

School of Medicine

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Vanderbilt University 2010/2011

Containing general information and courses of study for the 2010/2011 session corrected to 30 June 2010 Nashville

The university reserves the right, through its established procedures, to modify the requirements for admission and graduation and to change other rules, regulations, and provisions, including those stated in this bulletin and other publications, and to refuse admission to any student, or to require the withdrawal of a student if it is determined to be in the interest of the student or the university. All students, full- or part-time, who are enrolled in Vanderbilt courses are subject to the same policies.

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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, Nashville, TN 37240-1809. Telephone (615) 322-4705 (V/TDD); Fax (615) 343-4969.



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School of Medicine Calendar 2010/2011

FALL SEMESTER 2010

Registration and classes begin for 3rd and 4th year MD students / Tuesday 6 July Registration for 1st and 2nd year MD students/ Thursday 29 July to Friday 30 July Classes begin for 1st and 2nd year MD students/ Monday 2 August Fall semester begins for medical master's and other doctoral programs / Wednesday 25 August Labor Day holiday for all classes / Monday 6 September Fall break for 1st and 2nd year MD students / Saturday 16 October to Tuesday 19 October Thanksgiving holiday for all classes / Thursday 25 November to Sunday 28 November Fall semester ends for all MD students / Friday 17 December Fall semester ends for medical master's and other doctoral programs / Saturday 18 December Holiday break for all MD classes / Saturday 18 December to Monday 3 January Holiday break for medical master's and other doctoral programs / Saturday 18 December to Tuesday 11 January

SPRING SEMESTER 2011

Spring semester begins for all MD classes / Tuesday 4 January Spring semester begins for medical master's and other doctoral programs / Wednesday 12 January Spring holidays for 1st and 2nd year MD students / Saturday 5 March to Sunday 13 March Spring holidays for medical master's and other doctoral program students / Saturday 5 March to Sunday 13 March Spring holidays for 3rd year MD students / Saturday 26 March to Sunday 3 April Spring holidays for 4th year MD students / Friday 18 March to Sunday 20 March Instruction ends for 4th year MD students / Friday 24 April Spring semester ends for medical master's and other doctoral programs / Thursday 5 May Instruction ends required courses for 1st year MD students / Monday 9 May Instruction ends required courses for 2nd year MD students / Friday 13 May Commencement / Friday 13 May Emphasis for 1st year MD students / Monday 16 May to Sunday 24 July Instruction ends for 3rd year MD students / Friday 24 June

SUMMER SESSION 2011

Maymester begins for Master of Education of the Deaf program / Monday 9 May Summer session begins for medical master's and other doctoral programs / Tuesday 7 June Summer session ends for medical master's and other doctoral programs / Friday 12 August

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Medical Center Administration

- JEFFREY R. BALSER, M.D., Ph.D., Vice Chancellor for Health Affairs; Dean, School of Medicine
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- NORMAN B. URMY, M.B.A., Vice President, Vanderbilt Health Services
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University Committees

Chemical Safety

The Chemical Safety Committee considers policies and procedures pertaining to the safe handling, transport and use of chemicals and recommends adoption of new or revised policies for the Vanderbilt University Medical Center (VUMC) and Vanderbilt University Campus (VUC) administration through Vanderbilt Environmental Health & Safety (VEHS). It monitors and interprets regulations and/or guidelines of the Environmental Protection Agency (USEPA), the Occupational Safety and Health Administration (OSHA), National Institutes of Occupational Safety Health (NIOSH) and others pertaining to hazardous chemicals and provides technical assistance to Vanderbilt Environmental Health and Safety (VEHS) on these matters. The committee reviews proposed or enacted legislation concerning chemical safety impacting the VUMC and VUC community and informs Departments, Schools and Colleges of legislation, including potential implications and business impact. It assists VUMC and VUC Colleges, Schools and Departments with their internal chemical safety committees and/or programs, in conjunction with Vanderbilt Environmental Health & Safety (VEHS).

Chuck Lukehart, Chair. Todd Graham, Karl Schnelle George Sweeney, Adam List, Ned Porter, Tony Hmelo, Billy Hudson, Fred Guengerich. Administrative and Ex Officio: Bob Wheaton, Andrea George, Kevin Warren, Maralie Exton, David Jones, Jim Slater, Robert Hayes, Michelle Armstrong, Menah Pratt, John Manning.

Institutional Review Board for Human Research Protections

The Institutional Review Board is composed of three Health Sciences Committees, one Behavioral/Social Science Committee, and an administrative support staff. It is the IRB's responsibility to exercise appropriate administrative oversight to assure that Vanderbilt University's policies and procedures designed for the protection of the rights, safety, and welfare of human participants are effectively applied in compliance with its Federalwide Assurance. The Boards review all research proposals involving human subjects for scholarly and scientific merit, risk-potential benefit profile, and legally effective informed consent. Approval of the Board is required prior to the commencement of any human research activities.

Behavioral/Social Sciences Committee

Todd A. Ricketts, Ph.D. (Chair). David Schlundt, Ph.D., (Vice Chair). Lee Bissenger, Juanita Buford, Ed.D., Karen D'Apolito, Ph.D., Benjamin W. Hornsby, Ph.D., Daniel F. Kearns, Psy.D., Ryan J. Kettler, Ph.D., Kathleen Lane, Ph.D., Thomas Lawrence.

Health Sciences Committee, #1

G. Kyle Rybczyk, R.N.C., F.N.P. (Chair). James B. Atkinson, M.D., Ph.D. (Vice Chair). James L. Blair, D.O., Jennifer Bounds, Jennifer Fordham, Vandana Abramson, M.D., Elliot M. Fielstein, Ph.D., Rebecca N. Jerome, M.L.I.S., M.P.H., Lori Ann F. Kehler, O.D., Neeraja Peterson, M.D.

Health Sciences Committee, #2

Steven L. Goudy, M.D. (Chair). Lani A. Kajihara-Liehr, M.S.N. (Vice Chair). Emily Chan, M.D., Ph.D., Rick A. Flores, Timothy D. Girard, M.D., M.S.C.I., James C. Jackson, Psy.D., Geraldine Miller, M.D., James A. S. Muldowney, M.D., Willie A. Sinkfield, M.Div., Mary B. Taylor, M.D.

Health Sciences Committee, #3

James T. Forbes, Ph.D. (Chair). John F. Kuttesch, Ph.D., M.D. (Vice Chair). Kristen Archer, Ph.D., William V. Bobo, M.D., Ph.D., William E. Crowder, D.Min., Allison Dehart, F.N.P., Roger R. Dmochowski, M.D., Burl Johnson, B.S., Paulette M. Johnson, M.D., Saralyn Williams, M.D.

Human Subjects Radiation Committee/Radioactive Drug Research Committee

Ronald Price, Ph.D. (Chair). Dominique Delbeke, M.D., Ph.D. (Vice Chair). Jeffrey Clanton, M.S., B.C.N.P., Bo Lu, M.D., James Patton, Ph.D.

Medical Center Appointments and Tenure Review Committee

The Medical Center Appointments and Tenure Review Committee reports to the Vice Chancellor for Health Affairs. Its membership is made up of representatives from the School of Medicine and the School of Nursing, and the Dean for Graduate Studies and Research. The committee is responsible for review of all appointments and tenure in the medical center.

Members for 2010/2011 have not been determined as of press time.

Vanderbilt University Institutional Animal Care and Use Committee (IACUC)

The VU Institutional Animal Care and Use Committee (IACUC) is responsible for ensuring that all animals in experimental research and teaching, under the jurisdiction of Vanderbilt University and the Veterans Administration Tennessee Valley Healthcare System (VA), are used appropriately and in accordance with the highest standards of humane care, and that research involving animals is conducted in an ethical manner.

The IACUC oversees the institutions' animal care and use program, facilities and procedures, as mandated by the Animal Welfare Act and the Public Health Service Policy.

Committee members include: Ronald Emeson, Chair. Eric Delpire, Vice Chair. Cindy Aslan, Gregory "Dan" Ayers, Chin Chiang, Jeffrey Davidson, Mark Does, Simon Hayward, Kris Hill, Stacey S. Huppert, Spyros Kalams, Ela Knapik, Valentina Kon, Kirk Lane, Steve McElroy, Ray Mernaugh, Dejan Milatovic, Ronald Perry, Pamela Pigg, David Piston, Ambra Pozzi, Jeff Reese, Ana Roe, Earl Ruley, Ken Salleng, Charlotte Sanders, Alicia Turner, Bill Valentine, Jeanne Wallace, Alissa Weaver, Shin Yamazaki, Dwyan Young, and Fiona Yull.

Alternate members include: Yasin Kokoye and Frederich Schuening. Non-voting, ex-officio members include Karen Jackson, John Manning,

Ruth Nagareda, Mike Walsh, Virginia Wiley, and Annette Williams.

VA Academic Partnership Council for the Department of Veterans Affairs, Tennessee Valley Healthcare System (VA TVHS) (formerly Vice Chancellor's Committee for the Veterans Administration)

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. Vanderbilt members are appointed by the Health System Director of TVHS on nomination by the Vice Chancellor for Health Affairs.

Jeffrey R. Balser, M.D., Dean. David Raiford, M.D., Chair. Brian W. Christman, M.D., Janice Cobb, R.N.; Colleen Conway-Welch, Ph.D., C.N.M.; Stephan Heckers, M.D.; Sam Sells, M.D.; R. Daniel Beauchamp, M.D.; William Nylander, M.D.; Donald Brady, M.D.; Michael Doukas, M.D.; Eric Neilson, M.D.; Juan A. Morales, R.N., M.S.N.; Joyce Jones, M.D.; Bonnie M. Miller, M.D.; Emma Metcalf, R.N., M.S.N.

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School of Medicine Administration

- JEFFREY R. BALSER, M.D., Ph.D., Vice Chancellor for Health Affairs and Dean, School of Medicine
- SUSAN WENTE, Ph.D., Associate Vice Chancellor for Research; Senior Associate Dean for Biomedical Sciences
- LYNN E. WEBB, Ph.D., M.B.A., Assistant Vice Chancellor for Health Affairs
- G. ROGER CHALKLEY, D.Phil., Senior Associate Dean for Biomedical Research, Education, and Training
- BONNIE M. MILLER, M.D., Senior Associate Dean for Health Sciences Education
- NANCY J. BROWN, M.D., Associate Dean for Clinical and Translational Scientist Development
- GERALD B. HICKSON, M.D., Associate Dean for Clinical Affairs and Director of the Vanderbilt Center for Patient and Professional Advocacy
- GEORGE C. HILL, Ph.D., Associate Dean for Diversity in Medical Education
- KIMBERLY D. LOMIS, Associate Dean for Undergraduate Medical Education
- DAVID S. RAIFORD, M.D., Associate Dean for Faculty Affairs
- SCOTT M. RODGERS, M.D., Associate Dean for Medical Student Affairs
- JOHN A. ZIC, M.D., Associate Dean for Admissions
- P. DAVID CHARLES, M.D., Assistant Dean for Admissions
- JOHN S. PENN, Ph.D., Assistant Dean for Faculty Development
- J. ANN RICHMOND, Ph.D., Assistant Dean for Biomedical Research, Education, and Training
- CRAIG R. CARMICHEL, M.S., C.P.A., Director of Finance, Academic, and Research Enterprise
- DONALD E. MOORE, JR., Ph.D., Director, Division of Continuing Medical Education
- EMIL R. PETRUSA, Ph.D., Director, Office for Teaching and Learning in Medicine
- VICKY L. CAGLE, Director, Student Financial Services
- JOSEPH M. GOFF, Director, Multimedia Support
- TERENCE S. DERMODY, M.D., Director, Medical Scientist Training Program
- MICHELLE GRUNDY, Ph.D., Assistant Director, Medical Scientist Training Program
- PATRICIA F. SAGEN, Ph.D., Director, Medical School Admissions
- MARILYN O'DELL, M.A., M.S., Registrar
- JANELLE CAREY OWENS, Executive Assistant, Medical School Programs and Special Projects
- JOHN H. SHATZER, Ph.D., Director, Center for Experiential Learning and Assessment

Executive Faculty

Jeffrey R. Balser, Chair. R. Daniel Beauchamp, Randy Blakely, Richard Caprioli, Walter J. Chazin, Alan D. Cherrington, Larry R. Churchill, Richard T. D'Aquilla, Robert Dittus, Alfred L. George, John C. Gore, Jonathan Haines, Heidi Elizabeth Hamm, Frank E. Harrell, Jacek Hawiger, Stephan H. W. Heckers, Jeremy Kaye, Robert L. Macdonald, Mark A. Magnuson, Lawrence J. Marnett, Daniel R. Masys, Lynn M. Matrisian, Robert H. Ossoff, Jennifer Pietenpol, C. Wright Pinson, David W. Piston, David Robertson, Dan M. Roden, Samuel A. Santoro, William Schaffner, Corey M. Slovis, Joseph A. Smith, Paul J. Sternberg, Sten H. Vermund, Michael R. Waterman, Susan Rae Wente. Regular Non-Voting Members: Andrea Baruchin, Gordon Bernard, Nancy J. Brown, Craig R. Carmichel, G. Roger Chalkley, Colleen Conway-Welch, Gerald B. Hickson, George C. Hill, Jeff M. S. Kaplan, Frederick Kirchner, Jr., Bonnie M. Miller, Donald E. Moore, Jr., Linda D. Norman, David S. Raiford, J. Ann Richmond, Scott M. Rodgers, John H. Shatzer, William W. Stead, Jeanne Wallace, Lynn E. Webb.

Standing Committees

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

Admissions

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.

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.

Raymond F. Burk, Chair. Ayman Al-Hendy, Shari Barkin, Jeffrey Canter, David W. Haas, Katherine Hartmann, T. Alp Ikizler, Kirk B. Lane, Ronald M. Salomon, Alan Storrow, Michael W. Vollman. *Ex officio:* Gordon R. Bernard, Italo Biaggioni, Frank E. Harrell, David Robertson.

Faculty Appointments and Promotions

The committee, appointed by the Dean, is responsible for consideration of faculty promotions in the School of Medicine and for examination of credentials of candidates for appointment to faculty positions.

J. Ann Richmond, Chair. Paul Sternberg, Jr., Co-Chair. Naji N. Abumrad, William D. Dupont, Stephan H. W. Heckers, Steven G. Meranze, Geraldine G. Miller, Jean F. Simpson, Roland W. Stein, William F. Walsh. *Ex officio:* David S. Raiford.

Graduate Education

The Graduate Education Committee is the faculty body concerned with graduate student affairs and graduate programs in the medical center.

David M. Miller, Chair. Fred H. Bess, Richard Caprioli, Jin Chen, Louis J. DeFelice, Ronald B. Emeson, Walter Gray Jerome III, Sebastian Joyce, Richard M. O'Brien. Ex officio: G. Roger Chalkley.

Interdisciplinary Graduate Program

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; for reviewing activities and progress of the students in the program and recommending students to the Departments of Biochemistry, Cell Biology, Microbiology and Immunology, Molecular Physiology and Biophysics, Pathology, and Pharmacology for the completion of the Ph.D. degree.

James G. Patton, Chair. Sarki Abdulkadir, Ariel Deutch, Brandt Eichman, Seva Gurevich, Alyssa Hasty, Sebastian Joyce, Charles Lin, David M. Miller, Richard M. O'Brien, Charles Sanders. Ex officio: G. Roger Chalkley, Michelle Grundy.

International Medical Educational Experiences

The International Medical Educational Experiences Committee acts as a channel for exchange of students and faculty in areas of international education.

Mark R. Denison, Robert S. Dittus, Christopher S. Greeley, Jeffry P. McKinzie, Mario R. Rojas, William Schaffner, John L. Tarpley, Sten H. Vermund, George C. Hill. *Ex officio:* Bonnie M. Miller, Scott M. Rodgers; Janelle Carey Owens, Coordinator.

Medical Center Conflict of Interest

The Conflict of Interest Committee is appointed by and advisory to the Dean of the School of Medicine. It is charged to review individual faculty circumstances where a possible conflict of interest or commitment might exist. The committee makes recommendations to the department chairs and the Dean concerning their review.

David S. Raiford, Chair. Italo Biaggioni, Lonnie S. Burnett, Richard Caprioli, Fred Goad, Thomas P. Graham, Jr., Rebecca R. Keck, Donald H. Rubin, Michael G. Stabin, Alastair J. J. Wood. Ex officio: Kenneth Holroyd, Diana Marver, Leona Marx, Christopher McKinney.

Medical Scientist Training Program Faculty Advisory Committee

The MSTP Faculty Advisory Committee (FAC) 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 FAC, which serves as the School of Medicine Admissions Committee for the MSTP. The FAC includes several institutional leaders and senior scientists with responsibility for M.D. and Ph.D. training.

