Medicine) includes diverse laboratory services that provide diagnostic testing for all areas of medical practice. Services include transfusion medicine/blood bank, clinical chemistry, special chemistry (including toxicology), hematology and urinalysis, special hematology (bone marrow and lymph node analysis), coagulation, microbiology, virology, molecular infectious disease, molecular genetics, cytogenetics, and immunopathology (including flow cytometry). The student may rotate in one or multiple labs with training individualized according to their interest and future plans. Training consists of a mixture of observation and both didactic and case-based learning. At the end of the rotation, the student will have an understanding of efficient use and interpretation of diagnostic and monitoring tests in the areas of the lab through which the student has rotated.

PATH 5650. ACE: Clinical Microbiology. Medical microbiology is the subspecialty of pathology concerned primarily with the laboratory diagnosis, treatment, and control of infectious diseases. Medical students with an interest in medical microbiology, pathology, or infectious diseases may elect to do a rotation in medical microbiology. Formal training in medical microbiology at VUMC is administered by the Department of Pathology, Microbiology, and Immunology and consists of an integrated program of experiential and theoretical education in the laboratory diagnosis and management of infectious diseases. The program is designed to provide concurrent training in the technical, mechanistic, consultative, managerial, administrative, and

pedagogical aspects of clinical microbiology throughout the pathology residency period. Thus, medical students and pathology residents are placed in a learning environment that synthesizes the spectrum of clinical microbiology precepts within the daily routines and reinforces fundamental interconnections between clinical infections diseases, microbial pathogenesis, and laboratory diagnostic approaches. Further harmonization of concepts in medical microbiology is achieved via consistent, direct mentoring of trainees by program faculty, medical student and resident participation in conferences covering relevant topics in infectious diseases and diagnostic microbiology, and progressive increases in trainee responsibility commensurate with experience. The goal of individual rotations is to foster a detailed understanding by trainees of the biochemical, molecular, genetic, analytical, and engineering principles of contemporary testing methodologies and link these insights to the pathophysiology, clinical presentation, therapy, and prevention of microbial diseases.

PATH 5680. AE: Forensic Pathology. Join the Nashville Medical Examiner's Office for a month-long elective in one of the most fascinating areas of medicine, forensic pathology. Observe and participate in death-scene investigations, autopsies, and courtroom testimony. Learn about the important function a medical examiner's office plays in the protection of the public health of our community. This elective is not just for those who are interested in pathology, but also for all medical students who want to see how disease and trauma affect the human body. Prerequisite: Third year core clerkships. Fourth year students only.

PATH 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

PATH 7100. AWAY ACE: Pathology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

PATH 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Pediatric Medicine

PED 5020. Pediatrics Core Clerkship. Each member of the third-year class is assigned to pediatrics for five and one-half weeks. Three and one-half weeks are spent on the Children's Hospital inpatient pediatric wards. Students participate in all phases of diagnosis and treatment of a wide variety of illnesses of children and infants. Two and one-half weeks of the clerkship includes work in pediatric clinics or Meharry Hospital or community sites. Besides teaching rounds on the wards and nursery, student lectures are held three times a week. Grand rounds are held weekly, and chief resident rounds are held each Thursday.

PED 5310. Adolescent Medicine. Students will participate in an outpatient Adolescent and Young Adult Health Clinic with residents and faculty. The Adolescent clinic serves patients with a variety of health care needs including primary care, acute care, sports medicine, gynecological and contraceptive care, behavioral health, and eating disorders. Students will have the opportunity to see patients first and then work closely with faculty members to develop a care plan. Students can anticipate working in multidisciplinary teams and spending time with a variety of providers. Students can also expect to participate in didactic and case based learning sessions throughout the course. The goal of this elective is to familiarize students with the scope of adolescent health care. At the conclusion of the two-week elective, students will be able to take a complete and confidential psychosocial and gynecological history on adolescent patients. Additionally, students should be able to perform a focused physical exam and develop a patient plan of care in conjunction with the attending.

PED 5315. Pediatric Diabetes in the Clinical and Research Setting. Students will join a team of attending and fellow physicians and scientists as they learn about management and discovery in pediatric diabetes. The management of diabetes in children occurs at the intersection of medical and support services. The care is managed by physicians, nurses, social workers, child life specialists, and psychologists. Within this intersection of care, the team is also dedicated to improving the management of diabetes

through research. The goal of this short course is to introduce the students to this intersection. Students will participate in the initial evaluation and teaching of a patient with new onset diabetes, will be precepted in diabetes continuity clinic, and will attend clinical visits with dietitians, social workers, and psychologists. As an extension of this clinical exposure, students will learn about clinical research by attending our clinical research team meeting, receiving training in patient consent, and observing clinical trial visits. Students will also learn about the basic science of diabetes by participating in design, execution, and interpretation of research in the lab setting. At the conclusion of the elective, students will understand the presentation and management of diabetes through the contributions of a diverse provider team, the impact of diabetes on children and their families, and the opportunities for changing the course of diabetes through research from bench to bedside and back.

PED 5325. Physiology and Pathophysiology of the Newborn. This two-week elective will be scheduled for students who will be welcomed to the Neonatal Intensive Care Unit on the fourth floor of the Children's Hospital. The course will be a mix of didactic talks and readings as well as patient evaluations focused on the physiology and pathophysiology of oxygen delivery and gas exchange. The student will learn the principles of evaluation and treatment of a variety of cardiorespiratory disorders including respiratory failure, hyaline membrane disease, pneumonia, sepsis, various congenital heart diseases, and congenital malformations. The student will also be learning ventilation management and blood gas analysis and the basics of fluid, electrolyte, and nutrition management. These physiologic principles are universally applicable and not limited to neonatology. At the conclusion of the elective, students will be able to list five pathophysiologic mechanisms for hypoxic respiratory failure; interpret blood gases determining alveolar minute ventilation, acidosis status, and ventilatory means to correct abnormalities; write fluid electrolyte and parenteral nutrition orders demonstrating understanding of the reason behind including each component; and will understand the basics of physical examination and evaluation of the newborn infant and correlate the observations with the pathophysiology.

PED 5330. Pediatric Hematology-Oncology. Students will have a broad exposure to pediatric hematology-oncology on this rotation. The rotation is divided into two one-week blocks. Students will do one week each on the inpatient pediatric hematology-oncology service and the outpatient clinics. During the inpatient week, students will join a team of residents, fellows, and attending physicians on the pediatric hematology-oncology service at Vanderbilt Children's Hospital. Students will attend rounds and will see a broad range of both pediatric oncology and hematology diagnoses. Common reasons for oncology admissions are work-ups for possible oncology diagnoses, new diagnoses initiating treatment, chemotherapy administration, complications from treatment, and palliative care/death and dying. Common reasons for hematology admissions are diagnosis and management of bleeding disorders, workup for anemia and/or thrombocytopenia, and management of the complications of sickle cell disease. During the outpatient week, students will attend all hematology and oncology clinics in the outpatient setting. Clinic opportunities are vast and will include exposure to general oncology for routine chemotherapy and sick visits and benign hematology. New referrals will also be seen. Students may also attend subspecialty clinics to gain a general overview of specific diseases (e.g., brain tumors, sarcomas, hemophilia, and stem cell transplant). At the conclusion of the two week elective, students will be able to do a history and physical examination on an oncology patient in both the inpatient and outpatient setting. Students will also be able to formulate a differential diagnosis for a new patient referral, both in hematology and oncology. Students will have an overall appreciation for the varied patient populations seen in pediatric hematology-oncology from both the family and the physician/medical team perspectives. Students will also have a broad exposure to the field of academic pediatric hematology-oncology.

PED 5331. Pediatric Stem Cell Transplantation. Students will have a broad exposure to pediatric stem cell transplant on this rotation. Students will do a two-week rotation that includes both the inpatient and outpatient settings. During the inpatient time, students will join a team of fellows and attending physicians on the pediatric stem cell transplant service at Children's Hospital. Students will attend rounds and will see a patient at

all stages of stem cell transplant (pre-, peri- and post) for broad range of both pediatric oncology and nonmalignant diagnoses. Common reasons for admissions on this service are stem cell transplantation, complications from treatment, and palliative care/death and dying. During the outpatient time, students will attend all pediatric stem cell transplant clinics. Clinic opportunities are vast and will include exposure to patients who are being considered for stem cell transplant, post-transplant sick visits, and hospital follow-up. New referrals will also be seen. At the conclusion of the two-week elective, students will be able to do a history and physical examination on a stem cell transplant patient in both the inpatient and outpatient settings. Students will also be able to formulate a differential diagnosis for presenting signs and symptoms and to understand which patients are considered stem cell transplant candidates. Students will have an overall appreciation for the varied patient populations seen in pediatric stem cell transplantation from both the family and the physician/medical team perspectives. Students will also have a broad exposure to the field of academic pediatric stem cell transplantation.

PED 5335. Obesity Across the Life Stages: Before Breast Feeding to Bariatrics. Obesity is a condition of high prevalence worldwide. Most medical providers encounter it or one of its many co-morbidities on a daily basis. Its etiology is complex, with risk and disease development beginning before birth and progressing across the lifespan. In this elective students will be exposed to the evolution of this disease across these life stages, highlighting clear opportunities for prevention and treatment. Students will participate in a variety of clinical settings, which range from general to subspecialty, and from medical to surgical. Through these clinical experiences and a core of didactics, students will learn key points of intervention such as maternal nutrition (obstetrics), breastfeeding (newborn nursery lactation consultation), obesity treatment (multidisciplinary pediatric and adult weight management clinics, bariatric surgery), and management of its co-morbidities (lipid and endocrinology clinics). At the conclusion of the two-week elective, students will understand how obesity evolves across the lifespan, identifying opportunities for prevention and treatment; how to perform an obesity-specific assessment of patients of all ages through history taking, physical exams, and data interpretation; and how the multidisciplinary nature of treatment options can be approached through interpersonal interactions with patients, families, and members of the clinical teams.

PED 5340. Electronically-Engaged Pediatric Family Consult. This elective involves working as a consultant to engage pediatric patients and their families in managing their health through information technologies. Students will work with a variety of pediatric providers in the inpatient, outpatient, and acute care settings. Consultations will focus on educating and supporting families with new diagnoses and chronic illnesses using mobile devices, the MyHealthAtVanderbilt patient portal, or other technologies to assist with disease monitoring or behavior change. With each new consultation, students will independently evaluate the patient and family, present the case to a multi-disciplinary team, explore technologies to address the information and disease-management problems, and work with the family to implement the proposed solutions. Students may also have opportunities to provide follow up from prior consultations and to participate in ongoing research studies of patient engagement through information technologies. At the end of this rotation, the student will have a familiarity with the roles of information technology in health and disease management, as well as the importance of literacy, numeracy, and computer skills in facilitating patient engagement.

PED 5345. Pediatric Cardiology. Students participating in this two-week elective will be exposed to the breadth of services offered by the medical and surgical teams caring for children with congenital and acquired heart conditions. Selected faculty members and at times senior cardiology fellows will provide didactic and clinical insight relative to their area of expertise. Such areas include but are not limited to noninvasive imaging (echocardiography, MRI), cardiac catheterization, and electrocardiography- the primary areas whereby cardiac structure, hemodynamics and rhythm are assessed. The goal is to provide consistent core didactics and readings, supplemented with an introduction to basic cardiac assessment in the outpatient and inpatient settings. Students will be afforded an opportunity to observe the interaction of multiple team members working toward the optimal patient care plan using a variety of diagnostic and

imaging modalities. At the conclusion of the elective, students will have acquired a basic understanding of how abnormalities of cardiac structure and function impact the well-being of the pediatric patient through the care continuum. Though many principles are pediatric-specific, common concepts are shared with adult medicine as well. Students will also understand basic cardiac assessment in the infant, child and adolescent, primarily in the outpatient setting including history, physical exam, and appropriate use of diagnostic studies.

PED 5611. AI: Pediatric Medicine. The pediatric acting internship is a course designed to give students a more robust experience of serving as an active member of the inpatient pediatric ward teams. Students will assume intern responsibilities with the supervision and countersignature of notes and orders by upper level residents, as well as participate in daily teaching conferences. Students will be assigned a number of long day shifts and a series of night shifts, with a maximum of four days off during the four week period. Patient assignments will be at the level of a census closer to that of an intern to provide increased responsibility and ensure readiness for residency. In order to ensure the strong clinical experience which characterizes this course, each position is built into the pediatrics house staff rotational schedule. Therefore, the pediatric service relies heavily on each student who is accepted into this course. We ask that each student consider his/her enrollment as a strong commitment to serve; add/drops will not be permitted.

PED 5612. ACE: Adolescent Medicine. Adolescent medicine is a unique subspecialty in pediatrics in that it combines both primary care with consultative care for adolescents and young adults ages 12 to 22 years of age. During this ACE, students will have the opportunity to learn comprehensive care of the adolescent using both a primary care and a multidisciplinary team approach. Students will have the ability to function within the Adolescent/Young Adult Clinic and will be exposed to a multidisciplinary team which includes a social worker, nutritionist and psychiatrist in conjunction with an adolescent medicine physician. At the end of the course, students will feel comfortable performing a complete psychosocial assessment of an adolescent using the HEADDSS assessment tool. They will have the opportunity to provide primary and basic gynecologic care for adolescents to include (1) how to perform a sports clearance exam; (2) how to take an appropriate menstrual history and screen for menstrual disorders; (3) how to take an appropriate sexual history; (4) how to counsel an adolescent on contraception. Students will also gain experience in the care of adolescents/young adults with eating disorders and major depression. Evaluations will be based on the student's ability to take a complete and appropriate history/physical and develop a cohesive and appropriate treatment plan. This course will fulfill the primary care requirement.

PED 5615. ACE: General Pediatric Neurology. Students will participate in a four-week Pediatric Neurology Advanced Clinical Experience with a flexible schedule that will allow students to pursue specific interests. Given student interests, the schedule will be individually tailored through discussion/planning with the ACE director and involve participation in the following venues: outpatient pediatric neurology clinic and the inpatient teams encompassing pediatric neurology, pediatric epilepsy, and critical care.

PED 5620. ACE: Pediatric Epilepsy. Pediatric Epilepsy Advanced Clinical Experience (PEACE) is an exciting multi-disciplinary specialty that encompasses pediatric neurology, neurosurgery, neuroradiology and neuropathology. Patients present with seizure onset ranging from birth into young adulthood. While due to many etiologies, most patients do well with standard medications achieving excellent seizure control. However, a substantial subset requires additional evaluations as well as dietary or surgical approaches. PEACE students will function within inpatient and outpatient clinical teams, as well as participate in divisional teaching conferences and also learn basic EEG reading skills. PEACE students will (1) deepen their understanding mechanisms causing epilepsy in children, (2) learn the basic principles of EEG reading and medical management of epilepsy in children, and (3) participate in multi-disciplinary evaluations of patients with epilepsy and participate in neurosurgical assessments and procedures.

PED 5625. ACE: Technology-based Engagement Consultation. Students in this course will participate in patient and family engagement consultations for children and adults admitted to the Monroe Carell Jr. Children's Hospital at Vanderbilt (VCH) and Vanderbilt University Hospital.

The purpose of this ACE is to provide the student with an understanding of the importance of patient and caregiver engagement for optimal health and healthcare, knowledge about the developmental process of patient and caregiver activation, and experience with recommending educational and technological interventions to promote engagement and meet health-related needs. Participation in inpatient consultations will facilitate training in promoting engagement in pediatric and adult patients with a wide variety of clinical diagnoses. Didactic experiences that will reinforce the patient care experiences include our weekly multidisciplinary Patient and Family Engagement Consultation Team Meeting, weekly Biomedical Informatics Seminar, and clinical conferences relevant to the patients being seen in consultation.

PED 5635. ACE: Pediatric Hematology/Oncology. Once students have finished this ACE, they will have a better understanding of the pathology, treatment, and survival of common childhood cancers. They will also gain experience in working up and treating anemias and bleeding disorders. These objectives are accomplished through a combination of inpatient time and outpatient time. Half of the course will be on the inpatient service where the students will be expected to follow their own patients, present on rounds, write daily progress notes, and prepare a short 10-15 minute discussion of a patient of interest. The student should also participate in walk rounds with the fellow and faculty for more informal discussion. The other half of the course will be in the outpatient clinic. While there, the student will see both new patients and patients returning for therapy. The student will take a history from the family, perform a physical exam, interpret lab tests, present these patients to the faculty, and write notes. The student will also have the opportunity to attend "specialty" clinics to see a group of patients with a focused set of problems (for example sickle cell clinic).

PED 5680. ACE: Pediatric Cardiology. The Advanced Clinical Experience in Pediatric Cardiology is a four week course that aims to expose medical students to the broad spectrum of cardiac disease in children. The students will spend two weeks on the inpatient service getting exposure to acute cardiac disease and their care during perioperative period. Students will be responsible examining patients, presenting in rounds, and participating in the team care of the patients. An additional two weeks will be spent focusing on the outpatient side of cardiology. The student will participate in a variety of different cardiology outpatient clinics. Throughout the experience, the student will have the opportunity to accompany the inpatient cardiology fellow on inpatient consults. There will also be opportunity to watch cardiac catheterizations, watch a cardiac surgery, and spend time in the echocardiography laboratory.

PED 5690. ACE: Pediatric Endocrinology. Pediatric Endocrinology is a wonderful sub specialty of Pediatrics which involves studying about and caring for patients who have abnormalities involving hormonal regulation of basic body systems. Students will study physiology, pathology, molecular biology, genetics and pharmacology during the time they care for these patients. Some examples of endocrine disorders they will be expected to learn about will include: growth and pubertal disorders, disturbances in calcium homeostasis, hypo and hyperthyroidism, adrenal disorders, some disorders of sexual development and common disorders of glucose regulation. Students will also learn about how to manage acutely ill pediatric diabetes patients in the hospital setting and they will learn the fundamentals of chronic, out-patient diabetes management. Under the supervision of the endocrine attending physician, students will see patients in the outpatient endocrine and diabetes clinics, and they will be an integral part of our ward team on the inpatient endocrine service.

PED 5710. ACE: Pediatric Gastroenterology. The Pediatric Gastroenterology Advanced Clinical Experience (ACE) provides exposure to a broad range of gastrointestinal, nutritional, and liver diseases in both the inpatient and ambulatory settings. Students will have the opportunity to observe and participate in outpatient evaluations of infants and children referred to the pediatric gastroenterology clinic under the direct supervision of faculty attending pediatric gastroenterologist, attend endoscopic procedures, participate in inpatient pediatric gastroenterology inpatient care and consults, and attend scheduled divisional didactic conferences. The rotation provides students with experience in the workup of common pediatric symptom complexes such as abdominal pain, vomiting, diarrhea, jaundice, and many other common complaints, as well as the opportunity to participate in multidisciplinary care of complex gastrointestinal disorders such

as inflammatory bowel disease and chronic liver disease. Attendance in the endoscopy suite allows familiarity with esophagogastroduodenoscopy, colonoscopy, polypectomy, and rectal suction biopsy. The rotation will include core reading on the pathophysiology and management of important gastrointestinal diseases such as inflammatory bowel disease, biliary atresia, and short bowel syndrome. The student will prepare one in-depth talk on a gastrointestinal topic of their choice and receive feedback from the attending on the content and delivery.

PED 5720. ACE: Pediatric Nephrology. Pediatric Nephrology is an exciting specialty that functions at the intersection of renal physiology, pathology, anatomy, genetics, pharmacology, and immunology. Students who participate in this Advanced Clinical Experience will actively participate in the evaluation and management of patients who demonstrate the consequences of alterations in renal development and the genes that direct development. Students will have the opportunity to see in inpatients and outpatients with acute and chronic alterations in renal physiology including those with acute kidney injury, hypertension, glomerulonephritis, and chronic kidney disease in addition to those with congenital abnormalities of the kidney and urinary tract. Advanced understanding of renal physiology and pathophysiology will be an asset in any career path, because the kidney controls homeostasis for the entire body.

PED 5730. ACE: Child Abuse Pediatric Medicine. Child abuse pediatrics is a pediatric subspecialty like no other, combining medicine, community, and the judicial system. Students who participate in this Advanced Clinical Experience will have the opportunity to be a part of the Child Abuse Evaluation and Response Team based at Monroe Carell Jr. Children's Hospital at Vanderbilt. In addition to participating in medical evaluations of children referred for possible abuse and/or neglect, students will also be able to observe court testimony, attend forensic interviews, participate in multidisciplinary meetings with DCS and law enforcement, and shadow a DCS case worker for a day. Students will have the opportunity to (1) learn to perform a basic child abuse evaluation, including taking a thorough history and performing a full physical exam with photography; (2) learn the importance of injury biomechanics; (3) and have a better understanding of the biopsychosocial aspects of child abuse.

PED 5740. ACE: Pediatric Pulmonary Medicine. Students in this course will participate in consultations on children referred for evaluation of lung disease in the hospital and in the outpatient clinic. The purpose of this ACE is to provide the student with expertise in the clinical evaluation of pulmonary disease in infants, children, and adolescents, and students will gain expertise in the relevant history, physical exam findings, and diagnostic testing used in a pulmonary evaluation. Participation in multi-disciplinary clinics in cystic fibrosis, bronchopulmonary dysplasia, and asthma will facilitate training in caring for children with chronic lung diseases. Didactic experiences that will reinforce the patient care experiences include our weekly Pediatric Pulmonary Imaging Conference, our weekly Pediatric Pulmonary Core Curriculum Conference, and other monthly conferences that constitute our fellowship training program. Students will have the opportunity to participate in bronchoscopies.

PED 5750. ACE: Pediatric Rheumatology. Students will participate in the evaluation and care of children referred to the pediatric rheumatology program at Children's Hospital. The experience will involve direct interactions with patients and their families in both the inpatient and outpatient settings. Students will also have the opportunity to participate in divisional conferences in which patient cases and radiographic studies are discussed, and recent journal articles are reviewed. Over the course of the month, the student will gain an understanding of the presenting symptoms, exam findings, and laboratory studies of autoimmune diseases in children, as well as current treatment strategies. Through these clinical experiences, the student will gain insight into the impact of chronic disease on children and their families. The clerkship will also afford the student a unique opportunity to gain experience with the fundamentals of the musculoskeletal exam, which has broad application outside of rheumatology. Prerequisite: Pediatrics 5020. Fourth year.

PED 5760. ACE: Spanish Language Pediatric Clinic. Demographics in the U.S. are changing, and Latinos are now the fastest and largest growing minority group in the United States. Students need to be prepared to provide effective care to Spanish-speaking population. This ACE offers students the

opportunity to function within the primary care pediatric clinic as they participate in well-child visits and acute visits for Spanish speaking families, and exposes students to community resources that are targeted to this population. The course will focus on (1) enhancing students' fluency in Spanish; (2) learning appropriate medical terminology for developmental screening, anticipatory guidance, and explaining disease processes; (3) learning about the immigrant experience (immigration process, barriers to access to care, education and culture); and (4) exploring various views of disease within this population, including alternative health beliefs, use of alternative medicines and therapies, and traditional interaction with medical professionals. In addition, students will be expected to participate in a small project.

PED 5800. ACE: Developmental Pediatrics and Genetics. The combined Developmental Pediatrics and Genetics ACE will blend two specialties that are important in all facets of pediatric medicine. This course is primarily an outpatient experience that allows students to assess and diagnosis children who have developmental and genetic concerns. Students will work within multidisciplinary teams and have the opportunity to learn the roles of other medical providers that their patients might work with including therapists, psychologists, genetic counselors, nurse practitioners, and dietitians. During the genetics portion of the course, students will assist in diagnosis and managing children with complex genetic diseases. Students will have the opportunity to (1) deepen their knowledge of genetic conditions including dysmorphology, biochemical genetics, single gene disorders, and chromosomal disorders; (2) assess family histories; (3) participate in the medical intake that can help lead to a diagnosis; and (4) learn resources they can use throughout their career when working with patients with genetic conditions. During the developmental pediatrics portion of this course, students will start to become familiar with typical and atypical courses of childhood development. The goal of this rotation is to teach medical students how to (1) take a developmental history, (2) assess how a child is functioning currently, (3) understand what interventions that are likely to help the child make developmental progress, and (4) be familiar with certain developmental disabilities that are common in our society, including Autism Spectrum Disorders and Down Syndrome.

PED 5815. AI: Neonatology. Neonatologists care for newborns with a wide variety of conditions, ranging from prematurity to surgical conditions, infections to congenital cardiac disease, and respiratory distress to genetic disorders. Students in this rotation will work in the Children's Hospital Neonatal Intensive Care Unit on the Red Team. The Red Team cares for patients primarily with congenital heart disease, surgical and genetic disorders. This team does not attend deliveries. The AI will provide care for 3–5 patients with a wide range of conditions. The AI will be expected to pre-round on all patients, write orders and assist with TPN orders, review X-rays and lab results and contact and interact with consultants. He or she will be required to write History and Physicals, Daily Progress Notes, and Discharge Summaries. This is a high intensity AI with very complex and sick infants and is only recommended for the highly motivated and extremely responsible AI with an interest in neonatal medicine. It is best suited for the student considering a career in neonatology or pediatric critical care or a another pediatric subspecialty. Schedule is 6 a.m.–6 p.m. six days per week. There is no overnight call. Days off are scheduled with team members upon starting the rotation. Daily multi-specialty rounds starts with both cardiology and NICU attendings at 8:30 a.m. Required lectures are Monday, Wednesday and Thursday mornings at 7:45–8:15 a.m. and weekly simulation sessions are generally on Fridays 7:45–8:30 a.m.. Topics which will be covered and which the AI must read about include: respiratory distress syndrome, ventilator management, surgical conditions in the newborn, congenital heart disease in the newborn, nutrition of the premature infant, apnea of prematurity, jaundice and anemia in the newborn. The AI must set up biweekly review with his or her NICU attending at beginning of rotation to review written notes and daily performance. He or she will also be required to give a weekly brief talk to the team on a relevant topic of choice. Recommended reading is Fanaroff and Martin's *Neonatal-Perinatal Medicine*, which is available through the digital library. Volume 2 contains the conditions by organ system.

PED 5830. ACE: Pediatric Emergency Medicine. Pediatric Emergency Medicine physicians need to be prepared to care for minor ailments to life-threatening events. The Pediatric Emergency Department rotation will expose students to a wide variety of patient pathology in a fast-paced setting. Students will simultaneously obtain a history and perform a physical

exam on pediatric patients from newborn to adolescence. Under the direct supervision of attendings, fellows and senior residents, students will exercise critical thinking and develop differential diagnosis, management and disposition for pediatric patients presenting with medical illnesses, surgical workups, traumatic injuries and psychiatric issues. The course will focus on common infectious diseases, pediatric surgical/orthopedic emergencies and toxicology emergencies. The student will increase their communication skills with children, families, consultants and emergency medicine staff. Students will participate under supervision in common procedures in pediatric emergency medicine such as suturing, sedation, and splinting of extremity injuries. Students work fifteen, 8-hour shifts which may include weekends and overnights. Students may also participate in weekly fellow conferences as well as journal clubs and simulation scenarios. Fulfills the acute care course requirement.

PED 5910. ACE: Pediatric Infectious Diseases. The Pediatric Infectious Diseases (PID) Advanced Clinical Experience (ACE) provides students the opportunity to evaluate and participate in the management of children with a wide range of suspected or proven infectious diseases. The PID rotation allows the learner to gain experience in the workup of common symptom complexes such as prolonged fever, joint pain / limp, respiratory illnesses, rash, and many other common pediatric presentations. The rotation also provides valuable experience in the pharmacology and pharmacodynamics of antimicrobial agents, as well as the proper use and potential adverse effects of these commonly prescribed drugs. The rotation will include core reading on the pathophysiology and management of infectious diseases such as meningitis, osteomyelitis, and pneumonia. Students will actively participate in the evaluation and management of children on the PID service in both the ambulatory and inpatient settings.

PED 5990. ACE: Pediatric Critical Care. Pediatric Critical Care is an exciting specialty that cares for the sickest patients from birth into young adulthood. The Pediatric Intensive Care Unit (PICU) and the Pediatric Cardiac Intensive Care Unit (PCICU) both offer unique blends of physiology, pharmacology and pathology in disease processes ranging from sepsis, respiratory failure, and traumatic brain injury to congenital heart disease and its repair. Students will have the opportunity to function within the PICU and/or PCICU clinical teams, as well as participate in divisional teaching conferences. The course will focus on enhancing student clinical practice-based learning skills. Students will have the opportunity to (1) deepen understanding of the complex pathophysiology of critically ill children, (2) learn the basic principles of multidisciplinary management and resuscitation of critically ill children, and (3) review common diseases seen in a busy pediatric critical care unit. Additionally, students will be expected to stay for overnight call at least four times during the four-week rotation. This course will fulfill the acute care requirement.

PED 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

PED 7100. AWAY ACE: Pediatrics. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

PED 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Preventive Medicine

PM 7100. AWAY ACE: Preventative Medicine. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Physical Medicine and Rehabilitation

PMR 5310. Principles of Physical Medicine and Rehabilitation. This course is designed to provide exposure to the practice of physical medicine and rehabilitation (PM&R) with an emphasis on musculoskeletal and neurological rehabilitation. Many of these patients have had acute illness, trauma, surgical procedures, and prolonged hospitalization and require

inpatient and/or outpatient rehabilitation. The student will be asked to participate in a series of introductory lectures as well as rounds, clinics, and case discussions. The attending physician on the PM&R service will define participation in patient care. The student will be expected to participate in the evaluation of individuals with significant impairment and disability such as spinal cord injury, traumatic brain injury, stroke, amputations/complex fractures, multiple trauma and general debility. Outpatient clinics are available to expose students to the long-term problems which these patients encounter. At the conclusion of the two weeks, students will be able to take a PM&R oriented history; perform a physical examination with an emphasis on functional status and disability; formulate rehabilitation goals; and understand the importance of rehabilitation as part of the post-acute care continuum.

PMR 5611. ACE: Introduction to Physical Medicine and Rehabilitation. Hands-on exposure to the practice of physical medicine and rehabilitation (PM&R) with an emphasis on musculoskeletal and neurological rehabilitation is offered in this course. Many of our patients have had acute illness, trauma, surgical procedures, and hospitalization and the student will have an opportunity to follow the patients post-acutely. The primary responsibility is the care of those patients with spinal cord injury, stroke, amputations/complex fractures, multiple trauma, traumatic brain injury, and general debilitation. The attending physician on the PM&R Service will define participation in patient care. The student will be expected to (1) participate in the evaluation, functional diagnosis, and treatment of individuals with significant impairment and disability who require long-term hospitalization to achieve maximal independence and (2) Integrate medical and surgical knowledge in the care of patients in the hospital for rehabilitation and in the outpatient clinic. Additionally, adult and pediatric outpatient clinics are available to expose students to the long-term problems which these patients encounter.

PMR 7100. AWAY ACE: Physical Medicine and Rehabilitation. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

Psychiatry

PSYCH 5020. Psychiatry Core Clerkship. Basic goals of this clerkship which includes psychiatry clinical rotations are to learn the fundamental techniques of psychiatric assessment, differential diagnosis, and treatment intervention. Activities include direct patient care and clinical rounds in the company of assigned faculty. The five 1/2-week placements include Vanderbilt University Hospital and Vanderbilt Psychiatric Hospital (Adult/Adolescent/Child).

PSYCH 5310. Introduction to Addiction Psychiatry. This two-week elective will offer students an opportunity to join a team of physicians on the Addiction Psychiatry service at Vanderbilt Psychiatric Hospital (VPH). The clinical team will be caring for patients admitted to the hospital for detoxification, diagnosis, and psychiatric stabilization and treatment planning. As substance use disorders often co-occur with depression, bipolar illness, organic brain disorders, and anxiety disorders (especially post-traumatic stress disorders, sometimes with sexual and eating disorders), the addiction psychiatry experience will expose students to a variety of common psychiatric problems. Students will be interacting with inpatients, learning about detoxification protocols, as well as seeing patients in follow up outpatient addiction clinics. Students may sit in on treatment groups for opiate dependent patients and attend a nearby Narcotics Anonymous support meeting. At the conclusion of the elective, students will be able to take a psychiatric history, perform a mental status examination, and know the basics of case formulation. Additionally, students will have familiarity with evidence-based approaches to care, understanding the role of an addiction psychiatrist as well as how addiction may present to physicians practicing in many specialties of medicine and surgery.

PSYCH 5620. ACE: Neuropsychiatry. This advanced clerkship (elected after completing rotations in both neurology and psychiatry) is an introduction to clinical practice and research at the interface of psychiatry and neurology. Under supervision, the student will examine patients with psychiatric and neurologic diseases affecting emotions, such as temporolimbic epilepsy, frontal lobe lesions, strokes in the non-dominant hemisphere, or

degenerative conditions such as Alzheimer's disease, Parkinson's disease, vascular dementia, and Huntington's disease. Readings will focus on the neurology of emotion, including functional neuroanatomy, experimental neuropsychology, and electrophysiology. The student may participate in research protocols involving quantitative behavioral assessment, autonomic measures, and structural and metabolic imaging of the brain. Each experience in this clerkship is unique and will be tailored to the specific interests of the student. Consequently, we can only accept one student per rotation.

PSYCH 5625. ACE: Child and Adolescent Psychiatry Consult-Liaison.

This advanced clerkship is an introduction to clinical practice as a consultation liaison psychiatrist working with children and adolescents. Under supervision, the student will examine patients with psychiatric diseases complicating pediatric management including delirium, catatonia, anxiety and mood disorders both complicating pediatric illness and mimicking pediatric illnesses (somatoform disorders), management of chronic pain in collaboration with the pediatric pain team, acute stress and post traumatic stress disorder on the trauma service and in the intensive care unit, and psychiatric consultation regarding eating disorders. Readings will focus on the neurobiology of trauma and the neurobiology of the interface between emotions and physical disorders. The student may participate in research studies if available at that time.

PSYCH 5635. ACE: Emergency Psychiatry. In the Psychiatric Treatment Unit, the student will see a broad range of acute psychiatric and neuropsychiatric disorders. Commonly encountered conditions include delirium, dementia, depression, suicide attempts, capacity evaluations, agitation management, altered mental status, conversion disorder, addictions, and somatoform disorders. This is similar to the population on the Consultation-Liaison service, but with greater acuity and a focus on disposition. The student will work closely with the primary resident providing coverage with supervision to the team by the attending. Students will also see psychiatric consults in the VUMC Emergency Department and OB-GYN triage. Patients will be above the age of 18.

PSYCH 5638. ACE: Outpatient Psychiatric Clinics. Students will become primarily active contributors to evaluation and treatment clinics in adult outpatient psychiatry under the direct supervision of Dr. Bill Petrie. Students will have the opportunity to work closely with Dr. Petrie in both inpatient and outpatient settings, treating a wide variety of psychiatric illness. Sessions sitting in on psychotherapy with Linda Manning at VCIH are also available. Students will work individually and in treatment teams, observing and learning the basics of outpatient psychiatric evaluation, psycho-pharmacology and psychotherapy (particularly psycho-dynamic formulation and the principles of insight-oriented therapy and CBT). The course will also include didactic teaching, case presentations, treatment planning, chart review and group supervision.

PSYCH 5639. AI: Inpatient Child and Adolescent Psychiatry. Students will provide inpatient psychiatric care for children and adolescents aged 4 to 18 in a multidisciplinary setting. This course offers the opportunity to take full ownership for patient care in direct collaboration with the attending physician. Students will carry a case-load of patients intended to prepare them for their future role as residents. Duties will include completion of daily documentation including admission/discharge/daily notes, order entry, and patient cross-cover. Students can expect to see a varied range of ages, diagnoses, and presenting complaints. Feedback will be provided to ensure readiness for residency.

PSYCH 5641. ACE: Inpatient Treatment of Psychosis. Psychosis (i.e., delusions, hallucinations, disorganized thought and behavior) is a cardinal feature of several psychiatric disorders. This Advanced Clinical Experience gives the student hands-on exposure to inpatient treatment of patients with psychotic disorders. Students will work closely with resident and attending physicians to develop differential diagnosis and treatment plans. Treatment in this inpatient setting centers on stabilization of acute and severe illness. Students will be responsible for following several patients. Assigned readings supplement patient care experiences.

PSYCH 5645. ACE: Adult Psychiatry Consult-Liaison. The Adult Psychiatry Consultation service at VUMC provides psychiatric services for a broad range of patients with psychiatric and neuropsychiatric disorders in the context of medical, surgical, and obstetric (and other) inpatient settings

at Vanderbilt University Hospital and Stallworth Rehabilitation Hospital. Our service is one of the busiest in the country and offers an opportunity to see the intersection of psychiatric conditions with medical illness. Commonly treated conditions include delirium, dementia, depression, anxiety, suicide attempts, substance withdrawal, conversion disorder, somatic symptom disorder, and factitious disorder. Regardless of the diagnosis, we also help with agitation management and capacity evaluation. The sub-intern will become an integral part of the team, with assigned primary focus on the care of a discrete set of patients, and will be directly supervised by psychosomatic medicine fellows and psychiatry attendings. A practical focus on areas of special interest to the student may be arranged.

PSYCH 5655. AI: Addiction Psychiatry. Alcohol and other substance use disorders are extremely common in primary care and across a broad range of medical specialties. These conditions lead to direct medical and psychiatric co-morbidity, predispose to a host of associated conditions (e.g. cancer, cirrhosis, physical and emotional trauma, infections, and mood disorders), and complicate management of medical and surgical conditions. The mission of this AI in substance use disorders is to help provide future physicians with the fundamental clinical skills necessary to properly diagnose, treat, and refer patients with substance abuse disorders.

PSYCH 6100. Special Clinical Study—Vanderbilt. A variety of opportunities are available for clerkships and electives in the Department of Psychiatry that can be combined, especially where daily continuous patient care is not essential to work flow. In addition to the standard rotation sites, other experiences can be arranged. Two or three experiences can be combined within a single elective month. These may include a mixture of areas within and outside the listed standard electives, such as forensics, geriatric psychiatry, and brain imaging research. Opportunities will be arranged to meet the interests of the individual student, potentially blending topics to provide exposure to two to three of these areas. Faculty approval is recommended at least two months prior to the start of the month's rotation in order to develop a plan optimal to meeting the student's interests. Approval required.