Terence S. Dermody, Director, Larry Swift, Associate Director, James L. Bills, Michelle M. Grundy, Assistant Directors, H. Scott Baldwin, R. Daniel Beauchamp, Mark R. Boothby, Nancy J. Brown, Bruce D. Carter, Walter J. Chazin, Jonathan Gitlin, James R. Goldenring, Laura A. Lee, Robert L. Macdonald, Eric G. Neilson, Kevin G. Niswender, Jennifer A. Pietenpol, Dan M. Roden, Alissa M. Weaver, P. Anthony Weil, Roy Zent, Mary M. Zutter. Student members: Katy Eby, Aubrey Hunt. Ex officio: Jeffrey R. Balser, Roger G. Chalkley, George C. Hill, Fatima Lima, Bonnie M. Miller, Scott M. Rodgers, Susan R. Wente, John A. Zic.

Medical Scientist Training Program 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.

Terence S. Dermody, Director. Larry Swift, Associate Director. James L. Bills, Michelle M. Grundy, Assistant Directors. Roger G. Chalkley, Chair, Bonnie Miller, David Robertson, Scott M. Rodgers, Susan R. Wente.

Student Promotions Committees

Each promotions 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 for which it is responsible.

Class of 2011

Jayant P. Shenai, Chair. David M. Bader, Tamara L. Callahan, Natasha B. Halasa, Sandra J. Hoesli. Ex officio: George Hill, Bonnie M. Miller, Scott M. Rodgers.

Class of 2012

Charlene M. Dewey, Chair. Ellen Wright Clayton, Joshua C. Denny, G. Walden Garriss III, Alexander A. Parikh. Ex officio: George Hill, Bonnie M. Miller, Scott M. Rodgers.

Class of 2013

Wonder P. Drake, Chair. Colleen M. Brophy, Cynthia S. Gadd, Tyler Reimschisel, Laurence M. Solberg. Ex officio: George Hill, Bonnie M. Miller, Scott M. Rodgers.

Class of 2014

Joe Gigante, Chair. Ron Eavey, Ingrid Mayer, Sandi Moutsios, John WIIliams. Ex officio: George Hill, Bonnie M. Miller, Scott M. Rodgers.

Undergraduate Medical Education

The Undergraduate Medical Education (UME) committee is appointed by the dean and consists of faculty and students. It is charged with the complete management of the undergraduate curriculum, including content, pedagogy, and assessment of both students and the curriculum itself. The committee reports to the dean and the executive faculty, and can offer recommendations for major changes in curricular programs and policies.

The UME executive committee is composed of six department chairs, three from the basic sciences and three from the clinical disciplines. In addition, there is one faculty representative from each of the four years of medical school. The chair of the student curriculum committee also sits on the UME executive committee. The UME executive committee is chaired by a faculty member appointed by the dean. This committee meets quarterly to review courses, to review policy, and to guide the development of new curricular offerings. Each year the UME executive committee sponsors a curriculum summit to share information with all members of the UME committee regarding student and curricular outcomes for that year.

Cathy Fuchs, Chair. James B. Atkinson, Jonathan D. Gitlin, Heidi Hamm, Frank E. Harrell, Marilyn Y. O'Dell, Neil Osheroff, Samuel A. Santoro, Corey Slovis, Anderson Spickard III, Lynn Webb. *Ex officio:* George Hill, Bonnie M. Miller, Emil Petrusa, Scott M. Rodgers, Regina Russell, John Shatzer.

Year Teams consist of the course directors and major teachers responsible for implementation of the curriculum for each of the years in medical school.

Year 1 Team: Neil Osheroff, Chair. Al George, Catherine Pettepher,

- Arthur Dalley, Luc Van Kaer, John Newman, Denis O'Day, Bonnie Miller, Scott Rodgers, James Powers, Lillian Nanney, Terry Dermody, Ban Allos, Toby Fishel, Lynn Webb, Natasha Halasa, Jennifer Najjar, Walter Robinson.
- Year 2 Team: James Atkinson, Chair, Joyce Johnson, Kathy Murray, Joseph Awad, Jeanette Norden, Derek Riebau, Larry Churchill, Denis O'Day, Agnes Fogo, Richard Stein, Stephan Heckers, Walter Smalley.
- Years 3 and 4 Team: Anderson Spickard III, Chair. Joseph Gigante, Steven Eskind, Derek Riebau, Jennifer Green, Matthew Miller, Charles Rush, Ban Allos, Ron Salomon, Amy Fleming.

Year Evaluation Teams consist of faculty members who review and evaluate courses offered in that year of the curriculum.

- Year 1 Evaluation Team: Terry Dermody, Oscar Guillamondagui, Michael Richardson, Jayant Shenai.
- Year 2 Evaluation Team: James Powers, Lynette Gillis, David Kaylie, David Bader, Barron Patterson.
- Year 3 Evaluation Team: Nick Desai, Tamara Callahan, Agnes Fogo, Kenneth Palm, Elizabeth Anne Sastre, Alex Townes.

Medical Center Overview

ANDERBILT University Medical Center (VUMC) has a three-fold mission—the education of health professionals, research in medical sciences, and patient care. This mission is carried out in five primary operating units the School of Medicine, the School of Nursing, The Vanderbilt Clinic, Vanderbilt University Hospital, and the Monroe Carell Jr. Children's Hospital at Vanderbilt, all places in which patients receive exemplary care from physicians and nurses who are creative teachers and scholars.

Members of the faculty participate directly in patient care. Their practice encourages the free flow of ideas among the School of Medicine, the School of Nursing, and the clinical units, facilitating joint research activities. As a result, the medical center can undertake significant, innovative programs that set the standards for health care in the region.

Outstanding patient care and technological innovation have established Vanderbilt's reputation as a leading referral center in the Southeast. Physicians from other states and foreign countries refer to Vanderbilt those patients whose health problems demand interdisciplinary skills and expert knowledge. Consequently, students in the medical center encounter a wider range of diseases than they would be likely to see in many years of private practice.

The Medical Center has combined programs of study with a number of other schools including divinity, business, engineering, and law—and makes possible the Ann Geddes Stahlman professorship in medical ethics as well as interdisciplinary programs in philosophy, religion, and the social sciences.

Through the education of physicians, nurses, biomedical scientists, and technicians in allied health professions—and an overriding concern for the care of patients—Vanderbilt University Medical Center strives to improve the health of the individual. Through scholarship and research leading to new knowledge about the nature, treatment, and prevention of disease, the medical center contributes to the improvement of the health of our society.

Facilities

Vanderbilt University Hospital

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.

Routinely, more than 25 percent of patients seen in the hospitals are from states other than Tennessee, with the majority coming from Kentucky, Alabama, and Mississippi.

The Monroe Carell Jr. Children's Hospital at Vanderbilt

The Monroe Carell Jr. Children's Hospital at Vanderbilt is a place of hope and healing for patients and their families. Recognized as one of the premier children's hospitals in the nation by *U.S. News and World Report* in 2008, Vanderbilt Children's Hospital cares for the sickest patients in the region and beyond.

Vanderbilt Children's Hospital is the most comprehensive children's hospital in the state, providing pediatric services from neurosurgery, cancer treatments, and organ and bone marrow transplants to repairing broken legs and everything in between. All children regardless of ability to pay are welcomed. Vanderbilt Children's Hospital has the only pediatric emergency department in Middle Tennessee; this department had more than 41,000 visits in FY08, and more than 161,000 patients were seen in outpatient clinics the same year.

Constructed in 2004, the new freestanding Monroe Carell Jr. Children's Hospital at Vanderbilt is filled with state-of-theart equipment and information systems to provide the best treatment for patients and offers a variety of family accommodations to help fulfill its mission of family-centered care. Vanderbilt Children's Hospital is a nonprofit teaching and research hospital that relies on the support of individuals and others to help children get well and on their way.

The Psychiatric Hospital at Vanderbilt

This facility provides provides inpatient, 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.

The Vanderbilt Clinic

The 900,000 square foot Vanderbilt Clinic and Medical Center Easthouses more than 100 medical specialty practice areas, the clinical laboratories, a center for comprehensive cancer treatment, a day surgery center. The clinic was opened in February 1988.

Vanderbilt Stallworth Rehabilitation Hospital

Vanderbilt Stallworth provides comprehensive inpatient and outpatient rehabilitation services for adult and pediatric (age 6+) patients with neurological, orthopaedic, and other injuries, as well as chronic conditions and disabilities. With state-of-the-art treatment technology, the hospital specializes in the treatment of stroke, brain, and spinal cord injury; multiple traumas; amputees; hip fracture; and other diagnoses. A designated Stroke Center of Excellence within its ninetyfour hospital rehabilitation network, Stallworth repeatedly exceeds the national benchmarks for patient satisfaction and functional outcomes. It is also home to the Vanderbilt Center for Multiple Sclerosis. This hospital is a joint venture with HealthSouth Corporation.

Vanderbilt-Ingram Cancer Center

The Vanderbilt Ingram Cancer Center is Tennessee's only Comprehensive Cancer Center designated by the National Cancer Institute and one of only forty such centers in the country. In 2007, the Cancer Center was invited to join the prestigious National Comprehensive Cancer Network, a nonprofit alliance of twenty-one of the world's elite cancer centers collaborating on improving the quality and effectiveness of cancer care for patients everywhere. The center unites nearly 300 physicians and scientists in seven research programs in breast cancer, gastrointestinal cancer, experimental therapeutics, genome maintenance, host-tumor interactions, signal transduction, and cell proliferation, as well as cancer-prevention and population-based research. These scientists generate more than \$180 million in annual support from public and private sources. The center includes a long list of large "team science" grants from the NCI and other sources, including three Specialized Programs of Research Excellence (SPOREs) in breast, gastrointestinal, and lung cancers, the Southern Community Cohort Study, a Digestive Disease Center grant, a Tumor Microenvironment Network grant, a Mouse Models Consortium grant, a Molecular Signatures of Lung Cancer grant, a Clinical Proteomic Technology assessment grant, a Minority Partnership grant (with Meharry Medical College), and a Multiscale Mathematical Modeling for Cancer grant. The center's clinical trials program includes robust work in Phase I drug development and designation by the NCI as sites for Phase I and Phase II clinical trials. The center also boasts several donor-supported research initiatives, including the Frances Williams Preston Laboratories of the T. J. Martell Foundation, the A. B. Hancock Jr. Memorial Laboratory for Cancer Research, the Jim Ayers Institute for Pre-Cancer Detection and Diagnosis, and the Robert J. Kleberg and Helen C. Kleberg Center for Cancer Genetics and Genomics.

Vanderbilt Kennedy Center for Research on Human Development

The mission of the Vanderbilt Kennedy Center is to improve the quality of life of persons with disorders of thinking, learning, perception, communication, mood, and emotion caused by disruption of typical development. It is dedicated to improving the lives of children and adults with disabilities by embracing core values that include the pursuit of scientific knowledge with creativity and purpose; the dissemination of information to 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 nationally designated National Institutes of Health research centers on mental retardation and other developmental disabilities supported in part by the National Institute of Child Health and Human Development. In 2005, it was designated 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. The center brings together scientists and practitioners in behavior, education, genetics, and neuroscience to work together in unique ways to solve the mysteries of development and learning.

Vanderbilt Diabetes Center

The Vanderbilt Diabetes Center provides a comprehensive approach to diabetes. Programs dealing with education and training of students and fellows provide the next generation of caregivers and scholars. Other programs support the diabetesrelated research of more than eighty VUMC faculty members. Several sophisticated core resources are of particular importance in this regard. Finally, the VDC, through the recently established Vanderbilt-Eskind Diabetes Clinic, provides comprehensive clinical care, including addressing complications of the disease, for diabetics of all ages.

Rudolph A. Light Hall

Completed in 1977, 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. Named for Dr. Rudolph A. Light, former professor of surgery and member of the Board of Trust, Light Hall is connected by tunnels to Medical Center North and to the hospital and by bridge to the Medical Research Buildings and the Veterans Administration Medical Center.

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, opened in 1989, is also home to the A. B. Hancock Jr. Memorial Laboratory for Cancer Research and the positron emission tomography (PET) scanner.

The building is linked to Light Hall and shares an underground level with The Vanderbilt Clinic. The Vanderbilt Clinic and the Veterans Administration Medical Center are connected to the Medical Research Buildings by a bridge.

Frances Preston Medical Research Building

This building is named in honor of Frances Williams Preston, President and CEO of Broadcast Music, Incorporated, and was formerly known as Medical Research Building II. The purpose of this building is to consolidate the Vanderbilt-Ingram Cancer Center programs into one primary location with a distinct presence within the Vanderbilt Medical Center campus. The project consists of a new two-story lobby at grade with a patient drop-off area, five office floors, and a conference center floor.

Medical Research Building III

The MRB III building houses sixty-six research laboratories, four teaching laboratories, research support areas, offices, conference rooms, classrooms, and an 8,650-square-foot greenhouse for research and teaching.

The landmark project—a 350,000-square-foot facility designed to promote study between diverse scientific disciplines—is a joint undertaking of the College of Arts and Science and the medical center.

Medical Research Building IV

Medical Research Building IV (MRB IV) adds 389,000 square feet of wet lab space to the medical center campus. The building has two separate but linked parts consisting of a threestory, vertical addition to Light Hall and a seven-story addition above Langford Auditorium. The new facility supports continued growth in VUMC research programs. The project site incorporates the existing Light Hall structure and Langford Auditorium and the existing land area immediately west and behind Langford for a distance of 75 feet to the shared VUMC/ VA property line.

The concrete-framed Light Hall addition, which was completed and occupied in September 2005, is now home to approximately eighteen principal investigators and associated staff. The Langford overbuild, also designed as a concrete frame with an exterior glass skin, was completed in March 2008, while early occupancy of the lab spaces began in the fall of 2007. The exterior skin closely matches the architectural design of the existing Eskind Library. Twenty-four-foot-high concrete trusses span Langford Auditorium and transfer column loads for the upper portion of the new building. The Langford Auditorium exterior is completely enveloped within the new design; the interior of the auditorium has been completely renovated.

Medical Center North

The 21-bed Newman Clinical Research Center, an inpatient orthopaedic unit, and a general-care unit are located in Medical Center North. The complex also houses administrative support services for the hospital and Medical Center.

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 100 Oaks

Opened in spring 2009, this 400,000-square-foot doctors office suite is designed for convenience from easy access off the interstate highway system to easy surface parking, automated check-in, and integrated services, labs, and radiology. It houses twelve specialty clinics, primary care, advanced imaging, and a 70,000-square-foot health and wellness facility.

Vanderbilt Medical Group Williamson County

Vanderbilt Medical Group Williamson County is the largest group practice in suburban Williamson County with nearly 100 physicians in practices ranging from primary care to sports medicine, GI, cancer care, imaging, and pediatrics.

Mary Ragland Godchaux Hall

Built in 1925, Mary Ragland Godchaux Hall is located between the Jean and Alexander Heard Library and MRB III of the Vanderbilt University Hospital. Faculty and administrative offices and research space for the Nursing School are located within this building. Godchaux Hall has recently completed a two-year renovation to update the building infrastructure.

Godchaux Hall contains a state-of-the-art IP-based videoconferencing classroom, four research interview rooms with video and audio recording options, a research observation room with video and audio recording controls, three equipped small seminar/conference rooms, one moderate-size electronic classroom for use with laptops, and an audiovisual-equipped living room. Together with a sunlit atrium connecting the building with others in the nursing complex, Godchaux Hall comprises 34,421 square feet. The facility includes two largeand two medium-size lecture halls, as well as four seminar-size classrooms. All can be quickly equipped for audio and video recording to tape or broadcast via streaming media. All classrooms have permanently installed projection devices and an up-to-date presentation computer. All afford wireless access to the Internet. The four larger halls are equipped with Smart technology at the lectern. The facility has a commons area that brings the total space for the Annex to 13,175 square feet.

Center for Research Development and Scholarship (CRDS). Housed on the fourth floor of Godchaux Hall, CRDS provides research consultation, support, and resources for scholarly and research projects. CRDS assists with grant proposal development, Institutional Review Board application, paper and poster presentation, database management, instrument development, use of computers, literature searches, reference retrieval, and manuscript preparation. CRDS resources are available to all School of Nursing faculty investigators.

Patricia Champion Frist Hall

In 1998, the 20,259-square-foot Patricia Champion Frist building, located adjacent to Godchaux Hall, was completed. This building houses the Frist Nursing Informatics Center, a multi-media classroom with installed networking for seventyfive students, a health-assessment/multi- purpose classroom, a student lounge, a reception area, and fifty faculty offices. Two of the larger classrooms have installed infrastructure capable of video streaming live lectures. Godchaux Hall, the Annex, and Frist Hall are joined by a common Atrium. Thus, the three buildings of the School of Nursing and the Atrium form a self-contained, cohesive instructional and social complex.