PSYCH 7100. AWAY ACE: Psychiatry. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

PSYCH 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Radiology

RAD 5310. Introduction to Interventional Radiology. Students will join a team of attending, fellow and resident physicians on the Interventional Radiology service at Monroe Carell Jr. Children's Hospital at Vanderbilt. Interventional radiology involves working as a consultant to the physicians who are caring for patients admitted to the hospital as well as performing a multitude of outpatient procedures. Reasons for consultation requests vary, but some of the more common ones include arteriography, CT-guided biopsy of lesions, implantation of infusion devices, and external drainage of infectious processes. With each new consultation request, students will have the opportunity to research the patient using StarPanel and then present the case to the team during morning rounds. The student will then be able to perform a history and physical on patients as they get prepared for their procedure. The student will then participate in the procedure and provide follow-up care as needed with the supervision of the resident and attending physicians. At the conclusion of the two-week elective rotation, students will be able to understand the role Interventional Radiology plays in the care of both inpatients and outpatients. They will have a basic understanding of the breadth of procedures offered, and the indications, complications, and post procedural care for the most common procedures. Additionally, the students will have familiarity with evidence-based approaches to care.

RAD 5315. Radiology Elective. The course will provide students with a broad exposure to the various specialties of radiology and will provide focused training on basic chest x-ray interpretation. The students will spend each morning in a different reading room within the department. The

students will sit with the faculty, fellows, and residents on the service and observe them interpreting the various studies that are read or performing the various procedures that are done. For each reading room, there will be a series of five or so "check-offs" which consist of bits of information that the student must learn in that reading room (for example, "What is the appropriate follow-up of an incidentally-discovered pulmonary nodule?"). The afternoons will be spent attending didactic lectures and participating in the focused chest x-ray "boot camp." Each afternoon there will be a one-hour lecture on one of the different radiology sub-specialties. Students will use the knowledge gained in the didactic session along with content from the boot camp handout to work through the various chest films with the course director. Each day the films will be slightly more difficult than the day before. At the conclusion of the elective, students will know the various imaging modalities and the role they play in the diagnosis of disease and management of patients; the numerous procedures performed by radiologists and their role in patient care; and how radiologists participate as active members of multidisciplinary health care teams in caring for patients. Students will develop skills and confidence in the interpretation of plain chest x-rays, particularly for common and major abnormalities.

RAD 5320. Musculoskeletal and Emergency Radiology. Students will spend two weeks in the musculoskeletal/ emergency radiology reading room. It's a bustling place where MSK-subspecialty trained radiology faculty, MSK fellows, and radiology residents interpret musculoskeletal studies and selected studies performed in the Emergency Department, as well as provide consultation services to a variety of physicians (emergency, trauma team, general surgery, orthopaedic surgery, infectious diseases, internal medicine, rheumatology, etc.). Students will be exposed to a broad spectrum of musculoskeletal pathology including trauma, athletic injuries, arthritis, infection, neoplastic conditions, expected post-operative changes, and post-operative complications. Imaging modalities will include conventional radiographs, Magnetic Resonance Imaging, Computed Tomography and, possibly, ultrasonography. Students will have the opportunity to observe interventional procedures such as fluoroscopically-guided arthrography and CT/US-guided biopsies. In addition to daily teaching at the PACS monitors using live cases, there will be didactic lectures/ case presentations written specifically for this course focusing on trauma, sports injuries, arthritis, and the basics of musculoskeletal neoplasms. The advantages and limitations of the various modalities utilized will be emphasized. The didactic component of the elective will be further enhanced by daily noon radiology conferences. The course will be of particular interest to students contemplating careers in radiology, orthopaedic surgery, sports medicine, and emergency medicine; however, any student interested in learning more about the musculoskeletal system or radiology is encouraged to attend. At the conclusion of the two-week elective rotation, students will be able to accurately describe fractures, have an organized approach to diagnosing arthritis, recognize significant athletic injuries on MRI, have a basic understanding of the concept of aggressiveness of musculoskeletal neoplasms, and have an understanding of the strengths and limitations of the modalities used by radiologists in diagnosing a variety of conditions.

RAD 5610. ACE: Diagnostic Radiology. Students will rotate through all diagnostic subspecialties in radiology, getting a broad exposure to various pathologies and imaging modalities. The purpose of this course is to acquaint medical students with the fundamentals of diagnostic imaging and to highlight optimal imaging pathways for various clinical conditions. Other key topics such as ionizing radiation risks, contrast media, the strengths, limitations, and relative costs of the various imaging modalities, management of equivocal findings and negative examinations, the importance of open communication between clinicians and radiologists, and basic use of the PACS workstation will be covered as well. The course is designed to be relevant and suitable for all medical students, regardless of their ultimate career choice or interests; this course is not designed solely for students interested in pursuing a career in radiology. Besides getting daily instruction in the reading rooms by faculty, fellows, and residents, students will be engaged in a number of other educational activities. Students will watch Radiology faculty lecture podcasts on various topics, complete reading assignments, attend live lectures presented by radiology residents, attend daily Radiology noon conferences, solve weekly unknown case challenges, and prepare a final "unknown case" presentation. The course has a pre-test and a final exam.

RAD 5630. ACE: Pediatric Radiology. This course will introduce the medical student to the principles of diagnostic imaging in a children's hospital setting. The medical student experience consists of interactive reading room sessions covering all diagnostic imaging modalities, such as radiography, fluoroscopy, computed tomography (CT), MRI, nuclear medicine, and subspecialties in pediatric radiology such as neuroradiology and interventional radiology. The students have the opportunity to attend radiology teaching conferences and many interdisciplinary conferences which highlight imaging. In addition, we offer a host of self directed activities outside the reading room, such as recommended reading assignments, learning modules, and teaching files. The successful student will learn the radiologist role in the care of the patient and how to interact with radiologists, as well as the appropriate work up of common pediatric conditions. The importance of the clinical question in the role of choosing the best and most appropriate diagnostic imaging studies is emphasized.

RAD 5640. ACE: Neuroradiology. The month will allow a broad exposure to the field of neuroradiology with a strong focus on review of clinically relevant neuroanatomy. The primary role of the student will be as an observer, working alongside residents, fellows and faculty as imaging studies are interpreted and procedures are performed. Students will be responsible for delivering a single informal presentation during the month. Prerequisite: ISC: Medical Imaging and Anatomy or ACE: Diagnostic Radiology

RAD 5650. ACE: Adult Interventional Radiology. Interventional radiology is an exciting, fast paced, advanced specialty performing minimally invasive procedures on virtually every organ in the body. This course provides an immediate immersion into the daily life of an IR. You will be involved in every aspect of treating patients, including outpatient clinic visits, researching and working up the patient the day of the procedure, presenting the patient in morning rounds, consenting and performing physical exams, scrubbing in on the procedure, admitting and post procedural care, inpatient rounds, and long term follow-up. You will also have the option to visit other specialty areas of IR, including Pediatric IR, the One Hundred Oaks Vein Center, and read CTA/MRA with our noninvasive vascular specialists. You will be required to research and present one case report while on the service. The typical day lasts from 7 am to 6 pm and there are no call responsibilities. Typical procedures include angioplasty and stent placement in the arteries and veins, embolization of bleeding, embolization of tumors, uterine fibroid embolization, bronchial artery embolization, gonadal vein embolization, chemo-embolization, percutaneous treatment of tumors (ablation), placement of nephrostomy, biliary, gastrostomy, venous catheters, and TIPS.

RAD 5710. ACE: Visiting Diagnostic Radiology. The Visiting Diagnostic Radiology Elective in diagnostic radiology is designed for medical students interested in pursuing a career in radiology. The goals of the course are to acquaint medical students with the fundamentals of diagnostic imaging and to highlight optimal imaging pathways for various clinical conditions. Students will rotate through several diagnostic subspecialties in radiology and get a broad exposure to various pathologies and imaging modalities. Daily instruction will be provided by faculty, fellows, and residents.

RAD 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work at Vanderbilt. Approval required.

RAD 7100. AWAY ACE: Radiology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

RAD 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

physical. This will be presented to the resident who will then review these findings directly with the attending. The team (resident/attending/student) will then discuss treatment options with the patient and formulate a treatment plan. At the conclusion of this course students will be able to take a focused oncologic history, perform a pertinent exam, and understand the basics of diagnosis, staging, and treatment options for cancer patients. They will learn about the multidisciplinary nature of oncologic care.

RADO 5620. ACE: Radiation Oncology. This four-week clinical rotation in radiation oncology is designed for students who are interested in pursuing a career in radiation oncology. Students are integrated into the clinical workflow. They are assigned to work one on one with individual attendings covering all aspects of radiation oncology including malignancies of the head and neck, lung, breast, gastrointestinal, gynecological, prostate and brain. Students work with radiation oncology residents in the initial evaluation of patients, formulation of treatment, supervision of treatment, and follow-up evaluations. Students will learn indications and techniques for radiation therapy. With each new patient, the student will be expected to go in to see the patient first and obtain a basic history and physical. This will be presented to the resident who will then review these findings directly with the attending. The clinical team (resident/attending/student) will then discuss treatment options with the patient and formulate a treatment plan. At the conclusion of this course students will be able to take a focused oncologic history, perform a pertinent exam, and understand the basics of diagnosis, staging, and treatment options for cancer patients. They will learn about the multidisciplinary nature of oncologic care. At the end of the rotation students are required to give an oral presentation at the departmental teaching seminar.

RADO 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work at Vanderbilt. Approval required.

RADO 7100. AWAY ACE: Radiation Oncology. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

RADO 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Radiation Oncology

RADO 5315. Introduction to Radiation Oncology. This elective is designed to introduce students to the field of radiation oncology. This will require approximately 40 hours per week. No nights or weekends. Students will be paired with attending/resident pairs which will be assigned on a daily basis by the chief resident. With each new patient, the student will be expected to go in to see the patient first and obtain a basic history and

Surgery

CHAIR OF THE SECTION R. Daniel Beauchamp

General Surgery

General Surgery, VAH
Colon and Rectal Surgery
Emergency General Surgery
Gastrointestinal and Laparoscopic Surgery
Hepatobiliary/Liver and Renal Transplant
Surgical Oncology
Trauma

Surgical Specialties

Cardiac Surgery
Neurological Surgery
Oral and Maxillofacial Surgery
Pediatric Surgery
Plastic Surgery
Thoracic Surgery
Urologic Surgery

SURG 5020. Surgery Core Clerkship. This is the third-year clinical core rotation. For ten weeks, each student in the third-year class is assigned to the surgical divisions of Vanderbilt University Hospital or Nashville Veterans Administration Medical Center. Under the direction and supervision of the staff, the student takes histories, does physical examinations and assists the staff in the diagnostic evaluation and clinical management of assigned patients. Half of each student's period of clinical work is in general surgery. The other five weeks of the clinical assignment provide two (2) rotations to the specialty services in Anesthesiology (VAH), Cardiothoracic (VUH,VAH), Interventional Radiology (VUH), Neurosurgery (VUH), Ophthalmology (VUH), Orthopaedic Surgery (VUH), Otolaryngology (VUH), Pediatric Surgery (VUH), Plastic Surgery (VUH), Renal Transplant (VUH), Urology (VUH), Vascular Surgery (VUH), and Trauma (VUH). These rotations provide exposure to a variety of patients with problems in general surgery and in the specialty fields of surgery. Members of the staff hold teaching sessions daily. Students go with their patients to the operating rooms where they are observers and assistants. An integral part of this clerkship is the core lecture series in surgery. Students will be assigned faculty preceptors for small group discussions.

SURG 5310. Reconstructive Urology. Students will join a team of attendings, fellows, and residents on the Reconstructive Urology service at Vanderbilt Hospital and Cool Springs Surgery Center. Students will participate in the operating room, clinics, outpatient procedures, didactics, and inpatient management for the Reconstructive Urology service. Common issues encountered and treated on this service include incontinence, urethral stricture disease, erectile dysfunction, Peyronie's disease, voiding dysfunction, pelvic organ prolapse, and neurogenic bladder. At the conclusion of the two-week elective rotation, students will be able to take a focused urologic history and physical, understand the basics of evaluation and management of reconstructive urology issues, and appreciate the medical and surgical modalities utilized to diagnose and treat these patients. Additionally, the students will gain a familiarity with the use of evidence-based medicine as it applies to reconstructive urology.

SURG 5315. Introduction to Plastic Surgery. In this two-week elective, students will be exposed to the broad spectrum of plastic surgery including pediatric plastic surgery (cleft lip and palate, major craniofacial surgery, and other congenital and acquired anomalies), hand surgery, microvascular surgery, burn surgery, reconstructive surgery of the extremities, and breast, head, and neck reconstruction. They will also have the opportunity to be exposed to cosmetic plastic surgery including facial rejuvenation, breast enhancement and reduction, and other body contouring procedures. At the end of the rotation, students will have a much greater knowledge and appreciation of the role that plastic surgery plays in patient care.

SURG 5320. Cardiac Surgery Mechanical Support. This will be a two-week elective in the CVICU focusing on advanced mechanical support in cardiac surgery. The students will be given patients who are undergoing mechanical support which may include a left ventricular assist device,

Impella, ECMO, etc. Students will round with the team and present these patients. After rounds they will receive hands-on simulator training and review echocardiography images on cardiac surgery patients. Lectures will discuss the types of mechanical devices and hemodynamic assessment with pulmonary artery catheters and echocardiography. If for some reason there are no mechanical devices, students will care for the most complex patients in the ICU. At the conclusion of the elective, students will understand the different types of mechanical support, know advanced cardiac physiology, understand basic transesophageal and transthoracic echocardiography, have experience using echocardiography on a simulator, and will be able to present on extremely complex cardiac surgery patients.

SURG 5325. Fundamentals of Spine Surgery. Students participating in this elective will have an in-depth exposure to the diagnosis and surgical management of spine disorders. Students will spend several days each week in the neurosurgical operating room, observing and participating in cases ranging from the treatment of degenerative disorders to spinal tumors and spine trauma. Emphasis will be placed on learning key anatomic and surgical concepts that optimize patient outcomes. Students will also spend time with neurosurgery faculty in the outpatient clinic setting and develop practical experience with physical examination, clinical diagnostics, and treatment decision making. Student will participate in inpatient rounds, consults, and conferences such as the multidisciplinary spine conference and journal club. Much of the students' learning will occur in a case-based manner through exposure to individual patients, but didactic instruction will include several key readings and interactive discussion. At the conclusion of the two-week elective, students will understand the basic paradigms used in the treatment of common spine disorders and the principles of basic neurologic exam of the spine patient. They will be familiar with the assessment of common neuroimaging and with key anatomic, physiologic, biomechanical, and oncological principles used to treat these disorders as well as non-operative strategies employed in both outpatient and emergency settings.

SURG 5330. Brain Tumors:A Surgical Perspective. This elective will offer an introductory exposure to the multidisciplinary approach used to treat patients with brain tumors. Students will spend several days each week in the neurosurgical operating room, observing and participating in cases including open and endoscopic resections of gliomas, metastases, meningiomas, and skull base tumors. They will have the opportunity to review the pathology specimens with the neuro-pathologists and attend the neurosurgical brain tumor clinic as well as the neuro-oncology and radiation oncology clinics. Students will participate in teaching rounds on the neurosurgery brain tumor service, sit in on discussions between faculty and patients, and attend conferences such as brain tumor board and journal club. In addition to case-based learning, students will read several key readings and discuss these with faculty. At the conclusion of the two-week elective, students will understand the basic paradigms used in the treatment of common brain tumors. They will be familiar with surgical techniques used to treat brain tumors, and they will gain insight into the multidisciplinary aspect of oncology and techniques for communicating difficult news to patients.

SURG 5335. Pediatric Neurosurgery. Students participating in this elective will have an introductory exposure to the surgical treatment of neurologic disorders in children from infancy through adolescence. Each day will begin with attendance at morning report, where overnight consults and upcoming cases are discussed. Students will spend several days each week in the neurosurgical operating room, observing and participating in cases including resection of brain tumors, epilepsy surgery, and treatment of hydrocephalus, spine disorders, and trauma. Students will also spend time seeing patients in the clinic; participating in inpatient rounds and consults; sitting in on discussions between faculty, patients, and families; and attending conferences such as pediatric brain tumor board and journal club. In addition to case-based learning, students will read several key readings and discuss these with faculty. At the conclusion of the two-week elective, students will understand the basic paradigms used in the treatment of common neurologic disorders in children. They will be familiar with surgical techniques used to treat these disorders, and they will become familiar with non-operative strategies employed in both the outpatient and critical care settings and techniques for communicating difficult news to patients.

SURG 5610. ACE: Ophthalmology. Ophthalmology is a wonderful specialty, combining both medical and surgical care of the eye and the periorcular structures. The ACE will allow medical students to participate in care delivered at the Vanderbilt Eye Institute, the Nashville Veterans' Affairs Hospital, and the Vanderbilt University Hospital's inpatient and emergency room. Through shadowing attendings and performing ophthalmic exams, it is expected at the conclusion of the ACE a medical student will be able to (1) perform a basic slit-lamp examination and a dilated fundus examination with a direct ophthalmoscope; (2) have a working understanding of the major etiologies of vision loss in the United States, including cataracts, glaucoma, age-related macular degeneration, diabetic retinopathy and amblyopia; and (3) accurately diagnose common ophthalmic issues, including corneal abrasions, conjunctivitis and acute-angle closure glaucoma. Additionally, the societal impact of loss of vision on a person's activities of daily living, the reestablishment of independence following restoration of sight and the evolving role of the ophthalmologist providing this care should be appreciated by the medical student.

SURG 5611. ACE: General Orthopedics. This course provides hands-on exposure to all aspects of orthopaedic surgery. The student will be able to integrate medical and surgical knowledge in the care of patients with musculoskeletal diseases in both inpatient and outpatient settings. Emphasis will be placed on initial evaluation, preoperative and postoperative management as well as intraoperative surgical procedures. Students will act as part of a multi-disciplinary team during this course. Students are also allowed to share the call experience where they are independently providing casting and splinting care and patient evaluations. Exposure to musculoskeletal oncology and adult orthopaedics is incorporated. Didactic sessions are held for one hour each morning prior to surgical cases or clinic during which the student will be able to integrate medical and surgical knowledge in the care of patients.

SURG 5612. AI: Surgery, VAH. Students in the acting internship in surgery at the Veterans Affairs Hospital can elect to spend time on general surgery, vascular surgery, cardiothoracic surgery, or a combination thereof. Students will function in a supervised environment and be expected to fulfill the role of a surgical intern, including caring for their own patients, writing orders, and having a role in the conduct of operations. Students will be exposed to the full range of clinical activities of each of these services, and they will also have the opportunity to participate in preoperative evaluation, intraoperative management, and postoperative care. The student will actively participate in a weekly clinic. Each service has a full complement of conference activities, which the student will attend. There will be close observation of the student's activities by the house staff and the attendings. Weekly feedback will be provided for reflection. Students will have in-house overnight call at least four times during the four-week rotation and participate on morning ward rounds Saturday and Sunday twice during the four weeks. Workups, progress notes, and clinic notes will be read and feedback provided for the student's reflection and improvement. The strengths of this ACE on VA Surgery include the residents and attendings, the active role of the student, the breadth of clinical exposure, and the personal coaching provided.

SURG 5613. ACE: Surgery, VAH. Students rotating on surgery at the Veterans Affairs Hospital can elect to spend time on general surgery, vascular surgery, cardiothoracic surgery, or a combination thereof. Students will be exposed to the full range of clinical activities of each of these services, and they will also have the opportunity to participate in preoperative evaluation, intraoperative management, and postoperative care. The student will actively participate in a weekly clinic. Each service has a full complement of conference activities, which the student will attend. There will be close observation of the student's activities by the house staff and the attendings. Weekly feedback will be provided for reflection. Students will have in-house overnight call at least four times during the four-week rotation and participate on morning ward rounds Saturday and Sunday twice during the four weeks. Workups, progress notes, and clinic notes will be read and feedback provided for the student's reflection and improvement. The strengths of this ACE on VA Surgery include the residents and attendings, the active role of the student, the breadth of clinical exposure, and the personal coaching provided.

SURG 5614. ACE: Surgery Critical Care. The Surgical Critical Care Advanced Clinical Elective provides students with a multidisciplinary approach to care of the critically ill surgical patient. The units are very active critical care facilities with state-of-the-art monitoring and support technology. The course content emphasizes a physiologic approach to the care of critically ill general, vascular, transplant, geriatric, oncology, and emergency surgical patients. Students will gain experience with invasive hemodynamic monitoring, mechanical ventilation, enteral/parenteral nutrition, surgical infectious disease, and management of vasoactive medications. Topics such as cost containment, resource utilization, and medical ethics are an integral part of daily intensive care management. The patient care service consists of a surgical or anesthesia attending physician, a surgical critical care fellow, mid-level surgical/anesthesia residents, and surgical interns. Other staff available in the unit includes clinical pharmacists, respiratory therapists, and nurse practitioners. Teaching rounds are made each morning with didactic lectures and case-discussions Monday–Thursday. Friday morning attendance of surgical grand rounds and resident teaching conference is mandatory. A course syllabus containing management protocols and educational objectives is provided to all registrants. Evaluation of the student's performance is based on clinical knowledge, basic science application, integration into the team, and progression in learning throughout rotation. Mid-rotation and final evaluations of each student will be conducted by the critical care attendings, critical care fellow assigned to the unit, and the course director. This course fulfills the acute care requirement.

SURG 5615. ACE: Vascular Surgery. The field of vascular surgery has been markedly transformed over the last two decades, fueled by an explosion of technological advancement, research-supported clinical science development, and cross-disciplinary collaboration. Students enrolled in this ACE will experience a hands-on introduction to this rapidly evolving field by immersing themselves into the vascular surgery team at Vanderbilt Hospital. The engaged student can look forward to the prospect of caring for patients in the inpatient and outpatient settings, where he or she will learn about the various surgical manifestations and functional burdens imposed by atherosclerotic disease, aneurysmal disease, diabetes mellitus, and inherited disorders of the vascular and hematologic systems. As part of the care team, students may be asked to field consult requests from our affiliated services, and will have the opportunity to join the surgical staff in the operating theater to experience both open and endovascular surgery. By the end of this course, it is our sincere hope that the students develop an interest in pursuing a career in vascular surgery, or at least have a sound knowledge base that will help in the care of all aspects of adult medicine.

SURG 5617. ACE: Colon and Rectal Surgery. The Colorectal Surgery ACE focuses on the care of patients suffering from diseases and disorders of the colon, rectum and anus. This includes such diseases as colorectal cancer, anal cancer, inflammatory bowel disease, diverticulitis, colon polyps, and benign anorectal conditions. The goal of the rotation is to broaden the student's understanding about the pathophysiology, clinical presentation, work-up and treatment of common colorectal diseases. The students will be exposed to all aspects of the care of the patient including evaluation in the clinic, pre-op teaching, operative management, post op care and discharge. Students will see a variety of surgical techniques including laparoscopic, open, and robotic cases as well as advanced endoscopic procedures and anorectal cases. Students will function as part of the colorectal team and will be assigned patients that they will follow throughout the duration of their hospital stay. They will be expected to participate on rounds as well as attend/present at the weekly colorectal surgery conference.

SURG 5618. ACE: Hepatobiliary. The hepatobiliary and liver transplant surgery rotation includes the full spectrum of benign and malignant disease of the liver, pancreas and bile ducts. This service allows exposure for rotating students to complex hepatobiliary anatomy and pathophysiology, including liver failure. Unique to this rotation is the opportunity to participate in organ procurements, a very popular operation amongst surgical students. Abdominal organ procurement offers unparalleled anatomic exposure to the abdomen and pelvis. Rotating students will participate directly in these operations and they have the right of first refusal on each procurement. As there is ample opportunity to see these operations, a

waiting list is compiled for other students to travel for these operations, which are often off site. Students will have the opportunity to function as an integral member within the surgical resident clinical teams, as well as attend weekly clinics and teaching conferences, including Hepatobiliary Conference, Liver Transplant Selection Committee and Liver Team Walk Rounds. The course will focus on enhancing student clinical practice-based learning skills. Students will have the opportunity to (1) deepen their understanding of the complex anatomy and pathophysiology of the liver, (2) learn the basic principles of multidisciplinary management of liver failure, (3) review the differential diagnoses and therapeutic strategies for the liver mass, and (4) understand the numerous complications seen after hepatobiliary and liver transplant procedures. Additionally, students will not be expected to stay for overnight call on a rotating schedule. However, given the emergency nature of procurements and transplants, after hour effort is common, as dictated by the on-call attending and resident staff.

SURG 5619. AI: GI/Lap Surgery. The AI rotation of the GI/Lap service will expose the student to a broad variety of general surgical and advanced laparoscopic procedures. The student will be integrated into the four resident teams and will be expected to fully participate in activities-patient rounds, duties in the operating room, and all educational conferences. If desired, the student can choose to focus their clinic or OR time on a subset of the practice such as bariatric surgery, laparoscopic foregut surgery, or advanced endoscopic procedures and the faculty who perform them.

SURG 5620. ACE: Neurological Surgery. Neurosurgery is a fast-paced, challenging field dedicated to the comprehensive treatment of critically ill patients with neurologic diseases. It is an incredibly diverse specialty, incorporating treatment of children and adults suffering from CNS tumors, cerebrovascular disease, movement disorders, spine disorders, peripheral nerve diseases, and trauma. Each student will spend their four weeks rotating through the four different neurosurgical services to gain a broad exposure to the field. Students will take part in the care of inpatients, the workup of consults, and the technical aspects of a variety of bedside and operative procedures. They will also attend several outpatient clinics and take overnight call with the junior resident on a Q4 schedule. Students will participate in career development sessions designed to prepare them for the residency application process and will give several short presentations to the clinical teams and the department throughout the rotation.

SURG 5621. ACE: Surgical Critical Care, VAH. This ACE will expose medical students to care of a broad range of postoperative surgical critical care patients, including cardiothoracic, neurosurgical, otolaryngical, orthopedic, vascular, and general surgical patients. This course fulfills the acute care requirement.

SURG 5623. ACE: General Surgery, STH. General and vascular surgery require broad diagnostic and patient care skills, in addition to technical expertise. The student pursuing any surgical specialty should have advanced experience in managing the wide spectrum of surgical pathology and comorbid conditions seen on a tertiary surgical service. This course offers additional exposure to pathology in disease processes ranging from sepsis, respiratory failure, renal failure, wound issues, as well as end of life and palliative care. Students will have the opportunity to work with multiple attending preceptors and be a part of surgical resident teams, as well as participate in general surgery and multidisciplinary vascular and surgical oncology conferences. The course will focus on enhancing student clinical practice-based learning skills. Students will have the opportunity scrub on a wide variety of operations and take overnight call with experienced surgical residents, exposing them to the intricacies of patient care on a one on one basis. Students will be expected to stay for overnight call at least four times during the four-week rotation.

SURG 5624. AI: Surgery Critical Care. The Surgery Critical Care Acting Internship provides students with a multidisciplinary approach to care of the critically ill surgical patient. Students will function in a supervised environment and be expected to fulfill the role of a surgical intern. It is our goal to provide increased responsibility to the student and offer further preparation for upcoming residency. The units are very active critical care facilities with state-of-the-art monitoring and support technology. The course content emphasizes a physiologic approach to the care of critically ill general, vascular, transplant, geriatric, oncology, and emergency surgical patients. Students will gain experience with invasive hemodynamic

monitoring, mechanical ventilation, enteral/parenteral nutrition, surgical infectious disease, and management of vasoactive medications. Topics such as cost containment, resource utilization, and medical ethics are an integral part of daily intensive care management. The patient care service consists of a surgical or anesthesia attending physician, a surgical critical care fellow, mid-level surgical/anesthesia residents, and surgical interns. Other staff available in the unit includes clinical pharmacists, respiratory therapists, and nurse practitioners. Teaching rounds are made each morning with didactic lectures and case-discussions Monday-Thursday. Friday morning attendance of surgical grand rounds and resident teaching conference is mandatory. A course syllabus containing management protocols and educational objectives is provided to all registrants. Evaluation of the student's performance is based on clinical knowledge, basic science application, integration into the team, and progression in learning throughout rotation. Mid-rotation and final evaluations of each student will be conducted by the critical care attendings, critical care fellow assigned to the unit, and the course director. Call expectations are one night each week and two weekend nights (total of six night-call shifts) during the rotation. This course fulfills the acute care requirement.

SURG 5625. ACE: Otolaryngology. The Otolaryngology ACE is a surgical and medical course that offers immersion into the oldest medical specialty in the United States. This course deals with disorders of the ear, nose, and throat and involves the Head and Neck/Laryngology, Pediatric Otolaryngology, Rhinology/Plastic Surgery, and Otolaryngology services. Rotations provide the clinical complexity of various head and neck pathologies and explores medical and surgical treatment plans. The course will focus on the diagnosis, treatment, and management of many specialty specific disorders as well as primary care problems associated with pediatric and adult patients in the ambulatory, inpatient and operating room setting. Rotators will encounter disorders including ear disease and hearing loss, head and neck cancer, voice and communication disorders, obstructive sleep apnea, and airway abnormalities. The outpatient setting will enhance and reinforce a thorough head and neck examination, including the ear exam, and foster development of an otolaryngologic assessment and plan. Additionally, students will be able to be involved with the inpatient otolaryngology team and aid in and observe operating room procedures. Students will have a unique look into the complexities of this specialty and become involved with the multi-disciplinary approaches to treatment with other team members including: audiologists, speech pathologists, radiologists, pulmonary and gastroenterology physicians.

SURG 5628. AI: Hepatobiliary. The hepatobiliary and liver transplant surgery rotation includes the full spectrum of benign and malignant disease of the liver, pancreas and bile ducts. This service allows exposure for rotating students to complex hepatobiliary anatomy and pathophysiology, including liver failure. Unique to this rotation is the opportunity to participate in organ procurements, a very popular operation amongst surgical students. Abdominal organ procurement offers unparalleled anatomic exposure to the abdomen and pelvis. Rotating students will participate directly in these operations and they have the right of first refusal on each procurement. As there is ample opportunity to see these operations, a waiting list is compiled for other students to travel for these operations, which are often off site. Students will have the opportunity to function as an integral member within the surgical resident clinical teams, as well as attend weekly clinics and teaching conferences, including Hepatobiliary Conference, Liver Transplant Selection Committee and Liver Team Walk Rounds. The course will focus on enhancing student clinical practice-based learning skills. Students will have the opportunity to (1) deepen their understanding of the complex anatomy and pathophysiology of the liver, (2) learn the basic principles of multidisciplinary management of liver failure, (3) review the differential diagnoses and therapeutic strategies for the liver mass, and (4) understand the numerous complications seen after hepatobiliary and liver transplant procedures. Additionally, students will not be expected to stay for overnight call on a rotating schedule. However, given the emergency nature of procurements and transplants, after hour effort is common, as dictated by the on-call attending and resident staff. Als additionally participate in the service much as PGY1 interns do with the exception that they are closely supervised for order writing and procedures. They are also given priority for elective cases and procurements over students in the ACE. However, since interns on this rotation do not

often go to the OR for elective cases and this course as an acting internship is designed to empower the student to act as an intern on the service, operative experience is a secondary objective.

SURG 5630. ACE: Cardiac Surgery. The cardiac surgical service deals with congenital and acquired heart disease, pulmonary vascular disease, and anomalies of the arterial and venous systems in the chest in both pediatric and adult patients. Students will have the opportunity to evaluate patients in the clinic with complex vascular, valvular, and cardiac lesions and understand their anatomy and physiology. They will be introduced to cardiac ECHO, cardiac MRI, CT scans of the chest, and cardiac catheterization by the attending surgeon. They will follow the patient to the operating room where they will participate in the surgical repair and to the CVICU and step-down unit for postoperative care. In the CVICU the student will be introduced to the evaluation of hemodynamic parameters; use of vasopressors, dilators and antiarrhythmics; postoperative pacing, ECHO and ventilator management. During the four-week course the student may get the opportunity to participate in an aortic dissection repair, ventricular assist device insertion, cardiac transplant, or organ retrieval.

SURG 5632. ACE: Thoracic Surgery. The Vanderbilt Thoracic Surgery Advanced Clinical Experience will introduce the student to general thoracic surgery including preoperative workup, basic thoracic surgery operative skills, and postoperative care. This rotation will teach basic thoracic surgical and endoscopic techniques. The student will learn how to recognize and care for thoracic surgery patients, including placement of chest tubes, drainage of effusion, endoscopy, and participate in various thoracic surgery operations.

SURG 5640. ACE: Urology. This ACE will encompass the care of the surgery patients admitted to the Urology service. The student will be expected to function as a member of the team at a supervised level for patient management and communication with other health care providers. This will include preparing the admission history and physical examination, entering orders, writing daily progress notes, presenting patients on daily work rounds, participating in surgical procedures, and coordinating discharge planning. Students will be additionally be given opportunity for outpatient experiences in the clinics. Students will be expected to participate in select weekend rounds and assist with triage of consults for the inpatient service.

SURG 5660. ACE: Pediatric Surgery. The Pediatric Surgery Advanced Clinical Experience will allow students to hone their clinical skills in accurate history taking, clinical assessment of children, developing an appropriate differential diagnosis and potential plan. Students will participate in the operative management of these same patients and follow their post-operative progress until discharge. Students will have the opportunity to (1) improve their knowledge of the common pathologies encountered in a pediatric surgical practice, (2) broaden their understanding of the surgical management of these problems, and (3) gain first hand experience with the depth and breadth of a clinically busy pediatric surgical service. During the rotation students will spend time with the team in clinic at least once per week, in the operating rooms, on the wards with the interns and physician extenders and seeing new consults with the team. Additionally, ACE students will be expected to stay for overnight call at least 3 times during a 4-week rotation with at least 1 day over a weekend.

SURG 5665. AI: Pediatric Surgery. The Pediatric Surgery Acting Internship will focus on honing the students clinical skills in accurate history taking, clinical assessment of both acute and chronically ill neonates and children, developing an appropriate operative (or non-operative) plan, participation in the operative management of these patients and following their post-operative progress until discharge. The AI student will have the opportunity to (1) improve their knowledge of the common and uncommon pathologies encountered in a pediatric surgical practice, (2) broaden their understanding of the operative and non-operative management of these problems, (3) gain first hand experience with the depth and breadth of a clinically busy pediatric surgical service, and (4) mentor younger students. During the rotation students will spend time with the team in clinic, in the operating rooms, on the wards and seeing new consults on their own. Additionally, AI students will be expected to stay for overnight call at least four times during a four-week rotation with at least two over a weekend.

SURG 5670. ACE: Surgical Oncology. The Advanced Clinical Experience (ACE) in Surgical Oncology offers students a broad and detailed clinical experience in the treatment of malignancies. Emphasis will be on the multidisciplinary management of a variety of malignancies including those of the liver and biliary tract, pancreas, gastrointestinal tract, retroperitoneum, breast, skin and soft tissue and endocrine systems. Students will be active participants both in the inpatient (including the operating room and floor) and outpatient settings and participate in several educational conferences including multidisciplinary tumor board, surgical oncology conferences and others and Vanderbilt University Hospital. Students will be expected to take overnight call four times during the four-week rotation.

SURG 5675. AI: Surgical Oncology. The Acting Internship (AI) in Surgical Oncology provides students with a broad but detailed clinical experience in the diagnosis and treatment of solid organ malignancies. Emphasis will be on the multidisciplinary management of a variety of malignancies including those of the liver and biliary tract, pancreas, gastrointestinal tract, retroperitoneum, breast, skin and soft tissue and endocrine systems. Students will be active participants both in the inpatient (including the operating room and floor) and outpatient settings and participate in several educational conferences including multidisciplinary tumor board, surgical oncology conferences and others and Vanderbilt University Hospital. Students will be expected to take overnight call four times during the four-week rotation. Highlights of the AI experience in Surgical Oncology will include increased responsibility with the goal of preparing the student for surgical internship, including being primarily responsible for their own patients, answering pages, writing orders under the supervision of residents, working up and presenting patients both in the inpatient and outpatient setting, and taking call which will include cross-covering of other services.

SURG 5680. ACE: Plastic Surgery. Are you interested in learning more about a surgical specialty that is so broad-based as to include all age ranges from pediatrics through geriatrics and virtually the entire body from head to foot? Are you interested in meeting with full-time faculty who are recognized nationally for their contributions to the specialty of plastic surgery? If so, consider the plastic surgery ACE as a part of your educational opportunities. During this advance clinical experience, the student works with the plastic surgery faculty and residents on the plastic surgery service at Vanderbilt University Medical Center participating in the diagnosis and management of patients, with a wide variety of reconstructive and aesthetic problems. This includes surgery of the hand, the breast and trunk, the head and neck, and the lower extremity. Patients range from pediatric to geriatric age groups and problems vary from congenital to acquired including deformity from neoplasm, burns, and trauma.

SURG 5690. ACE: Kidney Transplantation. The Kidney Transplant Surgery Advanced Clinical Experience offers the student an intensive experience in the surgical management of end-stage renal disease patients, both kidney transplantation and dialysis access. The field of kidney transplantation offers a unique blend of technically challenging surgery as well as transplant immunology, pharmacology, pathology, and infectious disease in a multidisciplinary setting. The course will focus on enhancing student clinical practice-based learning skills. Students will have the opportunity to evaluate candidates for kidney transplantation and living donor nephrectomy in the transplant surgery clinic, go to the operating room, and then manage transplant recipients and/or living donors postoperatively. As such they will be integrated into the kidney transplant team consisting of transplant surgery faculty and general surgery residents, transplant nephrology faculty and fellows, pharmacy, social work, and nursing. Didactic sessions will include a Monday morning selection committee meeting and a Friday morning transplant teaching conference in addition to the weekly Department of Surgery M&Ms and Surgical Grand Rounds. There are approximately 500,000 patients with ESRD in the United States and only a small percentage of these receive a kidney transplant. As such dialysis access is an important component of the Kidney Transplant Surgery service at Vanderbilt, and students will have the opportunity to evaluate CKD patients requiring dialysis access, observe the range of procedures in the operating room, and manage postoperative dialysis access problems.