The Frist Nursing Informatics Center (FNIC). The FNIC student computer labs, located in Patricia Champion Frist Hall, are equipped with twenty-seven Dell Precision T1500 computers (Intel i5-750 2.66GHz processor with 2 GB of RAM and a 250GB hard drive loaded with Windows XP, a 48X CD-RW/DVD-RW drive, and USB access for a personal thumb drive), two scanners, and three laser printers. An additional eight units are installed in a Testing Lab to accommodate the growth of proctored Web-based testing in a quiet environment. All computers are placed on a three-year rotation cycle. For some courses, students schedule testing dates in order to suit individual needs within a range of dates allowed by course faculty.

A full range of software is available for document preparation; however, fewer tools are available on computers dedicated to testing. Instructional software is also available over the network or via CD/DVDs from the media library. Faculty and students use a Web-based course management system called OAK (Online Access to Knowledge) which is built on Blackboard, for most course communication, group activities, and the sharing of course resources. In addition, two-way synchronous audio and graphic collaboration is available using a Web conferencing system called Centra; and two-way, multi-point IP-based video collaboration is available using a system called Scopia. Experts in graphics, interactive educational design, and information technology are available through the FNIC. Consultation and troubleshooting activities include assistance with design and development of instructional strategies, development of specialized interactive computer-based programs and webpages, design and maintenance of databases, design and development of graphics and instructional materials, video production, and audiovisual editing services. The FNIC implements and maintains quality assurance for School of Nursing webpages and printed materials with assistance from designated departmental staff and program faculty.

Vanderbilt Dayani Center for Health and Wellness

The Kim Dayani Center is a medically based fitness/health promotion center which specializes in the modification of risk factors, including those related to cardiovascular disease, weight management, stress, sedentary lifestyle, and smoking.

Vanderbilt Center for Better Health

The Vanderbilt Center for Better Health's mission is to accelerate change in health care. To accomplish this mission. the center convenes diverse stakeholders to accomplish critical path planning, provides methods for reducing time to results, conducts research through demonstration projects, and supports active learning through sessions that leverage facts during solution design. The VCBH innovation center is one tool used by our clients to achieve this mission and focuses on leveraging our strengths in the areas of strategies and skills for health care and clinician adoption of health information technology. Our research programs include the Regional Informatics Initiative and the Health Care Solutions Group-a think-and-act tank jointly sponsored by Vanderbilt Medical Center and the Nashville Health Care Council. We are currently researching future programs focused on personal health record (PHR) and applications (PHA), as well as consumerism in health care.

Vanderbilt Heart and Vascular Institute

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

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, and throat, and head and neck. Its programs are highly regarded nationally; U.S. News & World Report's 2007 survey of the nation's "Best Hospitals" ranked VUMC's otolaryngology program at number 16 nationally. In 2004, the last time these programs were ranked by U.S. News, the Wilkerson Center's audiology program ranked first among 118 programs and its speech pathology tied for sixth out of 225 other programs.

Vanderbilt Transplant Center

The Vanderbilt Transplant Center 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.

Libraries

The Jean and Alexander Heard Library

This is the collective name for all the libraries at Vanderbilt, which have a combined collection of more than 2.8 million volumes. It comprises the Central, Biomedical, Divinity, Law, Management, Music, Peabody, and Science and Engineering libraries, each of which serves its respective school and disciplines. Special Collections, the University Archives, and the Television News Archive are also part of the library system. The facilities, resources, and services of these divisions are available to all Vanderbilt faculty and staff members, students, and alumni/ae. Most materials are shelved in open stacks and are available to users through Acorn, the library's integrated, automated system. Acorn also provides access to a growing number of full-text journals, as well as indexes and other research resources. Acorn and the library homepage (*www. library.vanderbilt.edu*/) are accessible via the campus network and from workstations in each library.

The Annette and Irwin Eskind Biomedical Library

The Eskind Biomedical Library (EBL) is a modern 78,000-netsquare-foot facility, dedicated in April 1994. The construction of this award-winning library building was made possible by a gift from Vanderbilt Alumnus Irwin Eskind and his wife, Annette. With a staff of forty, the library collects and provides access to materials to support the teaching, research, and service missions of Vanderbilt University Medical Center.

Digital Resources. To facilitate information access at the point of need, EBL's practice philosophy centers on the provision of electronic resources related to medicine, nursing and the biosciences and services that integrate evidence seamlessly into VUMC workflow. EBL's comprehensive, multidimensional Digital Library (www.mc.vanderbilt.edu/ diglib) offers fast, targeted access to online books, journals, databases and websites. Through this portal, EBL provides access to more than 3,754 full-text electronic journal titles, a number that is continually expanding. It also makes available seminal online texts (e.g., Harrison's Online and Nelson Textbook of Pediatrics) in a wide range of biomedical specialties. In addition, EBL offers the Books@Ovid collection which includes 72 titles and AccessMedicine which includes 44 book titles. The library subscribes to a wide variety of information sources to promote evidence-based practice: MDConsult™, STAT!-Ref.[™], and Current Protocols Online are collections of full-text electronic resources. CRL Online (Clinical Reference Library[™]) and EpocratesRX are comprehensive clinical drug information databases. BMJ's Clinical Evidence provides summaries of current knowledge on medical treatment for a range of conditions, developed through literature searching and assessment of systematic reviews. UpToDate® is a database of clinical topic reviews based on clinical evidence. InfoRetriever provides a cross-database search engine and displays fulltext documents from a variety of evidence-based resources, including the InfoPOEMs database. Global Infectious Disease and Epidemiology Network (GIDEON) is an online diagnosis and reference tool for the tropical and infectious diseases, epidemiology, microbiology and antimicrobial chemotherapy fields. Ovid™ Technologies provides access to several databases, including MEDLINE, CINAHL™ (nursing and allied health), Ovid[™] Evidence-Based Medicine Reviews, EMBASE Drugs & Pharmacology[™], and HaPI[™] (health and psychosocial instruments). Multimedia programs, such as A.D.A.M. Online Anatomy[™], support just-in-time education needs.

To promote biosciences research, the library also provides Web access to the ScienceDirect[®] and Web of Knowledge[™] which includes BIOSIS[®], Current Contents Connect[®], ISI-Highly Cited[™] and Science Citation Index Expanded. Access to key National Center for Biotechnology Information resources including PubMed, GenBank[™], Entrez Gene [™], Map Viewer[™], and OMIM[™]. In addition, the medical center information systems are accessible via the Digital Library.

Using its flexible Digital Library shell, EBL has also created specialized Digital Libraries for Children's Hospital, bioresearch, nursing, public health, Vanderbilt School of Medicine, and consumer health users, as well as medical school alumni, to customize the electronic delivery of information to these specific user groups.

Evidence-based Practice Support. The library employs a matrix of strategies to foster evidence-based medicine practice. The EBL provides access to a list (www.mc.vanderbilt.edu/ diglib/ebm.html) of commercially-produced evidence-based databases through a primary navigation button within the Digital Library. This list encompasses critical resources such as UpToDate*; Cochrane Database of Systematic Reviews, Review of Effects and Register of Controlled Trials; HealthGate; ACP Journal Club; and links to globally accessible EBM resources such as the National Guideline Clearinghouse[™]. The site also features EBL's internally-developed EBM databases such as the Clinical Informatics Consult Service (CICS) Evidence Based Site and the Outpatient Clinical Informatics Consult Service (OCICS) Site, which house evidence syntheses created in response to complex clinical queries, and the Pathway/Order Set Literature Locator, which contains expert search strategies and literature summaries to support evidence-based development of clinical pathways and clinical order sets.

EBL has developed proactive mechanisms to integrate evidence into clinical and research workflow through linkages of patient care guidelines within the electronic medical record. Further leveraging VUMC's informatics tools, the library has extended the CICS evidence-provision model to incorporate an evidence-request function into the patient record system to which clinicians can post complex questions and receive an expert summary of the relevant literature. Summaries are integrated into the permanent patient record.

In addition to working as clinical and research informationists, EBL librarians participate in multidisciplinary teams throughout the medical center, supporting a variety of programs such as pathways/order sets development, IRB, and patient information services. EBL team members contribute vetted patient information links addressing diseases/ conditions and lab findings/vital signs to the medical center's online patient portal, MyHealthAtVanderbilt, and the medical center's electronic medical record system, StarPanel,

Programs and Services. The library is committed to service, and its most important resource is the expertise of its staff. Librarians help students, residents, and faculty stay abreast of the latest findings in the literature by actively participating on clinical rounds and providing targeted support to researchers. Bioinformatics support is provided through regular training classes and individualized consultations. Members of the collection development team are available to meet with faculty developing new courses or programs to assess the information needs of those endeavors and determine the most appropriate way to fulfill those needs. EBL assistance with comprehensive literature reviews is available to researchers developing IRB protocols and to IRB protocol analysts.

The library has also established a Patient Informatics Consult Service (PICS) program to provide VUMC patients and their families with the latest in health information. Information provision to this patron group includes comprehensive information packets tailored to patient needs, access to the EBL's consumer health materials collection, and access to the EBL's online Consumer Health Digital Library.

Through AskELIS asynchronous services (Library Information Desk, SearchDoc, the Librarian On Call, and Learning Site), staff expertise is electronically available 24/7. Online knowledge modules provide 24-hour interactive instruction in health science resources and bibliographic management tools. Other services include circulation of books, management of reserve materials, document delivery to obtain needed material held by other institutions, reference and research services, and guidance in the use of new information technologies. As part of the Informatics Center, library staff work in partnership with researchers in the Division of Biomedical Informatics and the Information Management Department to innovate the delivery of health information to Vanderbilt and to the larger regional community.

Just-in-Time Learning Support. The library offers formal orientations and training sessions on electronic resources regularly in the state-of-the-art Training Room. The Training Room features fourteen training stations, a master station for the trainer, and multimedia projection capabilities. Classnet[®], an integrated hardware utility, allows the trainer to assume control of trainees' computers, the multimedia player, and the classroom projector, which facilitates interactive instruction and demonstration. EBL staff also actively exploit opportunities for informal, just-in-time training in all interactions with Medical Center professionals.

EBL has also developed a medical education-focused digital library, Ask GALEN (General Assistance for Learning and Education Needs) that links targeted electronic resources (electronic books, suggested course readings, relevant web sites, etc.) directly to lectures housed in the medical school's web-based course management system. Ask GALEN allows students to move seamlessly between lecture notes and supplementary study materials to support medical education at the point of need.

The EBL provides Medical Center patrons with the computer equipment needed to support their information needs. Most public workstations in the library have the same desktop and functionality as other "shared" workstations throughout the medical center. All fifty-four publicly available computers in the library are connected to the medical center network. In addition, fifteen wireless laptop computers and four wireless Airpanel monitors can be used in the library.

Knowledge Management. EBL has long focused on integrating knowledge management approaches into information provision. A knowledge management focus on designing reusable tools is central to EBL-created tools (*www.mc.vanderbilt.edu/ kmt/index.html*) such as the Learning Framework, the Learning Module Shell, the Publishing and Directory Shells, and the Informatics Center Tools Finder. Moreover, EBL actively seeks opportunities to integrate information into existing medical center tools and processes.

EBL Research. EBL's research interests include integrating evidence into the patient care and research workflow using informatics applications; evaluating and formalizing the informationist concept; education, skills development, and leadership development of librarians; optimal selection and use of information resources; and digital library development. (www.mc.vanderbilt.edu/biolib/research/index.html)

Print Resources. For materials not available in digital format or of historical value, the library maintains a print collection of more than 203,028 volumes, of which about 80,066 are monographs and 122,962 are serials. The library receives ~116 print serial titles and has a small collection of non-print material. Most materials are shelved in open stacks and are available to users through Acorn, the library's web-based catalog. A unique collection of rare books, photographs, and historical items can be found in the Historical Collections Room. The EBL Medical Center Archives is a repository for manuscripts and institutional records reflecting the history of the medical center and the history of medicine. The EBL's Records Center serves as a model archives and records program, providing access to materials with possible long-term administrative and historical value to the institution.

More details are provided at *www.mc.vanderbilt.edu/ biolib/*. The site includes a succinct description of the library's collection, programs and services and a responsibility chart (in the "Who's Who at Eskind" section).

Professional and Supervisory Staff

DEBORAH BROADWATER, M.L.S., Assistant Director for Collection Development

JOHN CLARK, M.S., Health Systems Analyst Programmer

MARK DESIERTO, M.S.L.I.S., Library Intern

MARCIA EPELBAUM, M.A., Assistant Director for Library Operations

GAYLE GRANTHAM, Health Information Specialist

NUNZIA GIUSE, M.D., M.L.S., Director

REBECCA JEROME, M.L.I.S., Assistant Director for Filtering and Evidence-Based Services

TANEYA KOONCE, M.S.L.S., Assistant Director for Web Development QINGHUA KOU, M.S., Health Systems Analyst Programmer
PATRICIA LEE, M.L.S., Assistant Director for Fee-Based Services
FRANCES LYNCH, M.L.S., Associate Director for Administration
JENNIFER LYON, M.L.I.S., M.S., Coordinator, Research Informatics Consult Service
SANDRA L. MARTIN, M.L.S., Ed.S., Ed.D., Assistant Director for Children's Hospital Services

DAN E. MCCOLLUM, Administrative Assistant Director for Auxiliary Centers SHANNON A. MUELLER, M.L.I.S., Librarian

JEREMY NORDMOE, M.A., Coordinator, Medical Center Archives

CHRISTOPHER RYLAND, M.S.I.S., Coordinator for Special Collections NILA SATHE, M.A., M.L.I.S., Assistant Director for Research

MARY H. TELOH, M.A., Coordinator, Historical Collections

PAULINE TODD, M.S., Librarian

MARGARET W. WESTLAKE, M.L.S., Assistant Director for Staff Training ANNETTE M. WILLIAMS, M.L.S., Associate Director

TAO YOU, M.L.I.S., Librarian

JERRY ZHAO, M.S., M.L.I.S., Systems Software Specialist

Affiliated Facilities

Vanderbilt is closely affiliated with the 485-bed Veterans Administration Medical Center—a Vice Chancellor's Committee hospital containing 439 acute-care beds and outpatient facilities.

The Medical Center uses the facilities of Baptist Hospital, Meharry Medical School/Nashville General Hospital, the Luton Community Mental Health Center, the Middle Tennessee Mental Health Institute, the Metro Nashville–Davidson County Health Department, Southern Hills Hospital, and Centennial Medical Center.

Meharry-Vanderbilt Alliance

Established over ten years ago, this nationally recognized historic collaboration between two uniquely diverse medical education institutions and traditions has become a tremendous success. Created to foster a diverse educational and scientific environment, this partnership has focused on clinical science training, academic support, biomedical research and training, and health services initiatives with emphasis on those that affect the disparities between the majority and minority populations. More than fifty students per year from both campuses have shared cross-campus experiences through clerkships, residencies, and fellowships benefiting student curricula and enhancing the academic support infrastructure of both institutions. The initiatives focus on four specific areas: undergraduate medical education, graduate medical education, student affairs, and information management and libraries. Collaborative efforts in research and training yielded over \$40 million in grants in FY07. Joint projects have resulted in 219 publications of which 197 were published post-creation of the alliance. The alliance has created translational and participatory community health initiatives which are benefiting the underserved community. The alliance has also formed a Meharry-Vanderbilt Student Alliance (MVSA) which involves more than 200 students from both campuses in educational, clinical, and community service programs. MVSA is a student-run organization and develops programs suggested by students. MVSA publishes a newsletter three times a year to highlight student activities and interests.

Information Technology Services (ITS)

Information Technology Services (ITS) offers voice, video, data, computing, and conferencing services to Vanderbilt students, faculty, and staff. ITS provides free anti-spyware and antivirus downloads.

ITS maintains and supports VUnet, the campuswide data network that provides access to the Internet, and VUnetID, the authentication service that enables Vanderbilt users to securely identify themselves to many services on VUnet. Those services include YES, Your Enrollment Services; Online Access to Knowledge (OAK); VUspace, the university's network file storage system; and Vmail, the university's email system. Vmail also includes VUmailguard, designed to protect your email from viruses, unwanted mail (spam), and high-risk attachments.

ITS maintains the campus phone (voice) network, including personal phone lines for resident students. Optional services include voice mail and long-distance calls from campus (V-net). ITS also partners with Sprint, Verizon, and AT&T to offer discounts for cellular phone service. For discount information see *its.vanderbilt.edu/cellphone*.

For campus residents, ITS supports ResNet, which provides a direct connection to VUnet and the Internet. Phone and cable television ports are provided in each campus residence. For more information about ResNet, see *digitallife.vanderbilt.edu/ resnetstart.html*. Through the Digital Life initiative, Vanderbilt highlights VUmix, legal, safe, inexpensive, and easy ways to explore and share music and digital content. See *digitallife. vanderbilt.edu* and www.vanderbilt.edu/vumix for details.

ITS offers various conferencing and collaboration services for students. Vanderbilt's blog service offers Wordpress Blogs at *blogs.vanderbilt.edu*. Centra web conferencing, a pilot for Microsoft Office Communicator and Live Meeting, audio and video conferencing via desktop or a Polycom bridge, and the ITS podcast studio are just a few of the services available. See *its.vanderbilt.edu/services/collaboration* for more information.

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

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

Canby Robinson Society

In 1978, Vanderbilt established the Canby Robinson Society in honor of George Canby Robinson, M.D., dean of the School of Medicine from 1920 to 1928. It was through Dr. Robinson's leadership that the teaching hospital and the research laboratories were placed under one roof, thrusting Vanderbilt to the forefront of medical education. His innovation regarding the diversity of the School of Medicine's curriculum, with emphasis on biomedical research and improved health care, is a legacy that continues today.

With a membership of more than 2,500 and thirty-twomember board, the Canby Robinson Society promotes both unrestricted and restricted gifts in support of Medical Center programs. Through the leadership of this group, private support to the medical center continues to grow. The Canby Robinson Society had fifteen M.D. scholars and fourteen M.D./Ph.D. scholars this past year.

Founders Circle

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Dallas, Texas MR. AND MRS. WILLIAM B. SNYDER Dallas, Texas MR. AND MRS. DONALD N. TEST, JR. Dallas, Texas MRS. LYDIA BRYANT TEST Dallas, Texas MR. AND MRS. CAL TURNER, JR. Franklin, Tennessee MR. AND MRS. STEVE TURNER Nashville, Tennessee MRS. LESTER F. WILLIAMS Nashville, Tennessee MRS. DAVID K. WILSON Nashville, Tennessee MR. AND MRS. THOMAS L. YOUNT Nashville. Tennessee Stewards Circle MR. AND MRS. HOWELL E. ADAMS, JR. Atlanta. Georgia MRS. SAM A. BROOKS, JR. Nashville, Tennessee MR. AND MRS. LUCIUS E. BURCH III Nashville, Tennessee DR. KENNETH CHASTAIN Kennewick, Washington MRS. CORNELIUS A. CRAIG II Nashville, Tennessee DR. SARAH H. EDWARDS AND MR. FRANCIS T. PAYNE Dallas, Texas DR. AND MRS. E. WILLIAM EWERS Nashville, Tennessee MS. ELIZABETH FASCITELLI New York, New York DR. AND MRS. GERALD M. FENICHEL Nashville, Tennessee MR. AND MRS. FRANK GARRISON, JR. Nashville, Tennessee DR. AND MRS. WILLIAM A. HEWLETT Nashville, Tennessee DR. AND MRS. JACK E. KEEFE III Pawleys Island, South Carolina MR. AND MRS. LEO KING Henderson, Kentucky DR. AND MRS. JAMES TRUE MARTIN Tallahassee, Florida MR. AND MRS. GLENN H. MERZ Tullahoma, Tennessee MR. AND MRS. WILLIAM C. NOLAN, JR. El Dorado, Arkansas DR. AND MRS. HARRY L. PAGE, JR. Nashville, Tennessee MR. AND MRS. GEORGE RAWLINGS. Louisville, Kentucky MRS. BARBARA L. ROGERS Princeton, New Jersey DRS. JOHN L. AND JULIA E. SAWYERS Nashville, Tennessee MR. SARGENT SHRIVER Washington, D.C. MRS. HILLIARD TRAVIS Nashville, Tennessee DR. AND MRS. JOHN S. WARNER Nashville, Tennessee MRS. ELTON YATES Pinehurst, North Carolina

DR. AND MRS. KARL E. RATHJEN

The 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 Arts in Teach-

ing, 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 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, Master of Science in Nutrition and Dietetics (proposed for fall 2011), Doctor of Nursing Practice.

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

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

No honorary degrees are conferred.

Accreditation

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

Life at Vanderbilt

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

Graduate Student Council

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

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

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 (apphostia.its.vanderbilt.edu/housing/Main/). The referral service lists information on housing accommodations off campus. The majority of rental property is close to the campus. Cost, furnishings, and conditions vary greatly. For best choices, students seeking off-campus housing should visit the office or consult the website by early July 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 school and university registrars immediately. Candidates for degrees who are not in residence should keep the school and University Registrar informed of current mailing addresses. To change or update addresses, go to *registrar.vanderbilt.edu/academicrec/address.htm*.

The Commodore Card

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

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

Eating on Campus

Vanderbilt Dining operates several food facilities throughout campus that provide a variety of food and services. The two largest dining facilities are Rand Dining Center (behind Sarratt Student Center) and The Commons Dining Center. Six convenience stores on campus offer grab-and-go meals, snacks, beverages, and groceries. All units accept the Commodore Card. For hours and menus, go to *www.vanderbilt.edu/dining*.

Obtaining Information about the University

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

Institutional information about Vanderbilt University, including accreditation, academic programs, faculty, tuition, and other costs, is available in the catalogs of the colleges and schools on the Vanderbilt University website at *www.vanderbilt. edu/catalogs*. A paper copy of the *Undergraduate Catalog* may be obtained by contacting the Office of Undergraduate Admissions, 2305 West End Avenue, Nashville, Tennessee 37203-1727, (800) 288-0432, (615) 322-2561, *admissions@vanderbilt.edu*. Paper copies of the catalogs for the graduate and professional schools may be available from the individual schools.

Information about financial aid for students at Vanderbilt University, including federal and other forms of financial aid for students, is available from the Office of Student Financial Aid on the Vanderbilt University website at *www.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/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 *www. registrar.vanderbilt.edu/academicrec/privacy.htm.* Paper copies of this information about educational records may be obtained by writing the Office of the University Registrar, Vanderbilt University, PMB 407701, 2301 Vanderbilt Place, Nashville, Tennessee 37240-7701 or by calling (615) 322-7701. For more information, see "Confidentiality of Student Records" in the following section of this catalog.

Services to Students

Confidentiality of Student Records (Buckley Amendment)

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

The right to inspect and review their education records within 45 days of the day the university receives a request for access. Students should submit to the University Registrar written requests that identify the record(s) they wish to inspect. The University Registrar will make arrangements for access and notify the student of the time and place where the records may be inspected. If the University Registrar does not maintain the records, the student will be directed to the university official to whom the request should be addressed.

The right to request the amendment of any part of their education records that a student believes is inaccurate or misleading. Students who wish to request an amendment to their educational record should write the university official responsible for the record, clearly identify the part of the record they want changed, and specify why it is inaccurate or misleading. If the university decides not to amend the record as requested by the student, the student will be notified of the decision and advised of his or her right to a hearing.

The right to consent to disclosures of personally identifiable information contained in the student's education records to third parties, except in situations that FERPA allows disclosure without the student's consent. 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, 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.

- To parents if the student is a dependent for tax purposes.
- 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.
- Information to a parent or legal guardian of a student 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 twenty-one at the time of the disclosure to the parent/guardian.

The Buckley Amendment provides the university the ability to designate certain student information as "directory information." Directory information may be made available to any person without the student's consent unless the student gives notice as provided for below. Vanderbilt has designated the following as directory information: the student's name, addresses, telephone number, email address, student ID photos, date and place of birth, major field of study, school, classification, participation in officially recognized activities and sports, weights and heights of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended by the student, and other similar information. Any new entering or currently enrolled student who does not wish disclosure of directory information should notify the University Registrar in writing. No element of directory information as defined above is released for students who request nondisclosure except in situations allowed by law. The request to withhold directory information will remain in effect as long as the student continues to be enrolled, or until the student files a written request with the University Registrar to discontinue the withholding. To continue nondisclosure of directory information after a student ceases to be enrolled, a written request for continuance must be filed with the University Registrar during the student's last term of attendance.

If a student believes the university has failed to comply with the Buckley Amendment, he or she may file a complaint using the Student Complaint and Grievance Procedure as outlined in the Student Handbook. If dissatisfied with the outcome of this procedure, a student may file a written complaint with the Family Policy and Regulations Office, U.S. Department of Education, Washington, D.C. 20202; (800) 872-5327.

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

Vanderbilt Directory Listings

Individual listings in the online People Finder Directory consist of the student's full name, school, academic classification, local phone number, local address, box number, permanent address, and email address. Student listings in the People Finder Directory are available to the Vanderbilt community via logon ID and e-password. Students have the option of making their People Finder listings available to the general public (viewable by anyone with access to the Internet), of adding additional contact information such as cellular phone, pager, and fax numbers, and of blocking individual directory items. 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 selecting the address change icon at *https://webapp.mis.vanderbilt.edu/student-search*.

Psychological and Counseling Center

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

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

Career Center

The Vanderbilt Career Center (VCC) serves graduate students enrolled full time in master's or Ph.D. programs interested in pursuing opportunities in industry, government, and/or nonprofits. Students pursuing academic employment should contact their faculty advisers or the departments in which they are currently enrolled for career advising and job search assistance. Graduate students who are undecided about their career goals are encouraged to contact the Vanderbilt Psychological and Counseling Center (VPCC) for career assessment and counseling and then be referred to the VCC for appropriate follow-up. For detailed information about the VCC, go to *www.vanderbilt.edu/career*.

Additionally, the VCC partners with the Peabody Career Center, Owen Career Management Center, and Owen Special Programs to support students enrolled in a professional master's program in Peabody College or in the MS Finance program in the Owen Graduate School of Management who are pursuing their first full-time professional opportunity. Services to these students include access to the VCC job and internship database, industry career days and networking events, and campus recruiting.

Student Health Center

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

The following primary care health services are provided to students registered in degree-seeking status: visits to staff physicians and nurse practitioners; personal and confidential counseling by mental health professionals; routine procedures; educational information and speakers for campus groups; and specialty clinics held at the SHC. Most visits are free of charge, but there are small co-pays for some procedures, and for medications or supplies purchased at the Student Health Center.

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

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

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

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

Immunization Requirements

The State of Tennessee requires certain immunizations for all students (undergraduate, graduate, and professional) on university campuses. As such, Vanderbilt University will block student registration for those who are not in compliance with the requirements. In order to accommodate students who have difficulty acquiring their records or needed vaccinations, incoming students not in compliance with the state laws will be enrolled for their first semester, but if they fail to comply within two months of enrollment, registration for the second semester will not be permitted.

The requirements include:

- . *Meningococcal meningitis vaccine (one injection)* for all incoming students living in on-campus housing. The law does allow a student to sign a waiver stating that he/she does not wish to receive this vaccination (see below).
- 2. *Hepatitis B vaccine series (three injections)* for all incoming students, regardless of housing status. The law does allow a student to sign a waiver stating that he/she does not wish to receive this vaccination (see below).
- 3. *Measles, mumps, and rubella (two 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.

The Student Health Center asks 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 with vaccination or waiver information. Waivers for hepatitis B and the meningococcal vaccine are also included with the Health Questionnaire, should a student decide to forgo these vaccinations. However, waiver of the MMR (measles, mumps, rubella) vaccine requires special documentation of religious or medical exemption so students seeking that waiver should contact the medical director of the Student Health Center at (615) 322-2254.

Students should go to www.vanderbilt.edu/student_health/ link/immunization-requirements in order to access more information regarding the immunization requirements. This site also contains links to the PDFs of the required forms and has information regarding an online entry form that is available for the state-mandated vaccinations.

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 adequate 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 in the Office of Student Accounts or at the Student Health Center.

The annual premium is in addition to tuition and is automatically billed to the student's account. 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 notify the Office of Student Accounts of adequate coverage under another policy. All new and returning students must complete an online selection/waiver process through the Office of Student Accounts (www.vanderbilt.edu/stuaccts) or via the insurance company (www.gallagherkoster.com). 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 6. The online selection/ waiver process indicating comparable coverage **must be completed every year** in order to waive participation in the Student Injury and Sickness Insurance Plan.

Family Coverage. Students who want to obtain coverage for their families (spouse, children, or domestic partner) may secure application forms by contacting the on-campus Student Insurance representative, (615) 322-4688. Additional premiums are charged for family health insurance coverage.

International Student Coverage

International students and their dependents residing in the United States are required to purchase the university's international student 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 form (*www.gallagherkoster.com*) indicating your other insurance information. This online waiver form 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. Information and application forms are provided through the Student Health Center.

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, quality child care, and early childhood education to the children of faculty, staff, and students. The center's website at *www.vanderbilt.edu/HRS/wellness/cfctr. html* provides information on resources for child care, adult care, summer programs (both day camps and overnight camps), tutoring services (including test preparation and skill building), and before and after care. The Vanderbilt Sitter Service connects members of the Vanderbilt community who wish to provide sitting services with those who need the services.

The Child Care Center serves children from six weeks to five years of age and offers placement through a waiting list. Applications may be downloaded from the website.

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. The Equal Opportunity, Affirmative Action, and Disability Services Department also investigates alleged violations of Vanderbilt's nondiscrimination and antiharassment policies. 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; www.vanderbilt.edu/ead.

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.

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 Medical Center, and a variety of university-owned facilities throughout the Davidson County area. Non-commissioned and commissioned officers staff the department. Commissioned officers are empowered to make arrests as "Special Police Officers," through the authority of the Chief of Police of the Metropolitan Government of Nashville and Davidson County. Vanderbilt officers with Special Police Commissions have the same authority as that of a municipal law enforcement officer while on property owned by Vanderbilt, on adjacent public streets and sidewalks, and in nearby neighborhoods.

The Vanderbilt University Police Department includes a staff of more than one hundred people. All of Vanderbilt's commissioned officers have completed officer training at a

state-certified police academy. Those officers hold Special Police Commissions and are required to attend annual in-service, as well as on-the-job training. The department also employs nonacademy-trained officers for security-related functions.

VUPD provides several services and programs to members of the Vanderbilt community:

Vandy Vans—VUPD 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.

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. Additional information about Vandy Vans and specific stop locations can be found at *police.vanderbilt.edu/vandy_vans* or by calling (615) 322-2558.

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 421-8888 (off campus) or 1-8888 (on campus).

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

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

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

Crime Alerts—Crime Alerts are distributed throughout Vanderbilt to make community members aware of significant unsolved crimes that occur at the university. They are distributed by mail, through Vanderbilt email lists, and through the department's webpage, *police.vanderbilt.edu*.

Educational and Assistance Programs—The Community Relations Division 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.

For further information on available programs and services, call (615) 322-2558 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*.

Campus Security Report

In compliance with the Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act and the Tennessee College and University Security Information Act, Vanderbilt University will provide you, upon request, an annual security report on university-wide security and safety, including related policies, procedures, and crime statistics. A copy of this report may be obtained by writing or calling the Vanderbilt University Police Department, 2800 Vanderbilt Place, Nashville, Tennessee 37212 or by telephone at (615) 343-9750. You may also obtain this report on the website at *police.vanderbilt.edu/security_report.*

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

Bicycles must be registered with the Vanderbilt University Police Department.

All Graduate School 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.

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 (*www.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.

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, the Presbyterian Fellowship, the Muslim Student Association, 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 an informal haven for students, with plenty of opportunities for fellowship and food.

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

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 biannual orientation programs for students and ongoing orientations for scholars, who arrive throughout the year.

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

Margaret Cuninggim Women's Center

As part of the Office of the Dean of Students, the Margaret Cuninggim Women's Center welcomes all members of the Vanderbilt community to take part in our events and resources related to women's and gender topics. Our Gender Matters program offers co-curricular programming aimed to increase awareness of the influence that gender has in our lives; in addition, Gender Matters provides individual support and advocacy around a variety of issues, including gender stereotyping, gender equity, body image, eating disorders, pregnancy and reproduction, sexual health, and more. Project Safe is a support and resource referral hub for those affected by power-based personal violence (sexual assault, partner violence, stalking, and bias-related violence). Through the Green Dot violence prevention campaign, we also coordinate a campus-wide effort to involve all members of the Vanderbilt community in creating a safer campus. In addition, the Women's Center houses resources related to gender issues and produces *Women's VU*, a magazine that foregrounds women at Vanderbilt and highlights contributions made for and by women and their allies. The Women's Center is open Monday through Friday, 8 a.m. to 5 p.m. and is located at 316 West Side Row. For more information, please call (615) 322-4843.

Office of LGBTQI Life

As a component of Vanderbilt's Office of the Dean of Students, the Office of Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex (LGBTQI) Life 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. Visitors are invited to use our ever-expanding resource library for research around LGBTQI issues and culture. In addition, LGBTQI Life conducts tailored trainings and consultations for the campus and community. In all cases the office staff provides confidentiality. The Office of LGBTQI Life is located in the K. C. Potter Center, Euclid House, 312 West Side Row. For more information, please call (615) 322-3330.

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*.

Religious Life

The Office of Religious Life provides opportunities for students, faculty, and staff to explore religion, faith, spirituality, personal values, and social responsibility via educational programming, religious and spiritual praxis, encounters with various faith perspectives, and engagement with religious and spiritual communities. The office serves "the religious" and those who identify as "nonreligious." Religious Life is an intellectual home and ethical resource for anyone in the Vanderbilt community seeking to clarify, explore, and deepen understanding of their lives.

Recognizing the importance of exploring one's faith in community, the Office of Religious Life facilitates opportunities for individuals of a shared faith to gather and engage in the rites, rituals, and practices of 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 *www.vanderbilt.edu/religiouslife*.