SURG 5700. ACE: Oral and Maxillofacial Surgery. Oral and maxillofacial surgery is the clinical discipline that focuses on the management of diseases, deformities, injuries, and defects of the oral and facial structures. With

elements of dentistry, medicine, anesthesia, and surgery, the ACE provides exposure to a wide array of clinical conditions ranging from lesions and conditions of the oral cavity, odontogenic head and neck infections, cleft palate, oral/facial reconstruction, total temporomandibular joint replacement, complex facial fractures to congenital and acquired deformities of the jaws and facial bones. Students will be active participants in clinical and didactic activities. Practice-based learning and systems-based practice methods will be emphasized. Students will have the opportunity to (1) enhance their fund of knowledge in clinically relevant overlapping areas of dentistry/oral surgery and medicine, (2) improve their working understanding of head and neck anatomy, (3) review common infections of the oral and head and neck region, (4) learn fundamental principles of head and neck reconstruction, and (5) participate in the delivery of clinic-based ambulatory anesthesia. Students will be expected to take facial trauma call.

SURG 5701. AI: Oral and Maxillofacial Surgery. This Acting Internship focuses on the management of diseases, deformities, injuries, and defects of the oral and facial structures. With elements of dentistry, medicine, anesthesia, and surgery, the AI provides exposure to a wide array of clinical conditions ranging from lesions and conditions of the oral cavity, odontogenic head and neck infections, cleft palate, oral/facial reconstruction, total temporomandibular joint replacement, complex facial fractures to congenital and acquired deformities of the jaws and facial bones. Students will be active participants in clinical and didactic activities. Practice-based learning and systems-based practice methods will be emphasized. Students will have the opportunity to (1) enhance their fund of knowledge in of diseases, injuries, and congenital and acquired deformities of the oral and maxillofacial regions, (2) improve their working understanding of head and neck anatomy, (3) review common infections of the oral and head and neck region and principles of surgical and pharmacologic infection management, (4) learn fundamental principles of head and neck reconstruction, (5) apply principles of facial trauma patient evaluation and facial fracture management, (6) participate in the delivery of comprehensive ambulatory oral surgical services, and (7) participate in the delivery of clinic-based ambulatory anesthesia and in the management of simulated anesthetic emergencies. Students will be expected to take facial trauma call. For students in the Oral Surgery Residency program only.

SURG 5850. ACE: Trauma. The Trauma ACE allows students to follow injured patients from the moment they arrive until discharge. This includes management in all settings, ICU, floor, clinic and the option of time in the comprehensive traumatic brain injury clinic. Students will be introduced to high-level procedure-based situations including central venous access, tube thoracostomies, bronchoscopy, advanced suturing techniques and operative management of the trauma patient. Expectations will focus on the complex management of patients including coordination of care with other subspecialties, identifying and managing critical care issues such as ventilator management, massive resuscitation efforts, complexities of organ failure and sepsis, end-of-life decisions and organ donation. Opportunities for both day and night coverage will allow the student to obtain a complete understanding of the field of trauma (the #1 cause of death for all patients age 1-45). This course fulfills the acute care requirement.

SURG 5930. AE: Preparation for Surgical Internship. The goal of this course is to arm fourth year medical students entering a surgical specialty with the skills and understanding needed to hit the wards as a resident. The curriculum for the course has been developed by the American College of Surgeons in conjunction with the Association for Surgical Education and Association of Program Directors in Surgery. These activities and sessions include mock pages, bedside procedures, operative anatomy using cadaveric dissections, basic open and laparoscopic skills, airway management and simulation scenarios, and will be led by some of Vanderbilt's best clinical teachers. At the end of the course, students should feel prepared to enter a surgical internship and understand their own strengths and weaknesses as they prepare for surgical training.

SURG 6100. Special Clinical Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

SURG 7100. AWAY ACE: Surgery. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

SURG 7150. Special Research Study—Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Clinical Investigation

Courses leading to the Master of Science in Clinical Investigation

MSCI 5000. Drug and Device Development. This seminar-style course is designed to provide an overview of the drug and device development process. We will cover issues of drug discovery, pre-clinical drug development, phase I through phase IV human testing, device development, and the role of the FDA in regulatory affairs. First year. Summer. [3]

MSCI 5001. Grant Writing I. (Also listed as PUBH 5517) Principles of scientific written and oral communication, with a focus on grant writing will be discussed. The principles of scientific grant writing will include how to write the background and significance, previous work, and methods sections. Students will review grants submitted to public health service study sections, participate in a mock study section, and prepare a sample grant application. Enrollment is limited. First year. Summer. [1]

MSCI 5002. Medical Writing for Clinical Investigators. This course is designed to teach clinical investigators medical writing skills required to publish scientific articles in peer-reviewed medical journals. Since candidates in the MSCI program are expected to complete their master's theses based on their research projects in the spring of year two, this course is scheduled prior to this deadline to assist students in writing their theses. Teaching will consist of demonstrations and discussions of how to improve the writing quality using each student's thesis-in-progress as an example. Each student will be expected to write and revise his or her master's thesis as course work. No additional written assignments will be required. Second year. Spring. [2]

MSCI 5003. Molecular Genetic and Genomic Medicine. The goal of this course is to expose learners to the practical and core concepts of genetics as well as provide knowledge on the various aspects of designing a genetic/genomic study. Three thematic points guide the course: (1) Core practical genetics/genomics concepts (a. The importance of Mendelian inheritance, b. Basic principles of molecular genetics, c. Genome sequencing and genetic research, d. Common variants and human disease, e. Rare variants and human disease, f. Gene expression and human disease, g. Pharmacogenomics, h. Personalized medicine, i. Ethical consideration in genetic study design, j. How to establish inter and intra institutional genetic research collaborations); (2) Approaches to model common and rare variants (a. BioVU, b. How to think about gene editing with your favorite variant, c. How to think about animal modeling with your favorite variant); and (3) Putting it all together (Success stories in genetic research from physician scientists). First year. Spring. [4]

MSCI 5005. Case Studies in Clinical Investigation I. First year MSCI students will present their project plans for class discussions. The format will be in a studio design. Students will be presenting their MSCI projects in the presence of three to four experts selected from VU faculty. It is anticipated that the studio will take place prior to submission of the project for IRB or CTSA application (if applicable). The students are expected to initiate the studio process as soon as they are accepted in the program. This course is graded pass/fail. First year. Fall. [1]

MSCI 5009. Biostatistics I. This course will teach modern biostatistical skills. Students will use statistical software to learn data analysis methods using actual clinical research data sets. Students will also learn about statistical power and sample size calculations using the software nQuery Advisor. An emphasis will be placed on performing statistical analyses and interpreting output. Commonly used statistical methods will be explained as well as the techniques that experienced biostatisticians use to analyze data. All students will be encouraged to bring a data film from their MSCI project to class to stress hands-on learning with clinical research data. First year. Fall. [4]

MSCI 5015. Biostatistics II. The objectives of this course include fundamental biostatistical concepts related to multivariable analyses in existence of confounding and effect modification. Topics include student's t-test, one-way ANOVA, linear, binary logistic, proportional odds logistic,

and Cox proportional-hazard regressions with emphasis in checking model assumptions. Basic concepts on repeated measures analysis including a mixed-effect and GEE regression models. Proper strategies for developing reliable multivariable models. Proper strategies for developing reliable multivariable models in prognostic-diagnostic research, randomized controlled trial, and observational study for causation. Prerequisite: MSCI 5009 and MSCI 5030. First year. Spring. [4]

MSCI 5016. Research Skills. This course offers basic instruction and practical advice on a variety of issues and skills related to the conduct of clinical research, often with computer demonstrations. First or second year. Fall, Spring. [1]

MSCI 5017. Clinical Scientist Career Seminars. Topics of discussion will include academic "rules of the road," time management, promotion/tenure issues, grants management, and overall program evaluation. Candidates will hone their scientific communication skills through an annual presentation at this forum. Fall, Spring. [1]

MSCI 5021. Master's Research I. Completion of a mentored research project is a required component of the MSCI program. The research must be patient-oriented and involve direct measurements on patient-derived samples or the use of investigational therapeutic or diagnostic techniques. This course is graded pass/fail. [1]

MSCI 5022. Master's Research II. Completion of a mentored research project is a required component of the MSCI program. The research must be patient-oriented and involve direct measurements on patient-derived samples or the use of investigational therapeutic or diagnostic techniques. This course is graded pass/fail. [1-3]

MSCI 5023. Master's Research III. Completion of a mentored research project is a required component of the MSCI program. The research must be patient-oriented and involve direct measurements on patient-derived samples or the use of investigational therapeutic or diagnostic techniques. This course is graded pass/fail. [1-3]

MSCI 5024. Case Studies in Clinical Investigation II. This course is designed to simulate a thesis defense. Overall, second-year MSCI students are expected to give a presentation to the class on the progress of their selected MSCI project or their project completed during the program. The extent of the presentation will depend on the accomplishments made. If requested, a studio format can be used. This course is graded pass/fail. Second year. Spring. [1]

MSCI 5025. Research Extension. This course allows for an extension on the research project. [0]

MSCI 5028. Data Management. This course is designed to teach important concepts related to research data planning, collection, storage and dissemination. Instructional material will cover best-practice guidelines for (1) investigator-initiated and -sponsored research studies, (2) single- and multi-center studies, and (3) prospective data collection and secondary-reuse of clinical data for purposes of research. The curriculum will balance theoretical guidelines with the use of practical tools designed to assist in planning and conducting research. Real-world research examples, problem solving exercises and hands-on training will ensure students are comfortable with all concepts. [1]

MSCI 5029. Research Ethics and Scientific Integrity. This course is a systematic examination of the ethical concepts and standards of biomedical science and research integrity. Its aim is to provide trainees in the biomedical sciences and clinical research a framework in which to recognize, examine, resolve, and prevent ethical conflicts in their professional work. First year. Summer. [1]

MSCI 5030. Epidemiology I. Introduction to epidemiology with an emphasis on clinical practice. Includes use of data to study disease etiology, prognosis and treatment. concepts of interpreting tests, predicting outcomes, choosing treatments and reading medical literature emphasized. First year. Fall. [4]

MSCI 5033. Big Data in Biomedical Research. I. Design and Conduct—The theoretical and practical challenges to be considered in designing and conducting a high-dimensional experiment including Next Generation Sequencing (NGS), Genome-Wide Association Study (GWAS),

microRNA (miRNA), etc., will be presented. Topics to be discussed include the specification of a primary objective, quality control and pre-processing guidelines, the role of repeatability & reproducibility studies and the means for their implementation, the type and assessment of sources of variance, the choice of design strategy and design strengthening features, and the considerations involved in sample size determination and number of replications of the same sample. *II. Analysis of High-dimensional Experiments*—Methods of analysis appropriate to various study objectives, class discovery, class comparison, and class prediction will be presented. The statistical and bioinformatic approach will be based on empirical use of methodologies rather than formal algebraic knowledge, the emphasis on understanding what the procedures do and applications to big data analysis. Methods of data quality control evaluation and various visualization tools will be discussed. Summer. [1]

MSCI 5044. Clinical Trials. Design and data analysis for clinical trials in biomedical research. Primary topics include specification of objectives, ethical guidelines, randomization, blinding, design options, sample size determination and data analysis appropriate for non-standard designs such as crossover, nested, factorial and group allocation designs. Other topics include role of clinical trials in FDA drug approval process, meta-analysis and management of clinical trial data. Emphasis is on practical use of methods rather than formal statistical theory. Fall. [3]

MSCI 5099. Independent Study. Students may choose a topic for independent study. This course is graded pass/fail. [1-5]

Audiology

Courses leading to the Doctor of Audiology

AUD 5216. Introduction to Billing and Coding for Audiology Services. This course is an overview of coding and compliance requirements for billing in an audiology practice. Topics include managed care terms, insurance contracting, billing terminology, Medicare, Medicaid, CPT, ICD 9, ICD 10, HCPCS, and modifiers. Spring Semester, [1].

AUD 5227. Anatomy and Physiology of Hearing Mechanisms. A comprehensive description of the anatomy and physiology of the peripheral and central auditory systems in normal and impaired populations. Includes a clinically oriented review of neuroanatomy focused on the major sensory and motor pathways. Fall. [3]

AUD 5233. Neuroscience. A comprehensive introduction to the field of neuroscience from important molecules to cell function, neural systems, and 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. Spring. [3] Smith.

AUD 5303. Hereditary Hearing Loss. Hereditary aspects of hearing loss in infants, children, and adults. Genetic bases of hearing loss, modes of inheritance, characteristics of syndromic and non-syndromic hearing losses. Collaboration with geneticists and genetic counselors. Recent developments and issues in evaluating and managing patients with genetic hearing loss. Summer. [2]

AUD 5310. Measurement of Hearing. The theory and practice of hearing measurement, with emphasis on routine clinical and screening audiometric techniques, testing environment, audiometric standards and calibration, applied impedance measurements, and interpretation of audiometric tests. Fall. [4]

AUD 5318. 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]

AUD 5325. Pediatric Audiology. A survey of methods and procedures used in the evaluation of the auditory function and management of neonates, infants, and young children. Includes identification and intervention procedures. There will be review of special populations of children with hearing loss. Fall. [3]

AUD 5327. 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]

AUD 5328. Psychoacoustics. Psychoacoustic theory and methods. Auditory perception in normal hearing and hearing impaired subjects. Spring. [3]

AUD 5332. Pathology of the Auditory System. A study of pathologies involving the peripheral auditory system arising from genetic factors, disease, and trauma, with emphasis applied to presenting signs/symptoms, and medical/audiological management. Fall. [3]

AUD 5337. Auditory Clinical Electrophysiology. This course will cover basic concepts in electrophysiological and electromagnetic recordings (e.g., electrode types/uses, far and near field recordings, volume conduction, dipole sources). Recording of both near and far-field electrical responses emitted by peripheral and central nervous system will be studied. Recording techniques and interpretation of conventional clinical evoked potentials (e.g., electrocochleography, auditory brainstem response, somatosensory evoked potentials, electroneurography) will be covered. Special topics will include: audiometric applications of these evoked potentials (e.g., for infant hearing screening and special needs populations, and intraoperative neurophysiological monitoring). There will be extensive laboratory practica conducted within and outside the classroom. Spring. [3]

AUD 5339. Amplification I. Background and development of the design of hearing aids, ear mold acoustics, electroacoustic characteristics, performance standards and measurement techniques, clinical selection and evaluation procedures. Corequisite: AUD 5340. Spring [2]

AUD 5340. Lab: Amplification I. Laboratory that stresses instruction and practice in basic hearing aid techniques including Otoscopic examination, ear impressions, electroacoustic evaluation and probe microphone techniques. Corequisite: AUD 5339. Spring [1]

AUD 5345. 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]

AUD 5346. Vestibular Sciences I. This course offers an in-depth approach to the basic assessment of the dizzy patient. Subject matter will include; where the vestibular system assessment falls in the audiology scope of practice, detailed anatomy and physiology of the peripheral and central vestibular, ocular motor, and postural control systems; bedside testing, introduction to both electrical and video techniques for recording the vestibuloocular reflex; case history and bedside assessment of the dizzy patient, and the technique and interpretation of video and electro-nystagmography. Students will be expected to conduct practica outside the classroom. Fall. [3]

AUD 5347. Vestibular Sciences II. This course will focus on the description of advanced assessment techniques including whole body, yaw axis sinusoidal harmonic acceleration testing and step testing, and techniques for the assessment of the otolith system including on and off-axis centrifugation, and both cervical and ocular vestibular evoked myogenic potentials. A module will be taught on the topic of peripheral and central disease and disorders affecting the vestibular system. Embedded in this module will be a section describing the multidimensional assessment of falls risk, disequilibrium of aging and the medical/surgical and non-medical management (i.e., vestibular rehabilitation) of vestibular system impairments. A final module will focus on how results of the vestibular test battery form predictable patterns. Students will be expected to conduct practica outside the classroom. Prerequisite: Successful completion of Vestibular Sciences I. Summer. [3]

AUD 5350. Vestibular Sciences III: Sensory and Motor Control of Posture. This course will cover the neural mechanisms of postural control. Multisensory integration and biomechanics that contribute to static

and dynamic posture will be explored. Normal and abnormal development, aging, and learning will be presented. The effects of pathology on postural control will be discussed. Technology including computerized dynamic posturography will be used to demonstrate concepts. Prerequisite: Successful completion of Vestibular Sciences I and II, or permission from the instructor. Fall. [2]

AUD 5353. Amplification III. Design and evaluation of auditory prostheses for listeners with hearing loss. Industrial audiology including testing, training, and intervention protocols. A discussion of noise levels, OSHA guidelines, noise-induced hearing loss, and hearing protection in work and leisure activities. Spring. [3]

AUD 5354. Cochlear Implants. This course covers basic principles of electrical stimulation of neural tissue, cochlear implant design, as well as the history of cochlear implants. Further it will cover current issues in the medical, audiological, speech/language, and educational management of adults and children with cochlear implants—emphasis on multidisciplinary team function. Prerequisite: AUD 5318. Spring. [3]

AUD 5355. Clinical Externship. Graded pass/fail. Fall [3], Spring [3], Summer [1]. [1-3]

AUD 5359. 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]

AUD 5361. Family-Centered Counseling and Interviewing. Examines the helping relationship in the clinical process, counseling theory relative to audiology practices, and principles and methods of effective clinical interviewing and counseling. Summer. [2]

AUD 5363. 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. Fall. [3]

AUD 5365. Business and Financial Management. An overview of accounting practices, marketing, and operations management as they relate to management of an audiology practice. Topics discussed include financial reporting, budgeting, pricing, billing and coding, regulatory issues, and human resource management. Students are required to design an audiology practice and develop a business plan as part of this course. Spring. [3]

AUD 5367. Professional Issues and Ethics for Audiologists. Examines professional issues in audiology including malpractice, quality improvement, marketing, credentialing, diversity, and legislation. Emphasis will be given to issues of ethics and clinical integrity in the practice of the profession of audiology. Fall. [2]

AUD 5368. Clinical Research Design and Statistical Analysis. Covers reliability, internal and external validity of group study designs, single subject designs, basic descriptive and inferential statistics, core measures in epidemiology, and conventions for reporting statistics. Summer. [3]

AUD 5374. Overview of Intraoperative Monitoring. A basic introduction to intraoperative neurophysiologic monitoring, including observation time in the operating room. Maymester. [1]

AUD 5580. Introduction to Clinical Case Conference. This course introduces students to the weekly case conference where clinical case studies will be presented. Fall. [1]

AUD 5581. Capstone I. Capstone projects may take several forms including research-based investigations, evidence-based position papers, business plans, critical literature reviews with applications to clinical problem solving, grant proposals, development of clinical protocols based on published research findings, etc. In Capstone I, students will identify an appropriate capstone committee and define their capstone projects and submit and defend a capstone proposal. Fall, Spring, Summer. [3]

AUD 5582. Capstone II. In Capstone II, students will complete their capstone project. The capstone project culminates in an oral defense of a

formal manuscript which has been submitted to the student's capstone committee. Fall, Spring, Summer. [3]

AUD 5583. Practicum and Clinical 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 [3]

AUD 5584. Independent Practicum. This course allows students to continue work toward degree requirements. Fall, Spring, Summer. [0]

AUD 5586. Summer Practicum. 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. Summer [3]

Education of the Deaf

Courses leading to the Master of Education of the Deaf

MDE 5207. American Sign Language I. This introductory course includes basic communication skills of American Sign Language and "contact" language (e.g., nonmanual markers, fingerspelling, numbers, basic vocabulary, classifiers), the sign system continuum, culture implications, and media resources available. Open to all Hearing and Speech students. Requires faculty approval. Fall only. [3]

MDE 5208. American Sign Language II. This is an intermediate course in American Sign Language that includes an in-depth look at the linguistics of ASL (e.g., morphology, syntax, phonology, and semantics) and current readings and research in the field. Prerequisite: One 3-credit-hour, college-level course in ASL. Requires faculty approval. Spring only. [3]

MDE 5308. Language and Literacy in Children with Hearing Loss. This course presents 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 reading will be included. Practical methods of assessment, supportive strategy development, and curricular adaptations for children with hearing loss will be explored. Summer. [3]

MDE 5312. Psychology and Culture of the Deaf. Presentation and discussion of significant historical and current issues relating to the deaf population. Primary focus will be on psychological development, educational/methodological models, and deaf culture. Although the principal focus is on the psycho/social and cognitive/intellectual development of deaf individuals through the lifespan, a general survey of other areas of exceptionality is made with emphasis on the implications for the deaf child with additional disabilities and/or special needs. Spring. [2]

MDE 5320. 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. [1-2]

MDE 5322. Children with Hearing Loss & Additional Disabilities. A survey of methods, procedures, and observational techniques used in the identification and evaluation of children with physical, cognitive, and/or emotional disabilities. An interdisciplinary perspective informs the course with particular attention to identifying characteristics of special populations that are atypical of children with hearing loss. Summer. [3]

MDE 5354. Cochlear Implants. This course covers basic principles of electrical stimulation of neural tissue, cochlear implant design, as well as the history of cochlear implants. Further it will cover current issues in the medical, audiological, speech/language, and educational management of adults and children with cochlear implants -- emphasis on multidisciplinary team function. Prerequisite: AUD 5318. Spring. [2]

MDE 5356. Internship/Externship: MDE/Specialty Track. 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. Summer, Spring. [2]

MDE 5358. Field Experience in Deaf Education. Students will develop appropriate skills for providing services to children with hearing loss in group settings; will collaborate with professionals in audiology and speech/language pathology; will plan sessions for family-centered intervention emphasizing communication development or plan lessons; will prepare or review individual family service plans (IFSPs) or individual education plans (IEPs); will assess speech, language, listening, cognitive, motor, and social development of children; and will evaluate effectiveness of services. Fall, Spring [3]. Summer [2].