Extracurricular Activities

Sarratt Student Center

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

Student Life Center

The Vanderbilt Student Life Center (*www.vanderbilt.edu/ studentlifecenter*) 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.

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

The center is also home to Starbucks, the Career Center, International Student and Scholar Services, Health Professions Advisory Office, Office of Honor Scholarships, Office of International Services, and Global Education Office.

Recreation and Sports

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

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

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

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

For additional information, please see www.vanderbilt.edu/ campusrecreation.

Medical Education at Vanderbilt

THE Vanderbilt University School of Medicine seeks to administer a four-year educational program toward the M.D. degree that provides students with the knowledge, skills, attitudes, and habits they will need to practice safe, effective, ethical, evidence-based, and patient-centered medicine in the 21st century. It is grounded in the principle that the health of populations can and should be related to the education of health professionals and is aligned with Vanderbilt's overarching mission to produce leaders and scholars in medicine.

The following topics receive special emphasis in our curriculum: professionalism, cultural competence, communication skills, evidence-based medicine, information technology, interdisciplinary teamwork, lifelong learning, and patient-centered care. These topics run as longitudinal themes throughout the four years of the curriculum.

The medical school's major strength lies in the quality of its students and faculty. The school provides a supportive, positive environment in which students are treated individually in their pursuit of excellence in medical careers. The student body is diverse, with students from a wide variety of major universities nationwide. The medical school has an unusually low attrition rate and its graduates traditionally gain entrance to residency programs of high quality throughout the country.

The faculty, which represents a variety of specialties and many strong research programs, has a national and international reputation for excellence in the biomedical sciences and clinical care. House staff officers who have teaching duties consistently receive commendation for their contribution to the educational program.

Through its core and elective components, the curriculum provides students opportunities to explore the full spectrum of medicine. There is enough structure to ensure consistency and enough flexibility to permit the pursuit of individual interests. The core curriculum of the first two years presents fundamental concepts of biomedicine in an interdisciplinary fashion. Students also take at least three elective courses in order to acquire greater depth of understanding in areas of their interest. Electives cover wide-ranging topics, such as history of medicine and Spanish, and also provide an opportunity to investigate a variety of medical specialties. All students pursue in-depth scholarly projects during the first two years, through the Emphasis Program.

From the 5,000 applications received each year at the School of Medicine, approximately a hundred students matriculate into the first-year class. A hallmark of the School of Medicine admissions process is the personal attention to detail exercised by the administrative staff and the Admissions Committee. The involvement of more than a hundred faculty members in the interview and evaluation process reflects the importance placed on the selection process and leads to a personal interest in each applicant. An important part of the admissions process is the applicant's tour of the medical school facilities with a member of the student body as a guide.

The school seeks to attract qualified minority and disadvantaged students. This goal is based not only on a commitment to equal opportunity, but also on the belief that a diverse student population provides the best learning environment for all students. Medical school is but the beginning of a continuing process. Following graduation from medical school, residency provides a period of further formal training in specialized areas of medicine. For the physician who aspires to a career in academic medicine, additional fellowship training in research is usually needed. The Vanderbilt program in medical education provides a sound basis for the physician graduate to enter any field of medicine. Vanderbilt's commitment to medical education as a lifelong pursuit is supported by programs of continuing education offered to alumni and to physicians practicing locally as well as those practicing in other parts of the country.

Mission of the School

The mission of the Vanderbilt University School of Medicine is:

- To develop outstanding clinicians, scientists, and teachers in an environment that stimulates learning and discovery and cultivates empathy and compassion.
- To advance the knowledge base of medicine by continuing our role as a leading research institution.
- 3. To disseminate knowledge through continuing education of our students, graduates, faculty members, and colleagues.
- 4. To promote exemplary patient care and to serve our local and extended community.
- To maintain our atmosphere of cooperation, collegiality, and mutual respect.
- 6. To recognize individuality and to foster personal growth of all who work and learn with us.

Education

The school's mission includes the education of physicians at all levels of their professional experience: medical school; postgraduate education, including basic science and clinical training; and continuing education for the practicing physician. The faculty seeks to provide students with the attitudes and background, based on sound biomedical science and the core values of the medical profession, to continue their education lifelong. At Vanderbilt, every medical student has access to examples of the highest standards of biomedical investigation and compassionate clinical practice. The desired end is a graduate who has been challenged and stimulated in as many areas of medicine as are feasible within the limits of a fouryear course of study.

Patient Care

A teaching hospital and its associated outpatient facilities constitute a classroom for trainees based on high academic standards. The clinical facility also serves as a laboratory for clinical research. Faculty members, serving as role models for young physicians, teach the practice of exemplary patient care at all levels. Model programs of health care delivery, at primary, secondary, and tertiary levels, fulfill the school's responsibility for community service in its fullest context.

Research

In addition to teaching, members of the medical school faculty have a second and complementary responsibility to generate new knowledge through research. Exposure to an inquiring faculty sparks the spirit of inquiry in students. At Vanderbilt, research encompasses basic scientific questions, issues in clinical care, and problems related to the health care system itself. Vanderbilt is recognized as one of the leaders in research among medical schools in the United States.

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 profession, students pledge to conduct themselves with honor and integrity at all times. Both the Promotions Committees and Honor Council serve to protect the environment of trust created by this Honor System. The Promotions Committees periodically evaluate each student's performance with special attention to work and conduct appropriate for the practice of medicine. The Honor Council serves to educate the student body about their responsibilities 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 Promotions Committee, as the Committee may examine these incidents in the larger context of a student's general performance.

The Honor Code

All students pledge to conduct themselves honorably, professionally, and respectfully in all realms of the medical center and in all 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 preapproved by the course director and made readily available to all other students taking the course. This pledge applies to all course work, examinations, and presentations, or any other activities required for the awarding of the M.D. degree. 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 of the Honor Council

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

- A faculty member shall be appointed by the Dean of the School of Medicine as the Honor Council advisor. His/her roles include ensuring that all the rules are followed. In the case of an accusation, he/she will decide with the chair of the Honor Council whether there is sufficient evidence to proceed with a trial after a formal investigation has been carried out
- 2. The first, second, third, and fourth year classes shall elect two representatives to the Honor Council. These representatives may hold additional offices in the class.
- 3. The vice president of the fourth year class shall be chair of the Honor Council. He or she will appoint the secretary of the Honor Council from among the eight elected representatives.

Article IV—Duties of Officers

- 1. It shall be the duty of the chair 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 his or her office.
- 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.

Article V—Meetings

- 1. One regular meeting shall be held within four weeks of the start of the school year. At this meeting, the chair of the Honor Council and the faculty advisor will explain the duties and procedures of the Honor Council to the members.
- 2. Special meetings may be called by the chair at any time and must be called within ten (10) 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

Five members of the Council of nine shall constitute a quorum.

Article VII—Hearings

- 1. A hearing shall be called by the chair of the Honor Council, if appropriate.
- 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 advisor 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 and any member present at the hearing is not at liberty to discuss them 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. 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 chair has a vote in all decisions unless contraindicated by *Roberts Rules of Order*.
- 7. Written notice of the 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 chair. The Promotions Committee will not be notified unless a verdict of "guilty" has been found. In the case of a "guilty" verdict, the Promotions 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.

Article VIII—Publicity

- 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.
- 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 advisor before becoming final.

Bylaws

Article I—Reporting an Incident

- If a student or 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 the chair of the Honor Council, or
 - B. By way of the faculty advisor who will notify the chair of the Honor Council, or
 - C. To any member of the Honor Council, who will report directly and only to either the chair or the faculty advisor.
- 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.
- Perjury before the Dean or any Honor Council member regarding the reporting of or investigation of an incident is a breach of the Honor Code and is subject to punishment.
- 5. Once an incident has been reported, the chair and the faculty advisor will meet to discuss the incident. The chair may appoint a committee of two members from the Honor Council to investigate the case and report its findings to the faculty advisor and the chair. These two members shall be ineligible to vote. With the advice of the faculty advisor, the chair 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.
- Once the Honor Council is assembled, the accusation will be presented by the chair, and a hearing will be held by the Honor Council.
- A student who reports a personal Honor Code violation will be given consideration for his/her initiative in reporting his/her own transgression. The chair, with advice of the faculty advisor, will decide if an investigation is warranted.

Article II—Penalties

- 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 or 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.
- Penalties may range from the minimum of failure of the assignment to the maximum of expulsion from the 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 appeals petition must be in writing.
- B. It must specify the grounds for appeal.

C. It must be filed within seven class days or exam 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

- The Summer Council will have official functions from the day following university Commencement exercises until the day class registration begins for the fall semester.
- The Summer Council will be composed of the representatives of the rising second through fourth year classes as designated. The eighth and ninth members will be appointed by the faculty advisor from the rising student body.
- In the event that a designated member will not be in Nashville during the summer, then the respective class president should appoint a member of his or her class, who will be in Nashville, to be approved by the Honor Council,.
- 4. In the event that the designated chair will not be in Nashville during the summer, then the faculty advisor should recommend a chair from the members of the Summer Council subject to council approval.

Standards of Behavior for Interactions with Medical Students

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, or being or being perceived as homosexual, heterosexual, or bisexual.
- (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 Medical Center 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;
- 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 perfor mance 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") may 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.

Reporting Procedure

Prior to filing a formal report as outlined below, the individual considering making a report should first, if at all possible, attempt to resolve the matter directly with the alleged offender. In addition, the reporting individual may consult informally

with any member of the Standards Committee for information and assistance. Any such informal consultation will be confidential if so requested. The only written record of any such confidential consultation shall consist of a confidential memorandum retained in the files of the Chair of the Standards Committee.

To make a formal report of an alleged violation of these Standards, a written description of the alleged violation, signed by the individual making the report, shall be delivered to any individual on the Standards Committee. The Standards Committee shall conduct a preliminary investigation, giving the reporting individual, the alleged offender and any other persons as the Standards Committee shall determine a fair opportunity to express their views on the matter. Further, the Standards Committee shall make, in accordance with commonly held standards of conduct, any necessary preliminary determination of what does or does not constitute reasonable or appropriate conduct and behavior. Thereafter, the Standards Committee shall issue a written statement of their preliminary findings to the individual making the report, to the alleged offender, and to the Dean. The Dean shall then take such further action on the matter as the Dean shall deem appropriate, consistent with Vanderbilt University policy on disciplinary actions as set forth in the Vanderbilt University Faculty Manual, Student Handbook, or Staff Manual, as applicable.

Alternatively, a student alleging sexual harassment or unlawful discrimination may make a complaint to Vanderbilt's Equal Opportunity, Affirmative Action, and Disability Services department in accordance with the procedure outlined in the *Student Handbook*. If the complaint to the Equal Opportunity, Affirmative Action, and Disability Services department does not resolve the matter to the satisfaction of the individual making the complaint, a formal grievance may be filed with the Office of the Chancellor in accordance with the procedure in the *Student Handbook*.

Competencies for Learners across the Continuum

The following set of core competencies was adopted by the Undergraduate Medical Education Committee in May 2009. 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 replace the thirty learning objectives that previously guided our curricular efforts and are based on the six ACGME competencies that guide learning throughout postgraduate medical education.

I. Medical Knowledge

Competency statement: 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 demonstrate the following at a developmentally appropriate level:

- 1. Understanding of 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.
- 2. Understanding of the sciences essential for one's chosen field of practice.

- 4. Knowledge of the sciences underlying the common and important health and wellness issues affecting our society and other societies around the globe.
- 5. An appreciation for the importance of the sciences that underlie the effective practice of medicine and a resulting commitment to maintain an up-to-date fund of knowledge through continuous learning.
- 6. Knowledge of the scientific method, reproducible research, and experimental designs that are valid for the question of interest, and an understanding of how to collect, analyze, and interpret new information to enhance knowledge in the various disciplines related to medicine.

II. Patient Care

Competency statement: 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 demonstrate at their developmentally appropriate level the following:

- 1. Ability to perform a problem-focused or complete history and physical examination as indicated, and to obtain necessary diagnostic studies, including imaging, laboratory, and procedural tests.
 - Ability to interpret clinical information and formulate a prioritized differential diagnosis that reflects the use of medical knowledge in a probabilistic reasoning process.
- 3. Ability to formulate a management plan based on evaluation of the scientific evidence as well as on the patient's values, cultural background, beliefs, and behaviors. This requires the ability to critically review the literature with an understanding of the levels of evidence provided by typical experimental or study designs, measurement techniques, and analyses. Students should be able to recognize common forms of bias.
- 4. Ability to implement a comprehensive management plan that would include performing indicated procedures within the scope of one's training.
- 5. Ability to use knowledge support tools such as evidencebased diagnostic criteria, management guidelines, and point-of-care information resources.
- 6. Ability to use 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.
- 7. Ability to exercise clinical judgment that is safe and commensurate with the level of training.
- 8. Ability to re-examine and address prior decisions when desired outcomes are not achieved and/or the patient is dissatisfied.

III. Interpersonal and Communication Skills

Competency statement: 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 demonstrate the following at a developmentally appropriate level:

- 1. Understanding of 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.
- 2. 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.
- 3. Understanding of the elements of a validated providerpatient communication model, and the ability to demonstrate appropriate components of the model during patient interactions.
- 4. Understanding of the strengths, limitations, and appropriate applications of various communication modalities, including verbal, non-verbal, written, electronic, graphic, synchronous, and asynchronous modalities.
- 5. Understanding of the challenges and opportunities created by cross-cultural communications and their potential impact on patient care, health disparities, and health outcomes, and the ability to engage support systems that facilitate cross-cultural communication.
- 6. Understanding of the elements of effective team building and the ability to use appropriate techniques to create, participate in, and lead effective teams.
- The ability to establish and utilize effective communication strategies with patients, families, and health care colleagues, regardless of their cultural backgrounds.
- The ability to build and sustain effective relationships in a wide variety of settings and with persons from diverse backgrounds.
- 9. The ability to effectively manage interpersonal conflict and to provide and receive constructive feedback.
- 10. The ability to disclose medical error to patients, families, and health care providers in a manner that is truthful, sensitive, responsible, constructive, and supportive.

IV. Professionalism

Competency statement: 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 demonstrate the following at a level appropriate to their educational attainment:

- 1. Understanding of the duties and obligations of the medical profession, its health care institutions, and its individual practitioners to patients, communities and society.
- 2. Commitment to the primacy of the patient in all health care endeavors.
- 3. Commitment to work for a more just health care system, including the ability to advocate effectively on behalf of individual patients and patient populations.

- 4. Understanding of the principles of biomedical ethics and skill in applying these principles in practical contexts.
- 5. Commitment to honesty and transparency in all dealings with patients, learners, and colleagues.
- 6. Commitment to the professional and legal standards that safeguard patient confidentiality.
- 7. Understanding of the concepts surrounding conflict of interest and competing priorities, and the ability to identify and manage these in ways that maintain the primacy of patient interests and the health of the public.
- 8. Compassion and respect for all persons regardless of differences in values, beliefs and experiences.
- 9. Awareness of the vulnerability of patients and the inherent power differentials in organizational and interpersonal relationships including, especially, understanding of the boundaries that define therapeutic relationships.
- 10. Commitment to excellence in all professional endeavors.

V. Practice-Based Learning and Improvement

Competency statement: 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 must demonstrate:

- Ability to 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.
- 2. Continuous pursuit of knowledge regarding best practices and optimal patient outcomes.
- 3. Ability to compare data about current performance at the individual, team, and/or systems level with expected out-comes, and identify and implement the learning strategies needed to improve performance.
- 4. Ability to develop and implement improvement projects using a systematic approach that employs the principles of improvement science.
- 5. Ability to recognize, acknowledge, and analyze medical errors and devise system-based strategies that would prevent similar errors in the future.

VI. Systems-Based Practice

Competency statement: 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 demonstrate the following at a developmentally appropriate level:

- 1. Understanding that health care of optimal value is safe, effective, patient-centered, culturally sensitive, timely, efficient, and equitable.
- 2. Understanding of the principles of systems science and the ways in which people, processes, technology, and policy combine to form systems.

- 3. Understanding of 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.
- 4. Understanding of 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., and the ability to coordinate patient care within these systems.
- 5. Understanding of different health professionals' roles and responsibilities within the health care delivery system and the ability to maximally utilize the capabilities of all health care team members to achieve optimal patient outcomes.
- 6. Understanding of the key elements of leadership, management, and organizational behavior and how these elements apply in teams, health care organizations, and society.
- 7. Understanding of how public health and health policy shape the nature of our health care system and how and when clinicians must interact with public health officials and policymakers.
- 8. Understanding of risk, complexity, resilience, and related concepts that influence the performance of humans and the systems in which they work.
- Ability to design, analyze, and evaluate health care microsystems and propose interventions that will improve quality, safety, and cost-effectiveness.

Advisory Colleges

Becoming a physician in the 21st century requires having dedication, a strong sense of purpose, a love of science, an interest in taking care of people, and high levels of motivation. In order to survive, and ideally thrive, in medical school, students must be able to adapt quickly to a learning environment with many teachers, numerous clinical training sites, and long hours, all of which sometimes prevent students from maintaining the proper balance necessary for their overall mental and physical health. In addition to the daily coping required to succeed in medical school, students are also faced with the enormous challenge of choosing a specialty from among the more than 110 available to them. With these continued stresses due to both immediate demands and the process of making a major life decision of specialty choice, it is easy for the medical school experience to become overwhelming. The Advisory Colleges at Vanderbilt are designed to support students along the way such that they adapt successfully to medical school and make decisions for themselves that will give them long-term happiness.

Upon matriculation into the medical school, students in the regular M.D. program are assigned to one of four Advisory Colleges, each of which is led by two faculty directors. The Advisory Colleges comprise students in all four years of medical school, as well as affiliated faculty advisers from a broad range of specialties. Additionally, senior students who have a strong interest in mentoring students in the preclinical years are invited to participate in the activities of the Advisory Colleges. Students in the Medical Scientist Training Program have a separate advisory system with six Advisory Colleges that provide support and address issues and concerns related to their training in the M.D./Ph.D. program.

Advisers

The Vanderbilt School of Medicine has one of the lowest attrition rates in the country. The faculty and administration take an active interest in assuring that each student achieves to maximum capability. Advisers, both student and faculty, and staff members of the office of the Dean are available to assist students toward successful development of their plans.

Office for Teaching and Learning in Medicine (OTLM)

The Office for Teaching and Learning in Medicine (OTLM) supports the educational program of the School of Medicine by providing educational resources and expertise, professional development opportunities and research agendas that inform our best educational practices. OTLM faculty and staff work with the teaching faculty, administration and students to improve the design of our instructional methods, the rigor of our assessment of competence and the quality of student outcomes. To learn more about the Office for Teaching and Learning in Medicine, please visit our website at *www. mc.vanderbilt.edu/medschool/otlm/index.php*

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. 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 two programs: the Program in Human Simulations and the Simulation Technologies Programs. 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 programs provide both unique and integrated approaches to training our medical students in a safe and effective educational environment.

Advanced Training

In addition to its primary responsibility of educating medical students, the School of Medicine has active programs for graduate students in the preclinical sciences, for postdoctoral interns and residents, and for postdoctoral research trainees.

Residency Training

Students preparing for the practice of medicine usually spend three or more years in house staff training. Such experiences at Vanderbilt are particularly varied and well supervised. Applicants for positions are carefully chosen because of the competition for positions. As a result, the house staff makes up a competent and stimulating group, with considerable responsibility in medical student teaching.

The faculty of the School of Medicine has professional responsibilities at Vanderbilt, Veterans, Saint Thomas, and Baptist hospitals. Patients in these hospitals are cared for by members of the medical staff, assisted by the intern and resident staff.

Vanderbilt University Hospital is a referral center and consequently has a patient population with complex medical and surgical problems. The Veterans Administration Hospital, adjacent to the Vanderbilt Medical Center, 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

Postdoctoral training programs have as their goal the training of physicians for practice and certification in a medical subspecialty. Fellows admitted to these programs must have completed an approved residency program. The fellow is expected to participate in departmental activities related to teaching, clinical services, and research.

Continuing Medical Education

Vanderbilt University School of Medicine and Vanderbilt University Medical Center recognize a major commitment to the continuing education of 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. CME activities at Vanderbilt are designed to help physicians provide the very best possible care to the patients they serve by providing the best combination of evidence-based information, information emerging from research at Vanderbilt and other academic centers, and the practical clinical wisdom of faculty. Accredited by the Accreditation Council for CME, the School of Medicine offers a broad spectrum of CME activities courses throughout the year to meet the learning needs of physicians in practice. Individual activities are planned and offered by departments and divisions of the school. Inquiries about accreditation should be directed to the Division of Continuing Medical Education or to departments and divisions about specific programming.

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 providing much-needed space 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. Light Hall is the physical manifestation of Vanderbilt University School of Medicine's ongoing commitment to excellence in all areas of medical education.

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), speechlanguage pathology (2007), and health professions education (2010).

Admission

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 preclinical course work.

Applicants must present evidence of having satisfactorily completed all of the minimum requirements listed below by the completion of the fall semester of the application year. A semester hour is the credit value of sixteen weeks of work consisting of one hour of lecture or recitation or at least two hours of laboratory.

Biology. Eight semester hours, including laboratory, in either general biology, zoology, or molecular biology.

Chemistry. A minimum of 16 semester hours, 8 in general inorganic chemistry, including laboratory, and 8 in organic chemistry.

While a year of inorganic chemistry is designated, Vanderbilt will accept the additional 8 hours with lab in an upper level chemistry course(s) other than organic, especially if the student has placed out of the entry level course.

English and Composition. Six semester hours.

Physics. Eight semester hours, including laboratory.

Advanced placement credits, CLEP credits, and pass/ fail credits are not acceptable in lieu of any requirements. Advanced courses in the same discipline may be substituted for the traditional requirements when the applicant has placed out of the entry level course.

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 associate dean for admissions, 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 on-line through AMCAS by going to *http://aamc.org.* AMCAS applications are screened by four faculty screening committees in order to select applicants for interview. Interviews are conducted at Vanderbilt between August and March. Interviewers consist of sixty faculty trained in interviewing techniques.

The Committee on Admissions evaluates the initial application received through the application service. Applicants receiving a favorable initial review are invited to be interviewed and to request letters of evaluation. Applications are received on-line by AMCAS any time after 1 June and before 15 November preceding an anticipated fall semester enrollment date. Vanderbilt participates in the Early Decision Program through the American Medical College Application Service.

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 and admissions committees.

Transfer Students

Acceptance for transfer is limited to the third year, filling places made by attrition only. Opportunities for transfer are rare because of the low attrition rate. Those students who have completed the second year in good standing at an LCMEaccredited U.S. or Canadian medical school are eligible to apply. The deadline for applying is March 1.

Dual Degree Programs

Medical Scientist Training Program

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 joint 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. The MSTP allows both joint and alternating enrollment in the School of Medicine and the Graduate School.

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

Following completion of three 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 rest of the rising third-year class. In special circumstances, MSTP students may begin their third-year studies between July and December coinciding with the beginning of a clinical clerkship. Students beginning the M3 year in early July can participate fully in the medical school elective program, including additional research, during the fourth year. Those beginning later must use elective time in the M4 year to complete the required M3 clinical clerkships.

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 follows.

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 studentdriven, literature-based course in critical thinking guided by three faculty preceptors. 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.

Clinical Preceptorship Program. The MSTP Clinical Preceptorship Program provides our students with exposure to clinical medicine during the period of research training. Each class is assigned two clinical mentors, an internist and a pediatrician, who work with the class for the duration of their graduate training. One half of the class works with the internist in the fall semester and the other works with the pediatrician, switching mentors for the spring semester.

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

Leadership Workshop. The MSTP Leadership Workshop provides 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 workshop is held biennially in even-numbered years.

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 in odd-numbered years.

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 six advising colleges that serve as the primary advising mechanism for students in the program. Each advising college is led by two faculty members and includes one or two members of each class across all years of the MSTP. We also include 3 to 4 M.D./Ph.D. resident advisers in each college.

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.

Financial Support

Funding for tuition and stipend is available for those who gain admission to the Medical Scientist Training Program. A training grant from the NIH supports about twenty-five percent of the expenses for the MSTP; the remainder comes from the Dean's Office, basic science and clinical departments, and philanthropy. The MSTP training grant is the largest training grant at Vanderbilt and provided more than \$1,015,300 to support students in academic year 2009/2010.

In addition to support from the NIH, there are a number of merit and institutional scholarships available to MSTP students. Every MSTP student is evaluated for award of these scholarships. They include the James T. and Olivia R. Allen Scholarship Fund, the Mary and William O. Inman Jr. Scholarship Fund, the Meade Haven Scholarship in Biomedical Sciences, the Canby Robinson Society Student Scholarship Benefactor Program, the Herbert M. Shayne Endowment, and the Thomas Huggins Winn Scholarship.

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 joint degree status before enrolling in either program. However, medical students may elect to apply for admission to the joint 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 joint degree.

Joint 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 Engineering

Students must apply separately to both the Vanderbilt University School of Medicine and the Department of Biomedical Engineering in the Vanderbilt University School of Engineering and be accepted by both programs to pursue the joint M.D./M.S. in biomedical engineering degree.

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

Joint degree students will complete both degrees in five years, saving one year in school, since ordinarily medical school takes four years and the M.S. in biomedical engineering two years.

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 joint M.D./M.S. in biomedical informatics degree.

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

Joint 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 joint 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 joint degree status before enrolling in either program. However, medical students may elect to apply for admission to the joint 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 joint degree.

The M.D./M.Div. joint 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.S. in Computer Science

Students must apply separately to the Vanderbilt University School of Medicine and the Computer Science program in the Vanderbilt School of Engineering and be accepted by both programs to pursue the joint M.D./M.S. in computer science degree. Students must meet requirements of each program for admission.

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

Joint degree students will complete both degrees in five years, saving one year in school, since medical school ordinarily takes four years and the computer science program two years.

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. joint 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 joint M.D./M.Ed. degree. Ideally, students will apply for joint degree status before enrolling in either program. However, medical students may elect to apply for admission to the joint 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.

Joint degree students will complete both degrees in five years, saving on 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 joint M.D./M.P.H. degree. Medical students may elect to apply for admission to the joint 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.

Joint 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 Managementand be accepted by both programs to pursue the joint M.D./MBA degree.

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

Joint 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, and this was the rationale behind the development of our Emphasis Program, with its nine areas of concentration. Five of those areas have potential links to MHS. They include: Community Health Initiatives, Medical Ethics, Humanity, and Policy, Law and Medicine, Health Services Research, and Global Health. The M.A. in MHS would allow selected students to extend their scholarly interests in those interdisciplinary areas, although prior work in one of those areas is not required. We feel that the MHS degree would provide our students with additional knowledge and research experience that would better 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 joint degree program. Requirements for the M.D. degree will be the same as those for non-joint-degree students. Students would be allowed to use two fourth-year elective credits to complete a thesis related to the M.A. degree. If students choose this route, then credit would be awarded jointly for those two months by both the School of Medicine and the Graduate School. In nearly all circumstances, students will be able to complete requirements for both degrees in a total of five years.

Other Single Degree Programs

Graduate Programs in Hearing and Speech Sciences

Doctor of Audiology

The 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, Veteran's 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 *www.vanderbiltbillwilkersoncenter*. *com* 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 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 (SLP) is administered through the Vanderbilt University School of Medicine and is CAA (Council on Academic Accreditation) accredited by the American Speech-Language-Hearing Association. Further information regarding graduate programs in hearing and speech sciences may be found online at www.vanderbiltbillwilkersoncenter.com. 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 (51-59 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.

Graduate Programs in Medical Physics

D.M.P. and M.S.M.P.

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 both the master of science degree and the professional doctoral degree in medical physics with a specialty in radiological medical physics. 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, the Department of Mathematics, and the School of Engineering (Department of Biomedical Engineering).

The master of science program (M.S.M.P.) offers tracks in both radiotherapy medical physics and diagnostic medical physics. Both tracks offer a thesis and a non-thesis option. The thesis option requires 26 didactic credit hours in addition to the thesis research project; the non-thesis option requires 32 didactic credit hours and 6 credit hours in clinical practicum. The master of science program is a 24-month program.

The professional doctorate in medical physics (D.M.P.) also 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 practicum. The didactic and research hours are completed in years one and two, and the clinical practicum credit 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.

All visiting 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 program is a threeyear 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 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.mc.vanderbilt. edu/mls* for additional information.

Master of Public Health

The Master of Public Health (M.P.H.) program is a two-year program offered by the School of Medicine for physicians and other doctoral-level health care professionals. The primary objective of the program is to provide training for clinical and patient-oriented researchers who will conduct non-experimental studies or clinical trials with large sample sizes. The M.P.H. includes didactic course work, public health practicum, and mentored research, the latter resulting in a thesis.

The M.P.H. program is open to physicians who have completed their residency training or other health care professionals at a comparable level. Normally, applicants will be clinical research fellows or faculty who seek training for a future career in epidemiologic, clinical, or health services research or health administration.

A five-year joint M.D./M.P.H. degree is offered for students interested in acquiring tools needed to conceptualize and conduct studies using the methods accepted by the premiere medical journals. Students in the joint degree program apply separately to the M.P.H. program and the M.D. program and must demonstrate a level of independence typically associated with fellowship or junior faculty status.

Please visit our website at www.mc.vanderbilt.edu/prevmed/ mph/index.html for additional information.

Master of Science in Clinical Investigation (M.S.C.I.)

The M.S.C.I. program trains investigators in the techniques and processes utilized 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
- medical students in the Medical Scholars program
- postdoctoral Ph.D.'s anticipating a career in patientoriented 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 General 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 31 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 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 this 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 thesis 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.mc.vanderbilt.* edu/msci/.

Master of Health Professions Education

The Master of Health Professions Education (M.H.P.E.) was approved in Spring 2010 with the first cohort beginning in Fall 2011 and is a unique collaboration among the School of Medicine, School of Nursing, and Peabody College of Education and Human Development. The program will follow an Executive MBA weekend format, in which each course meets three weekends per semester with approximately 16 contact hours per weekend. Courses earn between 2 and 4 credit hours, and students enroll in two courses, 6 credit hours, per semester. The School of Medicine will award the degree upon successful completion of the program requirements.

The M.H.P.E. program is designed to help health education professionals develop the necessary skills to lead our educational enterprise through a rapidly changing health sciences environment. The program is founded on the premise that a systematic, scholarly approach is the most effective way to address educational challenges. The mission of the M.H.P.E. is to train educational leaders and scholars who will contribute to the continuous advancement of health professions education and the health professions educator community, including those from medical, nursing, pharmacy, other health science, and graduate biomedical schools.

The M.H.P.E. degree program provides a 36-credit-hour curriculum with emphases on:

- Learning and instruction
- Curriculum development
- Continuous quality improvement
- Organizational leadership and innovation
- Research design and analysis

A capstone project will be required for graduation. This project will have the flexibility to be completed as a small group, in pairs or individually, depending on its design and the needs of our learners.

More information is available online at *https://medschool. vanderbilt.edu/mhpe/*.

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 register for coursework 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 Registrar's Office. Failure to apply through this office may result in denial of credit for any elective work.

Students wishing to visit at Vanderbilt School of Medicine should submit a Visiting Student Application through the AAMC Visiting Student Application Service (VSAS) at least eight weeks in advance of the requested rotation. For more information on VSAS, visit www.aamc.org/vsas or contact vsas@aamc.org. Applications are accepted beginning on April 1 and should include a picture, CV, USMLE Step 1 Score, transcript, and the appropriate fees for your VSAS application to be complete. All accepted students must confirm their participation by submitting a non-refundable \$75 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 Registrar's Office on the first day of their rotation which will include a Bloodborne Pathogen Training Session. Visiting students may not enroll for more than eight weeks of elective work at Vanderbilt without special approval.

Meharry Medical Students

The Vanderbilt School of Medicine has an alliance with Meharry Medical College which allows Meharry medical students to take an unlimited number of electives at Vanderbilt, space permitting, at no additional cost. Applications may be submitted through the VSAS application program at *www. aamc.org/vsas.*

Osteopathic Students

Students from osteopathic medical schools may apply to Vanderbilt University School of Medicine through the Visiting Student Program. Applications will be sent to the appropriate course director for review and departmental approval. Osteopathic students are also required to submit a non-refundable processing fee of \$75 upon approval and placement in an elective course. Applications are currently available through the School of Medicine website at *https://medschool.vanderbilt. edu/registrar/osteopathic-students.*

International Visiting Students

ol201 Catal

Vanderbilt School of Medicine does not accept students through the Visiting Student Program who are not enrolled in LCME approved medical schools or who are not enrolled in affiliated student exchange programs with the Vanderbilt University School of Medicine.

Academic Program and Policies

Requirements for M.D. Degree

Candidates for the doctor of medicine degree must be mature and of good moral character. They must have spent at least four years of study or its equivalent as matriculated medical students at an accredited medical school. Students accepted with advanced standing must complete at least the last two years in the Vanderbilt University School of Medicine. All students must have satisfactorily completed the medical curriculum, have passed all prescribed examinations, and have no outstanding unpaid balances with the University other than sanctioned educational loans. Students fulfilling these requirements will be recommended for the degree Doctor of Medicine.

The curriculum is divided into required courses taken by all students and elective courses taken at the choice of the individual student. Required courses constitute the nucleus of medical education at Vanderbilt; elective courses are an integral part of each student's educational experience in the School of Medicine, providing considerable flexibility for individual programming. Students develop an elective program to meet individual needs with the help of the faculty and the approval of the associate dean for medical student affairs or a designee.