MDE 5372. Seminar in Deaf Education. Supports student development of organizational skills that will facilitate the completion of requirements for the master's degree in education of the deaf and the transition from graduate school to a profession in deaf education. Emphasis is placed on the development of a professional portfolio, a review of certification requirements, and skill development in job searching including resume writing and interviewing skills. Spring. [3]

MDE 5390. Curriculum and Methods for Deaf Children. Presentation and discussion of current issues, methods, and materials involved in providing successful educational programming for children with hearing loss both in special programs and in inclusionary settings. This includes the adaptation of regular curriculum and instructional procedures for students with hearing impairments. Focus is on assessment of academic skills and individualizing instruction. Students gain practical experience in planning, carrying out, and evaluating lessons and are exposed to a variety of educational materials and methods. Spring. [3]

MDE 5392. Teaching Children with Hearing Loss to Listen and Speak: Early Childhood Development. 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 in early childhood development. Fall. [2]

MDE 5393. Educational Assessment for Children with Hearing Loss. The purpose of this course is to introduce students to effective assessment tools and strategies specifically for children with hearing loss. Students will become familiar with state testing protocols, and accommodations and modifications necessary for student success. Spring. [2] P. Lynn Hayes.

MDE 5394. Educational Programming and Service Delivery for Children with Hearing Loss. The course will include planning, execution, and evaluation of Individualized Education Plan (IEP) parent meetings as they relate to young children with hearing loss. The focus of this class will be on two child/family case scenarios. Students will work in multidisciplinary teams to develop and implement IEPs to be conducted in the Center for Experiential Learning and Assessment (CELA). Finally students will review videotaped sessions of each case scenario to reflect upon their role and responsibilities as members of the IEP team. Summer. [1] P. Lynn Hayes.

MDE 5584. Independent Practicum. This course allows students to continue work toward degree requirements. This course is graded pass/fail. Fall, Spring, Summer. [0]

MDE 5585. Independent Study and Readings in Deaf Education. Fall, Spring, Summer. [1-3]

Speech-Language Pathology

Courses leading to the Master of Science (Speech-Language Pathology)

SLP 5206. 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. Not intended for undergraduates and graduate students outside the Department of Hearing and Speech Sciences. Spring. [3]

SLP 5240. Introduction to Clinical Practicum. This course is for first year, first semester MS-SLP graduate students. Topics covered will include professionalism, safety issues, components of therapy session and time management, data collection, behavior management, learning objectives/goal setting, implementing treatment plans, treatment approaches for various diagnoses. This course is graded pass/fail. Fall [1]

SLP 5290. Child Language Impairments I: Nature. This course is the first in a three-course sequence on child language impairment. The focus of this course is on the characteristics of children with primary as well as secondary language impairment. Students will read the primary research literature (a) to learn skills for comprehending and interpreting the research literature, and (b) to gain knowledge on the linguistic and non-linguistic skills of subgroups of children with language impairment and children at risk for academic failure. In addition, an overview of the Individuals with Disabilities Education Act is provided. The lab component develops basic skills in language sample analysis. Fall. [2]

SLP 5291. Child Language Impairments II: Assessment. This course is the second in a three-course sequence on child language impairment. The primary focus is assessment of developmental and academic oral language skills, birth through high school, with a secondary focus on reading, writing, and intellectual assessment. Assessment measures include developmental scales, commercially published norm-referenced measures, criterion-referenced instruments, research-validated experimental measures, and progress monitoring tools. In addition, students will gain knowledge and skills in collaborating with families and teachers on assessment of children's linguistic abilities. Students will develop knowledge and skills to select and implement appropriate assessment instruments, to interpret assessment findings for differential diagnosis and IDEA eligibility, for determination of child and family strengths and needs, and to apply assessment findings for describing present level of performance, writing IEP/IFSP goals and objectives, and planning intervention. The lab component of this course will focus on application and practice of assessment measures and interpretation of assessment findings for families and teachers. Fall. [2]

SLP 5292. Child Language Impairments III: Intervention. This course is the third in a three-course sequence on child language impairments. The focus is evidence-based interventions that develop linguistic skills, primarily preschool through high school. The primary focus is on oral language skills, but literacy skills will be addressed as well (emergent literacy, decoding, spelling, reading comprehension, written expression). Intervention methods will include direct interventions with children as well as collaborative interventions delivered in conjunction with teachers and families. Students will learn to comprehend and interpret intervention research, to apply research to practice and explain the evidence base for specific clinical decisions, and to understand IDEA as it relates to school-based intervention. The lab component of the course focuses on the implementation of specific intervention strategies, procedures, and programs. Spring. [2]

SLP 5300. 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]

SLP 5301. 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]

SLP 5304. Child Language Acquisition. The components and processes of normal language development. Relations between language acquisition and social and cognitive aspects of child development as well as literacy development. Survey of developmental psycholinguistic research. This course is appropriate for graduate students with or without previous coursework in language development. Fall. [3]

SLP 5305. Clinical Principles and Procedures. Presentation and demonstration of clinical principles and procedures applicable in communication sciences and disorders. Fall. [2]

SLP 5311. Stuttering. Significant research in the field of stuttering, with emphasis on etiology and therapy. The management of fluency disturbances. Spring. [3]

SLP 5314. Articulation Disorders and Clinical Phonetics. The etiology, evaluation, and management of articulatory defects in children and adults. Prerequisite: consent of instructor. Fall. [3]

SLP 5316. 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 children at neurological risk for developing motor speech disability. Rights of the severely communicatively disabled. Spring. [2]

SLP 5317. Traumatic Brain Injury. Pathophysiology of traumatic brain injury in children and adults; unique and common sequelae, the evaluation and treatment of cognitive/communicative deficits, and special problems of the population. Prerequisite: 5300 or 5331 or consent of instructor. Summer. [2]

SLP 5319. 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]

SLP 5323. Communication in Autism Spectrum Disorders. The course addresses basic theories and principles associated with communication assessment of and intervention for children with Autism Spectrum Disorders. Auditory characteristics, causative factors, classroom structure, behavior management, communication strategies, social and peer interaction, and family-focused practices are also reviewed. This class also will provide an overview of typical social, play, and linguistic development compared to the features and behavioral characteristics of autism spectrum disorders (ASD). Fall [2]

SLP 5324. Feeding and Swallowing Disorders in Children. This course focuses on the assessment, diagnosis, and management of dysphagia in children including the role of the speech-language pathologist and multidisciplinary and family-centered, family-supported management. Prerequisite: SLP 5319. Spring. [1]

SLP 5326. Speech Disorders in Craniofacial Anomalies. The etiology, diagnosis, and management of speech defects associated with craniofacial anomalies, with major emphasis on cleft palate. Summer. [1]

SLP 5329. Augmentative and Alternative Communication Lab. This Lab in Augmentative and Alternative Communication (AAC) is designed to complement the in-class portion of the course. It will entail hands-on experiences/assignments that relate to real world AAC applications. This will include working on low- and high-tech AAC options with a view to clinical application in various populations.

SLP 5331. Aphasia. The study of aphasia in adults, including the neuroanatomical basis, etiologies, symptomatology, assessment, differential diagnosis, and treatment. Spring. [3]

SLP 5335. Augmentative and Alternative Communication. This course will cover the theory, rationale, and methods for use of augmentative and alternative communication (AAC) systems with patients with physical, intellectual, and/or cognitive disabilities. Students will be exposed to various low- and high-technology AAC systems and learn how and when to apply each in the treatment of patients with complex communication needs. Fall. [2]

SLP 5336. Voice Disorders. Theories of voice production, with emphasis upon underlying mechanisms that cause vocal defects. Procedures for group and individual management. Summer. [2]

SLP 5338. 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]

SLP 5355. Clinical Internship/Externship. 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]

SLP 5357. 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]

SLP 5360. Voice Specialty Track Acute Care Experience. This course is designed to expose students to clinical practice in an acute care setting as it pertains to voice and upper airway disorders. Students will observe diagnosis and treatment of communication and swallowing disorders in patients with laryngectomy and other head and neck cancers, in patients with tracheostomy and on ventilators, and with other populations as available. Students will have the opportunity to provide some direct patient care. This course is graded pass/fail. Summer. [1]

SLP 5361. Family-Centered Counseling and Interviewing. Examines the helping relationship in the clinical process, counseling theory relative to speech-language pathology practices and principles and methods of effective clinical interviewing and counseling. Spring. [1]

SLP 5378. Advanced Voice Instrumentation and Lab. This advanced seminar will discuss the theoretical foundations and practical applications of instrumentation and technology in the assessment and treatment of voice and voice disorders. The focus will be on the development of advanced skills and training in the use of instrumentation and technology in research and clinical practice. Summer. This course is graded pass/fail. [1]

SLP 5388. Independent Study/Readings in Speech Pathology. Independent Study/Readings in Speech Pathology. Fall, Spring, Summer. [Variable credit 1-3]

SLP 5391. Advanced Voice Research and Rehabilitation. This advanced seminar will discuss historical and current research in the assessment and treatment of voice disorders. Emphasis will be placed on understanding the theoretical basis of clinical practice in voice and applying standards of evidence-based practice to evaluating therapeutic methods. Prerequisite: Enrolled as master's degree student in Hearing and Speech Sciences program. This course is graded pass/fail. Fall. [1]

SLP 5397. Speech-Language-Literacy Seminar. Course limited for enrollment to graduate speech-language pathology masters students who are enrolled in the School Speech-Language Pathology Specialty Track. Topics vary each semester; a two-year curriculum of topics prepares students for school-based practice of speech-language pathology.

SLP 5583. Practicum and Clinical 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]

SLP 5584. Independent Practicum. This course allows students to continue work toward degree requirements. This course is graded pass/fail. Fall, Spring, Summer. [0]

SLP 5587. Advanced Clinical Practicum/Case Conference. This course includes attendance at weekly case conferences where clinical case studies will be presented. It reflects additional load of clinical training. The grade for this class will include case conference attendance as well as clinical performance and attendance. Prerequisite: 4 hours of SLP 5583. Spring. [3]

SLP 7999. Master's Thesis Research. [Formerly SLP 5369] This course is graded pass/fail. Fall, Spring, Summer. [0]

Laboratory Investigation

Courses leading to the Master of Laboratory Investigation

MLI 5010. Lab Theory I. [Formerly MLI 1010] This is a lecture and hands-on course designed for M.L.I. students and covers methods for the production, detection, molecular biological and immunological characterization, purification, and conjugation (e.g., to beads, biotin, dyes, enzymes, etc.) of recombinant proteins and antibodies for research use. Fall, Spring, Summer. [4]

MLI 5011. Lab Theory II. [Formerly MLI 1011] This is a lecture and hands-on course designed for M.L.I. students and covers methods for the production, detection, immunological characterization, purification, conjugation (e.g., to beads, biotin, dyes, enzymes, etc.), and assay development of hybridoma monoclonal antibodies for research use. Fall, Spring, Summer. [4]

MLI 5012. Lab Theory III. Lab Theory III (2 didactic credits) is a semester long lecture and hands-on, project management course designed to teach students how to select, characterize and/or modify antigen-specific recombinant antibodies for research, diagnostic or therapeutic use. Data stemming from Lab Theory III projects should address basic research or medical needs and be suitable for publication as a peer reviewed article in a scientific journal.

MLI 5013. Lab Theory IV. Lab Theory IV (2 didactic credits) is a semester long lecture and hands-on course designed to teach students technical writing skills and the formalities needed to submit manuscripts for publication that describe projects and project outcomes. Students participating in projects in which manuscripts are accepted for publication will be listed as first author or as a co-author—subject to level of participation as determined by the course instructor.

MLI 5040. Responsible Conduct in Research. [Formerly MLI 1040] This required course includes 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. Summer. [1]

MLI 5200. Foundations in Introductory Biochemistry. [Formerly MLI 2200] An introductory course covering fundamental concepts in biological chemistry. Topics include amino acids, proteins, enzymology, and basic carbohydrate and fat metabolism. MLI students only. Summer. [2]

MLI 6020. Research Project. [Formerly MLI 3020] This course is designed for students who choose the modified research track. Students will conduct research and present their research formally, but a thesis will not be a requirement. Research must be conducted outside of one's job requirements. Fall, Spring, Summer. [0-6].

MLI 6025. Independent Study. [Formerly MLI 3025] This course allows a student to pursue individualized professional research or training goals. Fall, Spring, Summer [0-4]

MLI 6030. Training and Techniques I. [Formerly MLI 3030] This course is designed for students with a strong academic/research background who are strengthening their laboratory techniques. Students will conduct laboratory research on a project designed by a highly skilled faculty/research scientist preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review. Fall, Spring, Summer [0-6]

MLI 6031. Training and Technique Modules: Microscopy. [Formerly MLI 3031] 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. Summer. [0-3]

MLI 6032. Training and Technique Modules: RT-PCR. [Formerly MLI 3032] 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. Spring. [0-3]

MLI 6035. Training and Techniques II. [Formerly MLI 3035] This course is designed for students with a strong academic/research background who are strengthening their laboratory techniques. Students will conduct laboratory research on a project designed by a highly skilled faculty/research scientist preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review. Fall, Spring, Summer. [0-6]

MLI 6040. Training & Technique Modules: Fluorescence Activated Cell Sorting. [Formerly MLI 3040] Students will learn basic to advanced techniques for using the most advanced Flow Cytometers in use today. This course will include some history of the technology as well as the Einsteinian principles that are the foundation of this technology while practically applying the lessons they learn first hand on instruments in the Flow Cytometry Core lab. There will be two classes per week for eight weeks

culminating in the challenge of applying what students have learned to diagnose and repair a non-functional cytometer. Spring. [0-2]

MLI 6041. Training and Technique Module: Immunohistochemistry and Immunofluorescence. [Formerly MLI 3041] Immunohistochemistry (IHC) and immunofluorescence (IF) is a lecture and hands-on techniques course designed to teach students the principles and procedures needed to conjugate antibodies to biotin, dyes, and enzymes and to use conjugated antibodies to detect antigens present in tissue samples at the microscopic level. [2]

MLI 7999. Thesis Research and Defense. [Formerly 3010] This course is designed for students who choose the thesis track and will develop a research project and thesis under the direction of a mentor. Fall, Spring, Summer. [1-12].

Medical Physics

Courses leading to the Doctor of Medical Physics and the Master of Science in Medical Physics

Diagnostic Radiology

RAMD 5301. Medical Physics Seminar I. Topics in medical imaging, techniques and applications. Fall, Spring. [1]

RAMD 5313. 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. Fall. [3]

RAMD 5317. Laboratory In Clinical Diagnostic Physics. Laboratory In the application of principles, techniques, and equipment used in radiographic and fluoroscopic x-ray, CT, MRI, nuclear medicine, and ultrasound. Fall. [2]

RAMD 5390. Master's Independent Study (Diagnostic). Introductory problem solving topic in diagnostic medical physics including data taking, analysis, and write-up. [1-2]

RAMD 5391. Medical Physics Diagnostic Practicum I. Experience and training in a diagnostic physics clinical setting; instrumentation methodology, calibration, and quality assurance. This course also includes diagnostic radiology patient interaction, clinical conference attendance, and review of imaging techniques in radiology. [1-4]

RAMD 5392. Medical Physics Diagnostic Practicum II. Experience and training in a diagnostic physics clinical setting; instrumentation methodology, calibration, and quality assurance. This course also includes diagnostic radiology patient interaction, clinical conference attendance, and review of imaging techniques in radiology. [1-4]

RAMD 5393. Doctoral Independent Study I. Advanced problem solving topic in diagnostic medical physics including literature survey, data taking, analysis, and manuscript submission. [1-3]

RAMD 5394. Doctoral Independent Study II. Advanced problem solving topic in diagnostic medical physics including literature survey, data taking, analysis, and manuscript submission. [1-3]

RAMD 5395. Medical Physics Clinical Rotations I. Advanced experience and clinical training in a diagnostic radiology department setting; instrumentation (methodology and calibration), quality assurance, and problem solving. For third- and fourth-year doctoral students. Fall, Spring, Summer. [3-6]

RAMD 5396. Medical Physics Clinical Rotations II. Advanced experience and clinical training in a diagnostic radiology department setting; instrumentation (methodology and calibration), quality assurance, and problem solving. For third- and fourth-year doctoral students. Fall, Spring, Summer. [3-6]

RAMD 5397. Medical Physics Clinical Rotations III. Advanced experience and clinical training in a diagnostic radiology department setting; instrumentation (methodology and calibration), quality assurance, and problem solving. For third- and fourth-year doctoral students. Fall, Spring, Summer. [3-6]

RAMD 5401. Medical Physics Seminar II. Topics in medical imaging, techniques and applications. [1]

Therapeutic Radiology

RAMT 5248. Radiation Biophysics. Response of mammalian cells and systems to ionizing radiation, the acute radiation syndromes, carcinogenesis, genetic effects, and radiobiological basis of radiotherapy. Fall. [2]

RAMT 5301. Medical Physics Seminar I. Radiotherapy treatment techniques and current methodologies in clinical therapy physics. Fall. [1]

RAMT 5304. 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, neutrons, and charged particles. Spring. [3]

RAMT 5311. Clinical Therapy Physics I. Instrumentation and application of physics to clinical radiotherapy procedures, equations for absorbed dose calculations, phantoms, methodologies in computerized treatment planning, and introduction to the special techniques of IMRT, RAPID ARC, and stereoradiosurgery. Fall. [3]