All electives are courses for credit. Electives in the first and second years are graded as Pass or Fail; electives in the fourth year are graded on the same basis as required courses. The format for electives includes lecture or seminar series, specialty clinics, clinical clerkships, or research experiences at Vanderbilt or other approved institutions; and, in special circumstances, Vanderbilt undergraduate or graduate courses may be counted as electives.

Students cannot be paid for any work done for required or elective credit. Exceptions to this policy include the summer stipend received by all students for work on their Emphasis projects and students who receive stipends as part of scholarships, fellowships, or joint degree programs.

The curriculum is under constant review by both faculty and students, and is subject to timely change as recommended by the Undergraduate Medical Education Committee and approved by the Executive Faculty.

Academic Program

First Year

Required courses include Foundations of the Medical Profession; Patient, Profession and Society I; Molecular Foundations of Medicine; Structure, Function, and Development; Microbiology and Immunology; and the Emphasis Program. Students participate in a clinical preceptorship as part of the Patient, Profession and Society I course, so that clinical experience begins immediately. Students are encouraged to take at least one of their three required electives during the first year.

The Emphasis Program

The Emphasis Program requires that every student undertake a mentored scholarly project during the first two years of medical school. Projects are related to one of eight Emphasis areas: biomedical informatics; community health initiatives and health outreach; global health; health care and public health research and management; laboratory-based biomedical research; medical education; medical humanities, ethics, and policy; and patient-oriented research. Students choose their area and project during the first semester of first year, and embark on study design during second semester. During the summer between first and second years, all students devote eight weeks to their projects, supported by living stipends which are provided by the school. During the second year, students continue to work on their projects, analyze data, and prepare either poster or oral presentations for the annual Emphasis Forum, held each year in April. Students who are pursuing joint degrees through the Medical Scientist Training Program complete their laboratory rotations during time set aside for the Emphasis Program and also present their work at the Emphasis Forum.

Vanderbilt Fellowship in Interprofessional Learning

In 2010/2011, Vanderbilt University School of Medicine, in collaboration with Vanderbilt School of Nursing and several area professional schools, will offer a pilot program in interprofessional learning including a group of first-year students. The fellowship will use working-learning teams consisting of attending providers, medical post-graduate trainees, and students from medical, nursing, pharmacy, and social work schools to combine working and learning in order to provide the best patient care. Team members will be assigned clinic tasks based on learning needs and capabilities. All learners will share new knowledge through weekly case-based seminars and online networks. Every team member, including faculty providers, will maintain a learning portfolio and an individualized learning plan.

Since individual and population health relates to not only biological factors but also social, behavioral, economic, cultural, and educational elements, the fellowship will take a holistic, systems approach to health care, considering all health factors to determine the best approach to health maintenance and disease management. Teams will strive to determine the best combination of people, process, and technology to deliver the highest possible quality of care to each patient and will measure outcomes for common diseases like diabetes and high blood pressure. Teams will also be encouraged to develop new projects focused on community interventions, support groups, home visits, and coaching, and measure the impact these projects have on real outcomes.

Second Year

Required courses include Disease, Diagnosis, and Therapeutics; Brain and Behavior; Physical Diagnosis; Patient, Profession, and Society II; the Emphasis Program; and Introduction to Clinical Problem Solving. Students must also complete their electives requirement during the second year.

The School of Medicine offers a graduate certificate in global health to medical students who complete a formalized global health education curriculum during the first two years of their study. The curriculum includes a series of at least three electives offered by the Institute for Global Health (VIGH), additional course work in the student's own discipline deemed relevant and approved by the VIGH faculty, and a global health practicum which will include eight to twelve weeks of field work. This requirement may be satisfied through the Emphasis Program.

Third Year

Required clinical clerkships include Surgery (11 weeks), Medicine (11 weeks), Pediatrics (5.5 weeks), Obstetrics-Gynecology (5.5 weeks), Neurology (5.5 weeks), and Psychiatry (5.5 weeks). In addition, all students are required to participate in four intersessions, one of which proceeds each 11-week clerkship block. Half of each intersession is devoted to discussion of interdisciplinary topics, such as palliative care, geriatrics, nutrition, medical systems, and communication skills. During the last half of each intersession, students break into their clerkship groups to review the basic science concepts that are germane to that clerkship.

Ordinarily students will complete all clerkships before proceeding to their fourth year, but under special circumstances, students may defer one clerkship to the fourth year to pursue specific research or clinical interests. Such plans must be approved by the associate dean for medical student affairs. MSTP students who enter the third year after the first clerkship block may defer one block to the fourth year, with the permission of the MSTP program director and the associate dean for medical student affairs. These students should make every effort to complete all intersessions during the third year clerkships.

Core Clinical Curriculum

In 2009, the Vanderbilt Core Clinical Curriculum (VC3) was established as a learning plan that overlays students' clinical work. Master Clinical Teachers, a group of thirteen faculty mentors representing each of the core clinical rotations of the third and fourth years, have worked with the dean and course directors to establish a list of twenty-five presenting problems that compose the VC3. The twenty-five topics are not all a student must learn, but do represent problems that everyone should know. A set of learning objectives exists for each presenting problem. By relating clinical experience to learning objectives, students are better able to monitor progress toward becoming competent physicians. The support that students receive by way of tracking tools, reading resources, mentorship, and self management work in the VC3 program helps students to achieve mastery of clinical problems they encounter.

Fourth Year

The flexibility of the fourth-year curriculum gives the student maximum opportunity for individual development. The year is divided into ten four-week academic units running from July through April.

Eight units (32 weeks of instruction) must be completed. Primary Care Medicine, 520-5100, Emergency Medicine, 502-5950, and the Capstone course, 520-5090, are required. In addition, all students must complete one subinternship.

Four additional elective units must be chosen to total eight units for the completion of the degree program. Students may elect to have course work in all ten units.

Students must keep in mind the following elective limits and recommendations:

- Students may not enroll in the same elective twice.
- With rare exception, students should do no more than three clinical rotations in the same specialty.
- Students will need approval from the associate dean for medical student affairs to exceed this limit.
- Students are limited to two rotations away from Vanderbilt which require approval (7100—Special Study Clinical and 7150—Special Study Research). In addition, Primary Care may be taken away from Vanderbilt.
- Students are limited to two research rotations (6150— Special Study Research, VU or 7150—Special Study Research).
- Research rotations may last through two units. The approval process is required for each unit.
- MSTP students may receive one to two credits of research toward fourth-year requirements if they begin their third year at a time other than July.
- Other dual degree students may receive credit for two fourth year units, representing work completed in satisfaction of the second degree requirements

Requests for exceptions to these requirements must be made to the Registrar in writing for administrative approval.

Other Important Academic Policies

Honor Code

Vanderbilt students are bound by the Honor System inaugurated in 1875 when the University opened its doors. Fundamental responsibility for the preservation of the system inevitably falls on the individual student. It is assumed that students will demand of themselves and their fellow students complete respect for the Honor System. All work submitted as a part of course requirements is presumed to be the product of the student submitting it unless credit is given by the student in the manner prescribed by the course instructor. Cheating, plagiarizing, or otherwise falsifying results of study are specifically prohibited under the Honor System. The system applies not only to examinations but also to written work and computer programs submitted to instructors. The student, by registration, acknowledges the authority of the Student Honor Council of the School of Medicine. (See page 28 for the full Honor Code.)

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

The *Student Handbook*, available at the time of registration, contains the constitution and bylaws of the Honor System and the Honor Code, as well as an explanation of the functions of the Honor System.

United States Medical Licensing Examination (USMLE)

It is the policy of Vanderbilt University School of Medicine that all medical students will take Step 1 and Step 2 (both Clinical Knowledge and Clinical Skills) of the United States Medical Licensing Examination (USMLE) prior to graduation, although passage of Step 2 is not a degree requirement.

Attendance Policies for Pre-Clinical Courses

Unless stated otherwise, students are not required to attend general lectures in preclinical courses, although attendance in lectures is strongly encouraged. It is expected that students who attend lectures will arrive to class on time and demonstrate respect for their teachers, fellow students, and others while in class.

Student attendance at all sessions that include patients (actual or simulated) is mandatory. These sessions are not recorded due to concerns regarding patient privacy. Student attendance at all small group sessions is also mandatory. Small groups may include discussion or presentation sessions, laboratory groups, etc. as defined for individual courses. Student attendance may be required at other sessions as indicated by the course administration.

If possible, students should notify the course administration in advance if they will be unable to attend a mandatory class session. If the mandatory session is a small group, students should also notify their group mates. If students are not able to provide prior notice, they should contact the course administration as soon as possible to explain why they were not able to attend. Course directors may excuse students from mandatory sessions on the basis of health or family emergencies. Students may be excused for other reasons on a case-by-case basis.

As determined by the course administration, unexcused absences from mandatory sessions may negatively impact the student's professionalism evaluation or overall grade in the class. Course policies regarding unexcused absences must be made clear to students in writing.

Tutoring Policies for Pre-Clinical Courses

Formal tutoring will be offered ordinarily to students who are at risk for marginal (P*) or failing performance on exams or by poor performance on exams, quizzes, in small groups, in the lab, and/or through discussions with the faculty.

If a student has a failing or marginal performance in a course and wishes to obtain a tutor, he/she should set up a meeting to consult with the course faculty. Once the student's individual situation has been assessed by the faculty and the appropriate student assistance director, the level of tutoring support will be determined. On assignment of a tutor, the student will be responsible for contacting the assigned individual to set up tutoring appointments.

Student performance and the need for a tutor will be reassessed following every major examination in the course. If a student is already receiving tutoring and the faculty believe that the need still exists, the tutoring will continue. Tutoring assignments may be changed or adjusted based on the continuing needs of each student.

Excused Absences from Clinical Rotations.

Students may take up to three excused absence days from a clinical rotation with proper documentation. If more than three days away are required for any purpose, arrangements for make-up time must be made with the associate dean for medical student affairs and the course director.

Medical Student Duty Hours Policy

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 all third and fourth year students will be expected to take at least one day off in seven. 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

The School of Medicine does not regulate the outside work of its 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, the student may be required to discontinue it.

Leave of Absence

A leave of absence may be granted by the associate dean for medical student affairs for a period not to exceed one year for purposes of approved studies, recuperation from illness, or other special circumstances. Should it be necessary for a student to be absent for a period of more than one calendar year, the student must request approval from the associate dean for medical student affairs for each year thereafter. If a student requests a leave while on probation, approval by the Promotions Committee is required for both the leave and the re-entry.

Course Evaluation Policy

We at Vanderbilt believe that medical education is a lifelong process. Learning may occur in solitary, thoughtful reflection, in patient-doctor interactions, in interactions with peers and with those more experienced than oneself, and in a host of other settings.

In the classrooms, laboratories, and patient care areas of the School of Medicine and the Hospital, we believe the most effective learning is a team endeavor in which teachers are learners and vice versa. This mutuality is reflected, for example, in the obligation of faculty members to provide grades and other constructive commentary on student performance and how it can be enhanced. And it is reflected in the expectation that students will provide evaluative feedback and commentary on each course in order to improve the quality of instruction at Vanderbilt. Both processes of evaluation are essential to the Vanderbilt educational experience.

The student curriculum committee and the undergraduate medical education committee endorse the following guidelines in order to elicit the meaningful participation of every student in the evaluation process.

- 1. Every required course/clerkship will be evaluated by students.
- 2. The evaluation instrument (e.g., questionnaire) should be the product of student-faculty collaboration and of reasonable length.
- 3. Every student is expected to respond in a professional manner to each item which she/he feels qualified to answer.
- 4. Strict anonymity of responses must be assured.
- 5. Failure to respond will result in withholding the grade for the course. Further, repeated failure to respond in a timely and reasonable fashion will be brought to the attention of the appropriate Promotions Committee.

Grading and Promotion Policies for the School of Medicine

Doctor of Medicine Degree

The Doctor of Medicine program has established a series of learning objectives for its educational program that can be clustered into the following categories: (1) knowledge, (2) patient care, (3) interpersonal and communication skills, (4) professionalism, (5) practice-based learning and improvement, (6) systems-based practice, (7) and professional values. The achievement of these educational objectives defines the successful development of the physician-in-training and occurs during the course of a student's progress in medical school.

All Years

Students will be evaluated on acquisition of knowledge and skills as well as professional development and values. Appropriate professional values are expected of medical students throughout all stages of professional training. In the category of professional values, students will be evaluated in each course as meeting standards, cause for some concern, or cause for major concern. Any student causing any level of concern should be promptly identified and brought to the attention of the associate dean for medical student affairs so that counseling can be initiated. A student for whom major concern persists will be given a failing grade (F) for the course without regard to performance in other categories. Such students will be automatically reviewed by the Promotions Committee and will be subject to possible dismissal from school.

A grade of Incomplete is to be used only to reflect that work has not been completed and should not be used when work has been completed but at an unsatisfactory level and requiring remediation.

Students will not be permitted to be supervised or evaluated by a parent or relative in any academic setting.

Years One and Two

Students in the first year will be awarded a final grade in a course of Pass (P), Fail (F), or the temporary grade of Pass* (P*-marginal performance). Students in the second year will be awarded a final grade in a course of Honors (H), Pass (P), Fail (F), or the temporary grade of Pass* (P* - marginal performance.) An Honors grade reflects superior or outstanding performance in all aspects of a course, including professional values. Ordinarily, honors grades will be given to no more than 25 percent of a class.

P* is defined as a grade that is unsatisfactory, but still within the passing range. It is a temporary grade that will be changed to either a Pass or a Fail by the course faculty with the approval of the Promotion Committee at the final meeting of the year. It is recognized that in extreme cases, students may be failed or awarded a P* for issues related to professionalism that are independent of other aspects of academic performance. At the discretion of the faculty by request through the Promotion Committee, a student who is awarded a P* may be required to undergo remediation in some or all aspects of the course.

Years Three and Four

Faculty and House Staff Assessments of Students. Faculty and house staff providing primary evaluations of students will not recommend letter grades. The evaluation provided by faculty and house staff will provide (1) assessments of the frequency with which each student demonstrates behavior in the various categories subject to evaluation, (2) narrative comments, and (3) an evaluation of suitability for appointment to residency on the service.

Determining Clerkship Grades. Students will receive a grade for each category of learning objectives and a final course grade. For the categories other than Values, discussed above, and for the final grade, each student will be graded Honors (H), High Pass (HP), Pass (P), Pass* (P*), or Fail (F).

Determining Grades for Categories:

- An H grade will be given to students demonstrating superior achievement in a category.
- A HP grade will be given to students demonstrating better than average, but not superior achievement in a category.
- A P grade will be given to students demonstrating completely satisfactory performance in a category.
- A grade of P* will be given to students whose achievement in a category is marginal.
- An F grade will be given for unsatisfactory achievement in a category. A student receiving an F in any category must receive an F for the clerkship.

Determining Clerkship Grades:

- An H grade will be given to students for superior or outstanding achievement in all of the categories. Ordinarily, honors grades will be given to no more than 25% of a class.
- A HP grade will be given to students with superior achievement in several, but not all categories.
- A P grade will be given to students who demonstrate satisfactory achievement in all categories.
- A grade of P* will be given to students whose performance is marginal because of important deficiencies in some aspects of course work. The P* grade may be applicable for academic credit in an individual course only after approval by the student's Promotions Committee and endorsement by the Executive Faculty as reviewed in light of the student's complete record for the year. The Promotions Committee may require remedial work before such approval is recommended. Upon receiving such approval, the P* grade will be recorded on the official transcript as a P. In the absence of such approval, the P* grade will be recorded on the official transcript as an F.
- An F grade is given for unsatisfactory work resulting in failure. A student receiving an F in any individual category may receive an F for the clerkship. Similarly, a student with concerns in the area of Professional Values may receive an F grade based on the criteria defined above.

Student Grievances 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 six months after the event. 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, he or she should bring the problem, within two weeks of talking with the course director, to the attention of the associate dean for medical student affairs, who will seek to resolve the problem. If resolution is still not achieved, the associate dean will make a recommendation to the Dean, which will be accompanied by commentary on the recommendation by the relevant department chair. The Dean will make the final decision.

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Promotion

Successful completion of the courses of the medical curriculum and scholastic standing are determined by the character of the student's daily work; the results of examinations, which may be written, oral, or practical; and observation of the student in action. The medical school curriculum builds progressively on the course work of each previous academic year. The courses of each subsequent year require increasing levels of coordination and integration of the material previously presented. Thorough knowledge and understanding of each subject and an appropriate level of skills are therefore required for satisfactory progress to be maintained in the medical curriculum.

Promotion committees of the faculty, in consultation with representatives of the departments responsible for instruction, are charged with making recommendations to the Dean, and the Executive Faculty regarding progress and promotions of students in each class. The Executive Faculty of the School of Medicine has final responsibility for the determination of medical student progress in the school. Decisions on the progress of students during the first two years are ordinarily made at the end of each academic year. In view of the integrated nature of the curriculum in the final two years, no specific decisions on promotion from the third to the fourth year are made. Decisions on the progress of students during these final two years, however, may be made at any time as academic performance may dictate. Ordinarily, decisions for graduation will be made shortly before Commencement in the final year.