RAMT 5312. Clinical Therapy Physics II. Photon and electron beam algorithms for dosimetry calculations. Methodologies in three-dimensional treatment planning with specific applications to radiotherapy. Spring. [2]

RAMT 5314. Clinical Therapy Physics: Lab I. Introductory laboratory applications of physics to clinical radiotherapy procedures, experience with equipment in a modern clinical radiotherapy environment, and methodology and techniques for the verifications of simulated clinical procedures. [2]

RAMT 5315. Clinical Therapy Physics: Lab II. Advanced laboratory applications of physics to clinical radiotherapy procedures, experience with radiotherapy physics equipment including measurement of absorbed dose using multiple dosimetry systems and techniques for the quality assurance verification of special radiotherapy clinical procedures. [2]

RAMT 5316. Brachytherapy Physics. Instrumentation and applications of physics to clinical brachytherapy procedures, equations for absorbed dose calculations including TG#43, methodologies in computerized treatment planning, and introduction to special techniques. [3]

RAMT 5390. Master's Independent Study (Therapeutic). Introductory problem-solving topic in therapy medical physics including data taking, analysis, and write-up. [1-2]

RAMT 5391. Medical Physics Therapeutic Practicum I. Experience and training in a radiotherapy physics clinical setting; treatment planning, instrumentation calibration, and quality assurance. This course also includes radiotherapy patient interaction, clinical conference attendance, and review of treatment techniques in radiation oncology. Fall, Spring, Summer. [1-4]

RAMT 5392. Medical Physics Therapeutic Practicum II. Experience and training in a radiotherapy physics clinical setting; treatment planning, instrumentation calibration, and quality assurance. This course also includes radiotherapy patient interaction, clinical conference attendance, and review of treatment techniques in radiation oncology. Fall, Spring, Summer. [1-4]

RAMT 5393. Doctoral Independent Study I. Advanced problem solving in therapy medical physics including literature survey, data taking, analysis, and manuscript submission. [1-3]

RAMT 5394. Doctoral Independent Study II. Advanced problem solving in therapy medical physics including literature survey, data taking, analysis, and manuscript submission. [1-3]

RAMT 5395. Medical Physics Clinical Rotations I. Advanced experience and clinical training in a radiation oncology department setting; treatment planning, instrumentation calibration, quality assurance, and problem solving. For third- and fourth-year doctoral students. Fall, Spring, Summer. [3-6]

RAMT 5396. Medical Physics Clinical Rotations II. Advanced experience and clinical training in a radiation oncology department setting;

treatment planning, instrumentation calibration, quality assurance, and problem solving. For third- and fourth-year doctoral students. Fall, Spring, Summer. [3-6]

RAMT 5397. Medical Physics Clinical Rotations III. Advanced experience and clinical training in a radiation oncology department setting; treatment planning, instrumentation calibration, quality assurance, and problem solving. For third- and fourth-year doctoral students. Fall, Spring, Summer. [3-6]

RAMT 5401. Medical Physics Seminar II. Topics in clinical therapy physics, techniques and application. Fall. [1]

Public Health

Courses leading to the Master of Public Health

PUBH 5501. Epidemiology I. This course focuses on measures of disease frequency and association, observational study design, and diagnostic and screening tests. The course reviews the use of these tools and the role of epidemiology in measuring disease in populations, estimating risks, and influencing public policy. Study designs reviewed include cross sectional, ecologic, case-control, and cohort studies. This course is required for all students in the M.P.H. program. Enrollment is limited due to space restrictions, with priority given to global health students in the M.P.H. program.

PUBH 5502. Biostatistics I. This course addresses basic concepts and methods of biostatistics, including data description and exploratory data analysis, study design and sample size calculations, probability, sampling distributions, estimation, confidence intervals, hypothesis testing, nonparametric tests, analysis of continuous, categorical, and survival data, data analysis for cohort and case-control studies, relative risk and odds ratio estimation, and introduction to linear and logistic regression. This course is required for students in the M.P.H. program. Enrollment is limited. Fall. [4]

PUBH 5508. Epidemiology II: Non-randomized Study Design. This course addresses the design of non-randomized studies and factors that are important in design selection. This includes the design of cohort studies, prospective and retrospective cohort studies, assembly and follow-up of the cohort, exposure measurement, outcome ascertainment, confounders, effect modification, calculation of measures of occurrence and effect, summary of multivariate statistical analyses for cohort studies; the case-control study, conditions necessary for validity of the case-control study, selection of controls, sources of bias in case-control studies, and multivariate analysis; as well as the ecological study, including when to use and when to avoid. The course includes didactic lectures and critical reading of important epidemiologic studies from the current medical literature. This course is required for students in the Epidemiology track of the M.P.H. Program. Prerequisite: Epidemiology I, Biostatistics II, Clinical Trials, or approval of instructor. Enrollment is limited due to space restrictions, with priority given to students in the M.P.H. and M.S.C.I. programs.

PUBH 5509. Biostatistics II. This course addresses modern multivariate analyses based on the concept of generalized linear models. This includes linear, logistic, and Poisson regression, survival analysis, fixed effects analysis of variance, and repeated measures analysis of variance. The course emphasizes underlying similarity of these methods, how to choose the right method for specific problems, common aspects of model construction, and the testing of model assumptions through influence and residual analyses. This course is required for students in the Epidemiology and Health Policy tracks of the M.P.H. program. Prerequisite: Biostatistics I or consent of the instructor. Enrollment is limited due to space restrictions, with priority given to students in the M.P.H. program.

PUBH 5512. Decision Analysis in Medicine and Public Health. Offered every other year, this course provides an overview of qualitative and quantitative decision making with a dominant focus on quantitative techniques, using clinical and economic endpoints and their role in clinical strategies of care and health policy. Topics include: cognitive heuristics, Bayes' theorem, ROC analysis, the study of diagnostic tests, meta-analysis, health states and utility measurement using expected value decision making, decision tree analysis, Markov processes and network simulation modeling, quantitative management of uncertainty, cost theory and

accounting, cost-effectiveness and cost-utility analysis. Prerequisite: Epidemiology I, Biostatistics II, Clinical Trials, or approval of instructor. Enrollment is limited due to space restrictions, with priority given to students in the M.P.H. and M.S.C.I. programs.

PUBH 5516. Public Health Practice. This course will provide an overview of public health surveillance as a lens to public health practice, in terms of how public health programs are organized, financed, and operated and what surveillance data are available to inform specific programs. Public health practitioners and policy makers who plan, implement, and evaluate infectious disease, chronic disease, impact of toxic substances in the environment, injury, and disability prevention and control programs have a need for reliable information about the status of these health problems among the populations they serve. Surveillance systems provide information for action. Analyzing, interpreting and using public health surveillance data inform the design, operation, and delivery of public health programs and target public health action in terms of disease prevention and control. Public health surveillance is the ongoing process that public health agencies use to collect, manage, analyze, interpret and disseminate this information. We will review basic approaches to public health surveillance, including disease reporting regulations and notifiable diseases, surveillance for infectious diseases, chronic diseases, and adverse events, uses of surveillance data, and how surveillance data can inform public health program, policy, and practice. In addition to in-depth lectures on surveillance strategies, the course will introduce students to key concepts and methods in Environmental Health, including basic environmental epidemiology, use of evidence in policy and practice and an overview of the main environmental exposures in the U.S. and around the world. Public Health Practice will be taught by a multidisciplinary group of faculty using didactic and interactive elements of instruction.

PUBH 5517. Grant Writing. This course provides a foundation in grant writing for the early career scientist or public health practitioner. It includes seven core sessions, nine elective sessions (from which students must choose at least four), and a mock grant review experience. Core topics include an overview of funding agencies and award mechanisms, as well as how to identify funding opportunities, plan an application, construct an impactful research plan, develop a budget, and succeed at grantsmanship. Elective sessions discuss applying for specific types of grants including career development, global health, health policy, and programmatic awards; VUMC institutional awards and resources; VA grants; NIH biosketch development; research mentorship; and training in the responsible conduct of research. Students will also learn how grants are reviewed and scored, and participate in a mock grant review, choosing either career development award applications or programmatic grants. Enrollment is limited to students in the M.P.H. and M.S.C.I. programs, or by permission of the instructor.

PUBH 5518. Research Ethics. This course presents issues in the responsible conduct of research, including ethics, data management, research fraud, academic misconduct, and conflict of interest. The course covers federal and institutional guidelines regarding research in human and animal subjects. Topics include vulnerable populations in research, confidentiality, and the Institutional Review Board (IRB). The course is required for students in the epidemiology and health policy tracks of the M.P.H. program. Enrollment is limited to students in the M.P.H. and M.S.C.I. programs, or by permission of the instructor.

PUBH 5520. Introduction to Health Policy. The aim of this course is to provide students with an overview of the U.S. health care system and key features of its financing and delivery. We will discuss the strengths and weaknesses of our health care system, historical trends, and how we compare to other countries. Moreover, we will discuss the major components of the Affordable Care Act and implementation challenges going forward. Drawing on materials from different academic disciplines, including economics, political science, and sociology, the course will place particular emphasis on analytic approaches to evaluate policy impact. The course will address a range of topics, including the structure of the delivery system, drivers of spending growth, quality of care, and long-term care. No disciplinary background is assumed, nor is any special familiarity with the field of health care required.

PUBH 5521. Survey Research Seminar. The Survey Research Seminar is a didactic and participatory graduate-level class. It is designed to introduce key concepts and skills in survey methodology and the application of those skills to public health research. The course includes content on survey modes, sampling, questionnaire development, and survey implementation. The student will develop a research question, recruitment materials, and a short questionnaire based on the theory and skills learned in the course. This course is required for students in the M.P.H. program.

PUBH 5522. Qualitative Health Research Methods I. This course is designed to provide an introduction to qualitative research methods, with a focus on research in health behavior, health care delivery, and sociocultural norms that impact health and well-being, although these methods can be applied easily to other arenas. The primary skills we will develop include techniques of the case study method; including interviews, focus groups, and observation. Introductions to mixed methods will also be included. We will also consider strategies for validity and reliability, and the relevance of standard evaluative criteria such as objectivity, neutrality, and generalizability. This course is required for students in the M.P.H. program.

PUBH 5523. Qualitative Health Research Methods II. This course is an extension of the one credit hour Qualitative Health Research Methods I course. During this course, students will pilot, refine, and employ their own qualitative interview guide to collect qualitative data. Students will receive qualitative data analysis training and will undertake to analyze the data from their pilot. The final project will include a write-up of the methods, data analysis, and discussion of findings. This course is an elective for students in the M.P.H. program. Prerequisite: Qualitative Health Research Methods I.

PUBH 5524. The Science of Health Behavior. This course will provide an overview of social and behavioral science theories that are currently used to (a) understand health behaviors; and (b) guide the development of interventions to prevent, reduce, or eliminate major public health problems. We will also explore how technologies (i.e., patient portals, mobile devices, and the Internet) are used to promote health behaviors, disparities in the performance of health behaviors, and how behavioral interventions attempt to address and reduce these disparities. This course is required for all students in the M.P.H. program.

PUBH 5525. Health Economics. This course is intended to survey the major topics in Health Economics. Each class is organized around a topical theme: those themes include health reform, health insurance, health promotion and disease prevention, and the health care workforce. Each theme will be approached from an economic perspective using recent articles from the literature. This course is required for students in the health policy track of the M.P.H. program.

PUBH 5526. Global Health Project Development. This course focuses on development of the individual student's M.P.H. practicum and thesis including the identification of a key global health question and design of a suitable project to address the question. Each student will complete a relevant skill-process activity, a draft of his/her practicum agreement, and a project development concept paper. Enrollment is limited to students in the M.P.H. program.

PUBH 5527. Protocol Development I. This course is designed to prepare students to plan and conduct an independent thesis research project. Students will strengthen their ability to assess whether a research strategy appropriately addresses study questions, with an emphasis on evaluating data sources, study population, measurement, and analysis approach. They will also develop management and logistical skills necessary for conducting public health research. Enrollment is limited to students in the M.P.H. program.

PUBH 5528. MPH Project Extension. Fall, Spring, Summer. [0] Staff.

PUBH 5530. Protocol Development II. This course focuses on development of the individual student's research protocol. Each student will present the background, methods, and limitations of their proposed research design in class, and complete the research protocol for the M.P.H. master's thesis. Enrollment is limited to students in the M.P.H. program.

PUBH 5536. Public Health Practicum. Required as part of the M.P.H. program, the public health practicum is intended to give students the

opportunity to develop practical skills and competencies in public health practice settings.

PUBH 5537. Health Services Administration: Health Care Systems. This course provides an overview of the organization, financing, and delivery of health care. It addresses the complex interrelationships among key stakeholders in the industry, how this structure has evolved over time, and how these system-wide challenges are likely to affect health care policy in the future. This course is also listed as MGT 6504.

PUBH 5538. Health Services Administration: Program and Policy Evaluation. This course addresses the evaluation of changes in the health care delivery system, either through programs specifically implemented to achieve such changes or through changes in health care delivery/financing policies. The primary designs—before/after, concurrent/retrospective control, interrupted time-series—and their strengths and limitations. The course includes didactic lectures and small group critical reading/presentation of current program/policy evaluations published in leading medical journals. This course is required for students in the health policy track of the M.P.H. program. Prerequisite: Epidemiology II, Biostatistics II, or approval of instructor.

PUBH 5540. Health Services Administration: Leadership and Management in Global Health. This course introduces students to principles of management and leadership of global health programs and organizations in complex and challenging environments. Students will explore diverse health systems, organizational behavior, health policy, program design, and core management techniques. Required for students in the global health track of the M.P.H. program.

PUBH 5541. Essential Skills in Global Health. This course introduces students to core research, field tools, assessment and implementation techniques, and evaluation methodologies commonly used in the field of global health. Students explore theories and practices used to analyze issues and intervene in global health and they examine determinants of global health and development from an interdisciplinary vantage point. Health and developmental issues across nations and cultures that require collective, partnership-based action are highlighted. The course is taught by an interdisciplinary team of faculty members using didactic, interactive and practical elements of instruction. This course is required for students in the global health track of the M.P.H. program and may be taken as credit toward the graduate certificate in global health.

PUBH 5542. Foundations of Global Health. This course introduces students to key topics, concepts and methods in global health, examining determinants of complex issues and multi-dimensional approaches and interventions with a particular emphasis on low-resource settings. Taught by an interdisciplinary team of faculty members, this course uses didactic, interactive and practical elements of instruction to address international and cross-cultural health and developmental issues. At the conclusion of the course, students should be able to discuss major topics in global health and design suitable projects that address global health challenges. This course is required for students in the global health track of the M.P.H. program and may be taken as credit toward the graduate certificate in global health.

PUBH 5543. Informatics for Global Health Professionals. With an emphasis on global health settings, this course introduces students to medical informatics and the use of innovative technologies for the storage, retrieval, dissemination, and application of biomedical knowledge. As global health bridges both patient care and public health, so informatics in this context covers both patient-based information systems and public health information systems. International cooperation on health information system issues has resulted in both extensive knowledge repositories and a powerful set of tools and techniques that can be used by practitioners and researchers. The course consists of lectures with discussion and analysis as well as hands-on instruction with some software applications and electronic resources. This course is offered as an elective for students in the global health track of the M.P.H. program and may be taken as credit toward the graduate certificate in global health. [1]

PUBH 5544. Ethics in Global Health. This course provides an overview of ethical issues and standards in global health, particularly with respect to ethics in international research. Its aim is to provide students in the health

professions and others interested in global health with a framework in which to recognize, examine, resolve, and prevent ethical conflicts in their international work. Through readings, lectures and discussion, students will explore diverse historical and contemporary international perspectives on the concepts of ethics and health as well as formulating recommendations for prevention and resolution of ethical conflicts related to global health. This course is required for students in the Global Health track of the M.P.H. program and may be taken as credit toward the graduate certificate in global health. Spring.

PUBH 5549. Case Studies in Tropical Diseases. This course introduces tropical diseases and parasitology in a clinical case study format with student group leadership that is facilitated by faculty with substantial front-line tropical medicine training and experience. Written case protocols will be presented by faculty members and Infectious Disease fellows/Internal Medicine residents who will lead an interactive discussion involving pathophysiology, clinical presentation, differential diagnosis, diagnosis and treatment. This course may be taken as elective credit toward the M.P.H. and the graduate certificate in global health. Summer.

PUBH 5550. Global Health Politics and Policy. Global Health Politics and Policy introduces core global health problems facing the world's populations today and examines the efforts taken to improve health at a global level. It focuses on the social and political movements of global health issues and how these forces created and shaped global health policy both in the U.S. and among the G8 nations from 2000-2011. This course may be taken as elective credit toward the M.P.H. and the graduate certificate in global health. Spring.

PUBH 5555. Global Health Nicaragua. This twelve-week course is designed to expose students to the basic health care systems of Nicaragua centered around a one-week trip to the country in August. Students will gain a basic understanding of the health care disparities between Nicaragua and Nashville; understand the role of a visiting health care provider in global health stewardship; understand the role of DM, HTN, and nutrition among the Nicaraguan people. Students will work to educate Nicaraguan patients in diabetes, nutrition and cardiovascular health, and will educate the Vanderbilt community through a poster session upon their return. The class will be composed of didactic and small group case-based learning, several small group project designs, journal club, and clinic observation, culminating in a poster session. Pre or corequisite: Basic knowledge of Spanish or the Medical Spanish elective. This course is open to students in graduate degree programs in the School of Medicine and School of Nursing. The application process begins in January 2016. Interested students should contact the course instructors directly.

PUBH 5556. Laboratory Technologies in Low-Resource Settings. This course addresses core laboratory principles, technologies, and applications used in the delivery of care and the performance of clinical research in resource-limited settings. It covers strengths, limitations, and appropriate use of laboratory technologies in the changing landscape of international research and clinical care. This course is offered as an elective in the Global Health track of the M.P.H. Program and may be taken as credit toward the graduate certificate in global health.

PUBH 5557. Protocol Development for Global Health. This course focuses on development of the individual student's M.P.H. thesis protocol for the Global Health track. Each student will develop the background, methods, and limitations of their proposed research design in class. In addition, the course will include a one-on-one session with Dr. Yuwei Zhu to review the statistical analysis plan for the thesis work. Each student's thesis adviser(s) will be invited to participate. This course is required for and limited to students in the global health track of the M.P.H. program.

PUBH 5599. MPH Thesis Research I. The primary objective is the completion of the M.P.H. program's thesis. Each student will work independently to coordinate research activities with his or her thesis committee.

PUBH 7999. MPH Thesis Research II. [Formerly PUBH 5519] In this research seminar required as part of the M.P.H. program, second-year students present the results of their master's thesis research. Each 40-minute presentation addresses the background and significance, methods, results, and public health/research implications. Presentations are scheduled through the course director on a first-come, first-served

basis. Before presenting their work, students must obtain the approval of their thesis committee.

Applied Clinical Informatics

Courses leading to the Master of Science in Applied Clinical Informatics

ACI 6110. Introduction to Clinical Informatics. This course provides health care professionals with a basic and practical understanding of fundamental concepts in clinical informatics. Topics covered in the course include a history of biomedical informatics, review health information systems, clinical decision support, quality improvement, consumer health, human-system interactions, and others. Completion of this course will lay the groundwork for subsequent deep study of many of the individual topics covered.

ACI 6111. Foundations of Health Information Technology. This course will provide a strong foundation for understanding the current state and key topics in health information technology. Students will begin with a review of computer programs and systems, and then build on top of this framework detailed information on the structure of health care data and the architecture of supporting systems. Data exchange, interoperability and data networks will be covered, along with key concepts for data security and privacy. Students will use multiple modalities of digital learning, and will participate in projects at different points during the course. Health information technology skills and knowledge will be assessed incrementally throughout the course.

ACI 6112. The Health System. This introductory course provides a broad overview of actors and organizations comprising our health care systems as well as the societal and organizational trends facing consumers, clinicians, executives, and policy-makers. It will provide an overview of some of the major characteristics of the American health care system that in turn drive health care delivery and clinical informatics priorities. Topics will include a historical overview of the American health care system, health care economics and financing, current regulatory issues, and other factors both influencing current informatics initiatives and suggesting future opportunities for innovative informatics solutions.

ACI 6120. Clinical Decision Support and Evidence-Based Patient Care. This course will focus on the design, implementation, and evaluation of clinical decision support features of clinical information systems. Topics to be addressed include cognitive aspects of human decision making, decision science, knowledge management, workflow, evidence-based patient care, and facilitated information retrieval. Many existing CDS examples will be reviewed and evaluated and students will be expected to design a novel CDS as part of their final project.

ACI 6121. Clinical Information System and Applications. The digitization of health care data and delivery of care functionality has been occurring on the small scale for nearly 50 years in clinical information systems. Clinical information systems are comprised of multiple components that comprise clinical information. Beginning in the 1990s, electronic health record (EHR) systems began to emerge as a foundational tool for clinical information systems that brought together various aspects of health care such as billing, documentation, and order entry. By the mid-2000s the basic underpinnings of a comprehensive EHR were understood, but uptake was still very low. This situation changed fundamentally over the past decade and EHRs and related clinical information systems are now ubiquitous. The goal of this course is to provide a framework to understand the underpinnings of modern clinical information systems and the integration of these systems that enable their basic and extended functionalities. Furthermore, with health care consumers having more opportunities to be involved with their health information, we will explore the evolution of consumer informatics. Finally, we will discuss emerging trends in the digitization of health care data including mobile health and telemedicine.

ACI 6122. Workflow, User-Centered Design, and Implementation. The course will cover three main topic areas: workflow, user-centered design, and implementation. Each topic area will include three course segments: principles, methods, and applications. In the principles section for each topic, the course will clearly define terminology related to the topic area (e.g., What is workflow?), review how key concepts relate to each other (e.g., relationship between human factors engineering and

human-computer interaction), and examine the relevance of the topic area in applied clinical informatics. The methodology section for each topic will address qualitative, quantitative, and computational methods used for the design, implementation, and evaluation of health information technology. The applications section for each topic will use case studies based in the topic area to examine the real world application of principles and methods. The course will cover a wide range of contexts, from homes/communities to organizations to a broader regional scale.

ACI 6130. Data to Knowledge (Clinical Data Standards). This course introduces students to fundamental principles about terminologies and data standards and their importance in interoperability and health information exchange. It will focus on clinical data standards with respect to syntactic and semantic interoperability by covering data exchange and messaging standards (e.g., HL7), clinical terminology standards (e.g., SNOMED), document standards (e.g., HL7 CDA).

ACI 6131. Clinical Information System Lifecycle. This course will cover all aspects of designing, implementing and supporting systems. The course will be taught with reference to both the System Development Life Cycle (SDLC) and Information Lifecycle Management (ILM) frameworks. Areas covered will include project conceptualization, methods for requirements gathering, risk analysis and mitigation, total cost of ownership, and implementation and support. Planning and management of disaster recovery and business continuity will also be covered, as well as methods of evaluating effectiveness and return on investment.

ACI 6132. Management and Organizational Change. This course will focus on the management skills needed to direct the informatics activities of large organizations, and to lead changes in technology that may be disruptive. As part of the course curriculum, students will learn leadership models, processes, and practices, effective interdisciplinary communication and team formation, project management, and strategic and financial planning for new clinical information systems.

ACI 7110. Practicum Experience. This course will arrange for students to rotate through health IT operational teams based on their interests and team availability. As part of being embedded in an IT operation, students will be expected to complete limited assignments to advance the team agenda.

ACI 7111. Capstone Project Planning. Students will begin the process of planning for their second year capstone project beginning with a faculty mentor selection, needs assessment and design phase leading up to a formal project proposal and submission of development specifications at the conclusion of the second semester. Project plans will be formally evaluated and will require approval prior to proceeding to implementation and evaluation.

ACI 7120. Practicum Experience. This course will arrange for students to rotate through health IT operational teams based on their interests and team availability. As part of being embedded in an IT operation, students will be expected to complete limited assignments to advance the team agenda.

ACI 7121. Capstone Project Planning. Students will continue the process of planning for their second year capstone project. Project plans will be formally evaluated and will require approval prior to proceeding to implementation and evaluation.

ACI 7210. Practicum Experience. This course will arrange for students to rotate through health IT operational teams based on their interests and team availability. As part of being embedded in an IT operation, students will be expected to complete limited assignments to advance the team agenda.

ACI 7211. Capstone Project Implementation and Evaluations. Based on an approved project plan from the first year, students will implement and evaluate a capstone project in conjunction with a clinical informatics operations team at their home institution. The capstone project is designed to provide students with knowledge and skills required to design and conduct applied research studies to evaluate the efficacy of informatics applications in the clinical environment. Based on personal career objectives and informatics challenges that they identify in practicum course, the capstone project will have the flexibility to be completed

as a group or individually. Each student will have a faculty mentor and, if applicable, a practice mentor within the student's home department/organization.

ACI 7220. Practicum Experience. This course will arrange for students to rotate through health IT operational teams based on their interests and team availability. As part of being embedded in an IT operation, students will be expected to complete limited assignments to advance the team agenda.

ACI 7221. Capstone Project Implementation and Evaluations. Based on an approved project plan from the first year, students will implement and evaluate a capstone project in conjunction with a clinical informatics operations team at their home institution. The capstone project is designed to provide students with knowledge and skills required to design and conduct applied research studies to evaluate the efficacy of informatics applications in the clinical environment. Based on personal career objectives and informatics challenges that they identify in practicum course, the capstone project will have the flexibility to be completed as a group or individually. Each student will have a faculty mentor and, if applicable, a practice mentor within the student's home department/organization.

Arkansas School of Medicine Catalog
2016/2017

Faculty

For an up-to-date list of the current Vanderbilt University School of Medicine faculty, please visit <http://virg.vanderbilt.edu/webtools/registry/>

Archived 2016/2017
School of Medicine Catalog

Index

- Academic policies 42, 58
 Academic program 42
 Accreditation, university 10
 Accreditation, CME 31
 Activities and recreation fees 65, 74
 Activities, extracurricular 19
 Address change 12
 Administration, School of Medicine 7
 Administration, university 6
 Admission, School of Medicine 32
 Advisers 45, 46, 47, 48
 Affiliated clinical education sites 28
 Allied health programs 38, 61, 75
 Alpha Omega Alpha 63
 Alternative transportation 15
 Alumni Hall 19
 Anesthesiology courses 76
 Annual security report 13, 19
 Anti-harassment 16
 Anti-retaliation 16
 Appeals, dismissal 55
 Application procedure 32
 Applied clinical informatics courses 112
 Athletic facilities 20
 Attendance policy 42, 43
 Au.D. 35, 56, 74
 Audiology courses 104
 Audiology, Doctor of 35, 56, 74
 Awards 63
- Barnes & Noble at Vanderbilt 12
 Behavior, standards of 24
 Bicycle registration 15
 Bill Wilkerson Center 30
 Biomedical Ethics, Certificate in 60
 Black Cultural Center, Bishop Joseph Johnson 13
 Board of Trust, university 5
 By laws, honor constitution 23
- Calendar 4
 Campus Security Report 13, 19
 Cancer Center, Vanderbilt-Ingram 29
 Cardiovascular Perfusion Technology 38, 61, 75
 Career Center 11
 Center for Student Professional Development—See Career Center
 Center for Experiential Learning and Assessment (CELA) 29
 Center for Teaching 11
 Certificate programs 60
 Change of address 12
 Chaplain 14
 Child and Family Center 18
 Child Care Center 18
 Children's Hospital 28
 Class day awards 63
 Clinic, The Vanderbilt 28
 Clinical education affiliates, other 31
 Clinical education sites, affiliated 28
 Clinical fellowships 30
 Clinical investigation courses 103
 Clinician assessments of student performance 45
 Colleges, The 46
 Commencement 56, 59
 Committees, selected other, related to medical education 8
 Committees, standing, School of Medicine 7
 Commodore Card 12
- Commons Center 19
 Communications, official university 18
 Compact between teachers and learners 25
 Competencies for learners 26
 Computer resources (VUIT) 12
 Conduct expectations 45
 Confidentiality limits 48
 Confidentiality of student records 13, 17
 Continuing medical education 31
 Continuous professional development office 31
 Core clinical curriculum 49
 Counseling services 15, 47
 Courses of study 76
 Crime alerts 19
- Dayani Center for Health and Wellness, Vanderbilt 30
 Degree and promotion requirements, doctor of medicine 42, 49, 50
 Degree requirements, other degrees 56
 Degrees offered, university 10
 Diabetes Center, Vanderbilt 29
 Diagnostic Medical Sonography 38, 62, 75
 Diagnostic radiology courses 109
 Dietetic Internship Program 39, 62, 75
 Dining services 12
 Directory listings 18
 Disabilities, services for students with 16
 Disability insurance 65
 Dismissal 53, 55
 Diversity Affairs, VUSM Office for 47
 D.M.P. 36, 58, 74
 Doctor of Audiology (Au.D.) 35, 56, 74
 Doctor of Medical Physics (D.M.P.) 36, 58, 74
 Doctor of Medicine 32, 42
 Dual-degree programs 33
 Duty hours, medical student 44
- Eating on campus 12
 Education records 13, 17
 Educational and assistance programs, police department 19
 Education of the deaf courses 106
 Emergency Medicine courses 76
 Emergency phones 19
 Entrance recommendations 32
 Entrance requirements 32
 Equal Opportunity, Affirmative Action, and Disability Services (EAD) 2, 16
 Equity in Athletics Disclosure Act Report 13
 Escort service (Vandy Vans) 18, 19
 Eskind Biomedical Library 14
 Executive faculty, School of Medicine 7
 Expectations for conduct 45
 Experiential Learning and Assessment, Center for (CELA) 29
 Extracurricular activities 19
 Extracurricular work 44
- Facilities of the Medical Center 28
 Faculty 114
 Fees 65, 66, 74, 75
 FERPA 13, 17
 Financial assistance 13, 66, 74
 Financial clearance 65, 74
 Financial information 65, 74, 75
 Foundations of Clinical Care (FCC) 50
 Foundations of Health Care Delivery (FHD) 49
 Foundations of Medical Knowledge (FMK) 50
 Founder's Medal 63

- Global Health, Certificate in 60
 Global health courses 83
 Gold Humanism Honor Society 63
 Grading and promotion, other degrees 59
 Grading policy, doctor of medicine 44
 Grading scales 44
 Graduate certificate programs 60
 Graduate Development Network 11
 Graduate medical education 30
 Graduate programs in hearing and speech sciences 35, 56
 Graduate programs in medical physics 36, 58, 74
 Graduate Student Council 11
 Graduation 53
 Graduation rates 13
 Grievances, student, concerning grades 17, 45
- Health center, student 15
 Hearing and Speech Sciences 35, 56
 Heart and Vascular Institute, Vanderbilt 30
 History, School of Medicine 21
 History, university 10
 Honor code 22
 Honor Council Constitution 22
 Honor system 22
 Honors and awards 63
 Hospital, Monroe Carell Jr. Children's 28
 Hospital, Psychiatric 28
 Hospital, Vanderbilt Stallworth Rehabilitation 28
 Hospital, Vanderbilt University 28
 Hospitalization insurance 16, 66, 75
 Housing 12
 Human Development, Vanderbilt Kennedy Center for Research on 29
- Identification card (Commodore Card) 12
 Immersion phase 50
 Immunization requirements 16, 75
 Information Technology 12
 Inquiry Program 49
 Insurance, disability 65
 Insurance, family coverage 16
 Insurance, hospitalization 16, 66, 75
 Insurance, international students 16
 Insurance, liability 65
 Interdisciplinary studies courses 77
 International Student and Scholar Services 12
 International students 12, 41
- J.D. 34
 Jewish Life, Schulman Center for 14
 Johnson, Bishop Joseph, Black Cultural Center 13
- Kennedy Center 29
 Kissam Center 19
- Laboratory investigation courses 108
 Late payment of fees 65, 74
 Learning communities 49
 Leaves of absence 44, 59
 Lesbian, Gay, Bisexual, and Transgender (LGBT) Health, Certificate in 60
 LGBTQI Life, Office of 14
 Liability insurance for students 65
 Library, Annette and Irwin Eskind Biomedical (EBL) 14
 Library, Jean and Alexander Heard 14
 Light, Rudolph A., Hall 21, 29
 Limits of confidentiality 48
 Loans 73
 Longitudinal requirements 49
- Maintenance of certification 31
 Master of Education of the Deaf (M.D.E.) 35, 56, 74
- Master of Laboratory Investigation (M.L.I.) 36, 56, 74
 Master of Public Health (M.P.H.) 36, 57, 74
 Master of Science in Applied Clinical Informatics (M.S.A.C.I.) 37, 57, 74
 Master of Science in Clinical Investigation (M.S.C.I.) 37, 58, 74
 Master of Science in Medical Physics (M.S.M.P.) 36, 58, 74
 Master of Science (Speech-Language Pathology) (S.L.P.) 35, 56, 74
 M.D./J.D. 34
 M.D./M.A. in Medicine, Health, and Society 35
 M.D./MBA 34
 M.D./M.Div. 34
 M.D./M.Ed. 34
 M.D./M.P.H. 34
 M.D./M.S. in Biomedical Informatics 34
 M.D./M.T.S. 34
 M.D./Ph.D. 33
 M.D.E. 35, 56, 74
 Medical Center North 30
 Medical College Admission Test 32
 Medical education 21
 Medical education and administration courses 84
 Medical Innovators Development Program (MIDP) 33, 51
 Medical physics courses 109
 Medical Research Building III 29
 Medical Research Building IV 30
 Medical Research Building, Ann and Roscoe Robinson 29
 Medical Research Building, Frances Preston 29
 Medical Scientist Training Program (MSTP) 33, 50
 Medical student duty hours 44
 Medical student performance evaluation 55
 Medicine courses 84
 Meharry medical students 41
 Mission statement, School of Medicine 21
 Mission statement, university 10
 M.L.I. 36, 56, 74
 Monroe Carell Jr. Children's Hospital at Vanderbilt 28
 M.P.H. 36, 57, 74
 M.S.A.C.I. 37, 57, 74
 M.S.C.I. 37, 58, 74
 M.S.M.P. 36, 58, 74
 Multiple roles, policy on 48
- Neurodevelopmental Disabilities (NDD), Certificate in 61
 Neurodiagnostic Technology 40, 62, 75
 Neurology courses 88
 Nondiscrimination 2, 16
- Obstetrics and gynecology courses 89
 Ophthalmology and visual sciences courses 90
 Orthopaedic surgery and rehabilitation courses 90
 Osteopathic students 41
 Otolaryngology courses 90
- Parking and vehicle registration 15
 Pathology courses 91
 Pediatric medicine courses 92
 Performance evaluation, medical student 55
 Phase-specific requirements 50
 Physical medicine and rehabilitation courses 95
 Police Department, Vanderbilt University 18
 Portfolio coaches 46, 48
 Portfolio reviews 52
 Post-residency clinical fellowships 30
 Preston, Frances, Medical Research Building 29
 Preventive medicine courses 95
 Probation 53, 54
 Professional doctoral degree in audiology 35, 56
 Professional liability insurance 65
 Program in Interprofessional Learning, Vanderbilt (VPIL) 49
 Progress and promotion, medical student 49, 51, 53, 55
 Project Safe 15

- Progress meetings 53
Promotion committee 52, 54, 55
Promotion, medical student 49, 51, 53, 55
Promotion meetings 54
Promotion, other degrees 59
Psychiatric hospital 28
Psychiatry courses 96
Psychological and Counseling Center 15, 47
Public health courses 110
- Radiation oncology courses 98
Radiology courses 97, 109
Rand Hall 19
Reconsideration of promotion decisions 55
Recreation and sports 20
Recreation and Wellness Center, Vanderbilt 20
Recreation fee 67
Refunds of tuition 65, 74
Registration for degrees other than M.D. 58
Rehabilitation hospital 28
Religious life 14
Requirements for the M.D. 42, 49, 50
Residency training 30
Resources, graduate student 11
Robinson, Ann and Roscoe, Medical Research Building 29
- Sarratt Student Center 19
Satisfactory progress 53
Scholarships 66
Schulman Center for Jewish Life 14
Security alerts 19
Security, campus (Police Department) 18
Security reports 13, 19
Selection factors, entrance 32
Sexual harassment 24
Sexual misconduct 48
Single degree programs, other 35
S.L.P. 35, 56, 74
Special experiences, eligibility for 53
Special program requirements 50
Speech-language pathology courses 106
Sports and recreation 20
Stallworth Rehabilitation Hospital 28
Standards of behavior 24
Standing committees, School of Medicine 7
Strategy and Innovation Office, VUMC 30
Student actions 59
Student government 11
Student health care by VUSM educators, policy on 48
Student Health Center 15
Student health insurance 16, 65, 66
Student health service fee 66
Student Life Center 19
Student records, confidentiality of 13, 17
Student support programs 46
- Surgery courses 99
Suspension 54
- Teacher/learner compact 25
Temporary grades 45
Temporary suspension 54
Therapeutic radiology courses 109
Transcripts 66
Transfer students 33
Transplant Center 30
Tuition and fees 65, 74
Tutoring 46, 47
- University courses 18
University, general information 10, 13
- Vanderbilt Bill Wilkerson Center for Otolaryngology and
Communication Sciences 30
Vanderbilt Child and Family Center 18
Vanderbilt Clinic, The 28
Vanderbilt Dayani Center for Health and Wellness 30
Vanderbilt Diabetes Center 29
Vanderbilt directory listings 18
Vanderbilt Health 100 Oaks 30
Vanderbilt Health Williamson County 30
Vanderbilt Heart and Vascular Institute 30
Vanderbilt-Ingram Cancer Center 29
Vanderbilt Kennedy Center for Research on Human Development 29
Vanderbilt Psychiatric Hospital 28
Vanderbilt Recreation and Wellness Center 20
Vanderbilt Stallworth Rehabilitation Hospital 28
Vanderbilt Transplant Center 30
Vanderbilt University Hospital 28
Vanderbilt University Police Department 18
Vandy Vans 18
Vehicle registration 15
Verification fee 66
Veterans Administration, Tennessee Valley Healthcare System of the 31
Visiting medical students 41
VUMC Strategy and Innovation Office 30
- Wilkerson, Bill, Center for Otolaryngology and Communication Sciences
30
Withdrawal from the School of Medicine 55
Women's Center, Margaret Cuninggim 14
Writing Studio, The 13