The committees recommend for promotion those students who have demonstrated the knowledge, understanding, skills, and personal behavior consistent with faculty expectations at their particular stage of professional development. The school's academic program is predicated upon providing students an academic environment conducive to successful achievement. Occasionally, however, the outcome is unsuccessful.

If the academic performance of a student is deemed to be unsatisfactory, or if there is a serious concern regarding the professional behavior of a student, that individual may be dismissed from the School of Medicine or placed on probation. The promotions committee for each class is responsible for making recommendations to the Dean regarding student dismissal or probation. Ordinarily, these decisions are made at the final meeting of the academic year.

Probation

Probation serves three separate functions. First, it serves as official documentation that the student is deficient in areas related to academic performance and/or professionalism. Second, it provides the pathway that the student must follow in order to regain good standing in the School of Medicine. This may include remediation, maintaining appropriate performance standards, and/or adhering to professional expectations. Third, it describes the consequences that will result if a student does not meet stated expectations during the period of probation. If a student is placed on probation, it is noted on his/her official School of Medicine transcript and included in the final Medical Student Performance Evaluation. Unless stated otherwise, the period of probation is one year. Promotions Committees will recommend removal of probationary status based on the student's satisfactory performance in succeeding units of study.

It is recognized that each student's situation represents an individual set of circumstances. Consequently, while the Promotions Committees will apply similar standards and principles throughout their deliberations, the decisions regarding dismissal or probation will be decided on a case-by-case basis. Some academic deficiencies will result in mandatory probation. In this regard, any student who receives a failing grade in a School of Medicine course or is requested to repeat all or part of an academic year will automatically be placed on probation.

Ordinarily, Promotions Committees will recommend dismissal of a student who receives a failing or marginal (P*) grade in a School of Medicine course or displays a significant breech in professionalism while s/he is on probation. In this event, the decision regarding dismissal will be rendered as soon as possible once the student's Promotions Committee is made aware of the circumstances. Students who are facing dismissal from the School may be given the option of withdrawing.

Appeals

A student may choose to appeal the dismissal recommendation of the Promotions Committee. He/she must submit a letter to the Dean who will appoint a sub-committee from the Executive Faculty to consider the case. If the sub-committee chooses to support the Promotions Committee recommendation and dismiss the student, the student will no longer have the opportunity to withdraw. If the dismissal is reversed, the student will be reinstated in the school with conditions set by the sub-committee. The decision of the sub-committee will be final.

Grading and Promotions—Other Degrees

All medical school degree programs, including Medical Physics, Hearing and Speech, Clinical Investigation, Laboratory Investigation, and Public Health will use the grading scale below:

A+ = 4.0
۹ = 4.0
A-=3.7
B+=3.3
B = 3.0
B- = 2.7
C+=2.3
C = 2.0
C-=1.7
D+=1.3
D=1.0
F=0

Good academic standing is defined as a semester and cumulative grade point average of 3.0 or higher.

Additional specific policies for each program are found below.

Master of Public Health

With the exception of the master's research course, all courses will be graded with letter grades (A, B, C, F). The master's research course and the elective courses are pass/fail and are not considered in calculation of GPA. Only courses with a grade of B or better will count toward the program requirements.

Master of Laboratory Investigation

A student will not be granted graduate credit for any course in which a grade of less than C is received. The letter I may be used at the discretion of the instructor in those cases in which the student is not able to complete work during the normal time allotted for the course. The notation W is entered onto the transcript when a student withdraws from a course. A grade point average of 3.0 is required for graduation.

Master of Education of the Deaf Master of Science (Speech-Language Pathology) Doctor of Audiology

Degree candidates must pass all courses, with a 3.0 cumulative grade point average (A = 4 points, B = 3, C = 2, D = 1, F = 0). Exempted courses, incompletes, passes, and courses taken outside Vanderbilt University are not included in computations of grade point averages. Students may not enroll in courses for which they do not have the prerequisite courses.

Master of Science in Clinical Investigation

Only grades of B or better will count toward the program requirements. A grade of "Pass" is also acceptable.

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. on Catalo

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-eighth of the students of the fourth-year class are eligible for membership, and only one-half of the number of eligible students may be elected to membership during the last half of their third year. 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.

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 Executive Faculty, 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

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.

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.

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.

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.

JANET M. GLASGOW MEMORIAL ACHIEVEMENT CITATION. This citation is presented in recognition of the accomplishments 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.

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 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. DAVID R. FREEDY MEMORIAL AWARD. This award is established to honor the memory of David Richard Freedy, a member of the Class of 1993. It is given to the student who has demonstrated leadership, courage and perseverance in the face of adversity.

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. The award is in memory of Dr. Amos Christie, who was Professor and Chairman of the Department of Pediatrics from 1943 to 1968.

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.

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.

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.

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.

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.

SURGICAL CLERKSHIP AWARD. This award is presented by the Section of Surgical Sciences to a student who has shown superior performance in the third-year surgical clerkship and who plans to enter graduate education in surgery.

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.

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.

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

THE AWARD FOR EXCELLENCE IN INFECTIOUS DISEASES. This award is presented annually 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. 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.

THE TOM NESBITT AWARD. This award is presented by the Nashville Academy of Medicine in recognition of the service and contribution of Tom Nesbitt, MD, as a member of the Academy and 133rd president of the American Medical Association. It also honors the quality of medical leadership in Nashville, as evidenced through the eight AMA presidents elected from the Nashville Academy of Medicine, the most of any county in the country. For achievement in educational, socio-economic, and legislative affairs, the Tom Nesbitt award is presented to the graduating medical student who has understanding and appreciation for such endeavors, and who demonstrates exemplary character and leadership.

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.

PAULA C. HOOS AWARD. The Class of 2009 presents this award in recognition of teaching excellence in the anatomy laboratory and to express our sincere appreciation for the assistance of members of the graduating class.

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. Jizu Catalo

THE HARRISON SHULL SR. GASTROENTEROLOGY AWARD. This award is to recognize a medical student who has demonstrated outstanding clinical performance during the student rotation in gastroenterology or hepatology.

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

EXCELLENCE IN EMERGENCY MEDICINE. This award for Excellence in Emergency Medicine is given on behalf of the Society for Academic Emergency Medicine. This award recognizes a medical student for outstanding clinical performance in the Emergency Department at Vanderbilt University Medical Center.

TENNESSEE ACADEMY OF FAMILY PHYSICIANS AWARD. This award is presented in recognition of dedication to the high ideals of Family Medicine.

OSCAR B. CROFFORD AWARD FOR DIABETES/ ENDOCRINE RE-SEARCH. 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.

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.

Financial Information

Financial Information for Medical Students

uition for the academic year 2010/2011 is \$39,900. The annual expense of a first-year student in the School of Medicine is estimated to be \$62,820.

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

2010/2011

Application fee (to accompany secondary application)	\$ 50
Student activities and recreation fee	454
Student health insurance	2,142
Professional liability insurance	410
Student long-term disability insurance	52
Student health service fee	65
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 18 August. Second-semester tuition, fees, and other university charges are due and payable by 6 January. Additional information can be found at *www.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 semester.

Withdrawal prior to the end of	Reduction
1st full week	100%
2nd full week	95%
3rd full week	90%
4th full week	80%
5th full week	75%
6th full week	70%
7th full week	60%
8th full week	55%
9th full week	50%
10th full week	40%

No refund after the 10th full week.

Late Payment of Fees

Charges not paid by 18 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 18 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.

Books and Equipment

Third- and fourth-year students are required to have a pager for an annual cost of approximately \$180.

All students must have clean white laboratory coats. In their second year, students must acquire hemocytometers and ophthalmoscopes. The average cost for these instruments is approximately \$400.

The average cost of books is approximately \$500 per year. The bookstore accepts cash or major credit cards.

First-year students will be required to have laptop computers for a one-time estimated cost of \$1,500.

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 Vanderbiltaffiliated 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.gallagherkoster.com. Additional information is also available at www.vanderbilt.edu/stuaccts/g_health.html.

Student Health Service Fee

The required student health service fee covers required immunizations and health screening tests.

Transcript Fee

All new students entering Vanderbilt for the first time are charged a one-time transcript fee for official university transcripts.

Merit/Non-Need-Based Scholarships

Every medical student will receive a minimum of \$2,000 in scholarship assistance, regardless of demonstrated need.

Each year, a number of merit scholarships are awarded to incoming students. The school is dedicated to creating a rich and excellent academic environment for each student. This environment is enhanced by the inclusion of students who are talented and represent a broad spectrum of society—social, economic, and cultural. Merit scholarships ordinarily continue through four years of study, as long as students maintain satisfactory academic performance. There is no application process for merit scholarships. Selected students will generally be notified by letter from the Dean.

THE THOMAS M. BLAKE SCHOLARSHIP. This endowed scholarship was established through a bequest provision by the late Thomas M. Blake, a 1944 graduate of the School of Medicine. The income is used to assist worthy students in the School of Medicine on the basis of merit. Partial-tuition scholarships are awarded periodically.

THE CANBY ROBINSON SCHOLARSHIPS. Canby Robinson Scholarships provide full tuition and, with satisfactory progress at Vanderbilt, continue for four years. The scholarships are awarded on the basis of demonstrated leadership and scholarship activities. Scholarship recipients are recommended by the Dean and the associate dean of admissions and chosen by a committee from the Canby Robinson Society. These scholarships were established in 1986 by the Canby Robinson Society.

THE JOHN E. CHAPMAN. M.D., ENDOWED SCHOLARSHIP FUND. This endowed fund was established in 2001 by friends, colleagues, and medical alumni to honor Dean Chapman, the seventh dean of the School of Medicine, upon his retirement after twenty-five years of service. Full- and partial-tuition scholarships are awarded on the basis of merit and need.

THE JOE C. DAVIS SCHOLARSHIP. The Davis Scholarship is given periodically to an incoming medical student who has demonstrated qualities of scholarship and leadership, as well as financial need. To be eligible, the candidate must come from a state specified as a Southeastern state east of the Mississippi. Full- and partial-tuition scholarships are awarded periodically for four years of medical study, contingent upon satisfactory performance.

THE DEAN'S SCHOLARSHIPS. Full- and partial-tuition scholarships are awarded annually for four years of study, contingent upon satisfactory academic performance. The Vanderbilt University School of Medicine is committed to diversity in its student body.

THE DORIS M. AND FRED W. LOVE SCHOLARSHIP. The Love Scholarship was established by Dr. Fred W. Love (M.D. 1945) and Mrs. Love. This tuition scholarship is given periodically and continues contingent upon satisfactory progress until the recipient graduates.

THE KONRAD LUX SCHOLARSHIP. This endowed scholarship was established by the will of Konrad Lux (M.D. 1925) to benefit students in the oral surgery program.

THE BESS AND TOWNSEND MCVEIGH SCHOLARSHIP FUND This endowed scholarship was established in memory of her parents by Grace McVeigh (B.A. 1925) to provide full and partial tuition scholarships for the benefit of needy and worthy students in the School of Medicine.

THE BARBARA D. MURNAN MEMORIAL SCHOLARSHIP. This endowed scholarship fund was established through a bequest provision by the late Barbara Murnan (B.A. 1934). The income provides merit-based awards to medical students. Partial-tuition scholarships are awarded periodically.

THE COLEMAN D. OLDHAM HONOR SCHOLARSHIP. This endowed scholarship was established through testamentary trust agreements by the late Coleman D. Oldham (B.A. 1924) and his sister Emma. Mr. Oldham lived in Richmond, Kentucky. The Oldhams stipulated that the scholarship be used to benefit worthy male students from Madison County, Kentucky, or if not available, worthy male students from Kentucky at large.

THE ELIZABETH CRAIG PROCTOR SCHOLARSHIP. This endowed scholarship was established through the generosity of Elizabeth Proctor and provides full tuition to a worthy medical student chosen by the Dean of the School of Medicine. The first Proctor Scholarship was awarded to a student from the incoming class of 2004.

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.

In addition to the merit scholarships just described, scholarships and loans are available through Vanderbilt, based on demonstrated financial need and continued satisfactory academic progress. 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 Subsidized and Unsubsidized Stafford Loan programs and the Federal Direct Graduate PLUS loans. Private loans are also available to international students.

Additional information and applications for financial aid are online at *https://medschool.vanderbilt.edu/financialservices/*. Applicants desiring more specific information about financial aid resources should contact the medical school Office of Student Financial Services.

The following are some of the Vanderbilt University School of Medicine institutional scholarships and loans available to assist students with demonstrated financial need.

Scholarships

THE JAMES T. AND OLIVIA R. ALLEN SCHOLARSHIP FUND. Established in 1993 by Dr. and Mrs. James T. Allen (M.D. 1942) to provide scholarship assistance to needy and worthy students enrolled in the Vanderbilt University School of Medicine. Preference should be given to students who are members of the First Baptist Churches of Murfreesboro, Dickson, Waverly, Tennessee, in that order, but if no qualified students apply in any one year, that preference then be given to applicants who are Tennessee residents, and if no such qualified student applies in that year, give it to any qualified applicant.

THE ALPHA KAPPA KAPPA SCHOLARSHIP FUND. These funds are made available to students through contributions from alumni of the Alpha Kappa Kappa medical fraternity.

THE LUCILE R. ANDERSON SCHOLARSHIP FUND. This scholarship was established by Lucile R. Anderson (M.D. 1933).

THE SUE AND NELSON ANDREWS SCHOLARSHIP FUND. This endowed scholarship fund was established in 2001 through the generosity of Board of Trust member Nelson Andrews (B.A. 1950) and his wife, Sue Adams (B.A. 1951), to help deserving and needy students attend the School of Medicine.

THE BAKER-LEONARD SCHOLARSHIP. This scholarship was established by Quentin B. Leonard 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.

THE EUGENE AND MARGE BESPALOW SCHOLARSHIP FUND. This endowed scholarship fund for deserving medical students was established by Dr. Bruce Dan (M.D. 1974) in honor of his grandparents.

THE DR. DANIEL B. BLAKEMORE SCHOLARSHIP FUND. This endowed scholarship was established by the will of Mrs. Nell J. Blakemore in memory of her husband for the benefit of worthy medical students who are in need of financial assistance.

THE BURRUS SCHOLARSHIP FUND. This endowed scholarship was established by members of the Burrus family to help meet the cost of tuition for medical students.

THE GREER BUSBEE III SCHOLARSHIP FUND. This endowed scholarship fund was established in 1999 by Dr. and Mrs. Brandon Busbee in remembrance of Greer Albert Busbee III for the benefit of medical students with financial need.

THE THOMAS CULLOM BUTLER AND PAULINE CAMPBELL BUTLER SCHOLARSHIP. This endowed scholarship was established by Thomas Cullom Butler (M.D. 1934) for worthy and needy medical students.

THE WILLIAM ROBERT CATE, M.D., SCHOLARSHIP. This endowed scholarship was established in 1996 by numerous donors to provide unrestricted scholarship support for the School of Medicine.

THE JOHN E. CHAPMAN, M.D., AND JUDY CHAPMAN SCHOLARSHIP. This endowed scholarship fund was established through a bequest provision by the late Grace McVeigh to honor her friends Dean Chapman and his wife Judy for their many years of service at Vanderbilt University. The income is used to support needy and worthy students in the School of Medicine.

THE ALICE DREW CHENOWETH SCHOLARSHIP. This scholarship honors the career of Dr. Alice Drew Chenoweth (M.D. 1932), who had a distinguished career as a pediatrician in the area of public health.

THE CLASS OF 1943 MARCH AND DECEMBER SCHOLARSHIP FUNDS. These endowed scholarships were established by members of these medical school classes.

THE CLASS OF 1946 MEDICAL SCHOLARSHIP. This scholarship was established by members of this medical school class.

THE CLASS OF 1964 MEDICAL SCHOLARSHIP FUND. This scholarship was established by members of this medical school class.

THE CLASS OF 1978 SCHOLARSHIP. This scholarship was established in 2007 to provide scholarship support to students enrolled in the School of Medicine.

THE DR. ROBERT D. COLLINS SCHOLARSHIP FUND. This endowed scholarship was established by alumni in honor of Dr. Robert D. Collins (M.D. 1951) a distinguished and admired longtime professor of pathology.

THE COMMONWEALTH SCHOLARSHIP. This scholarship aid is made possible by the generosity of the Commonwealth Fund of New York City, a private foundation which has been supporting needy and deserving students in the School of Medicine for many years.

THE MARVIN B. AND MILDRED G. CORLETTE SCHOLARSHIP. This scholarship was established in December 2003. This endowment will support students in the medical school.

THE LOUISE WILLIAMS COUCH SCHOLARSHIP. This endowed scholarship was established in 1998 in a letter from Dr. Orrie A. Couch requesting that a fund he established in 1962 at the George Peabody College for Teachers (now Peabody College at Vanderbilt) be transferred to the medical school for the purpose of providing scholarship support for medical students.

THE DEBORAH AND C. A. CRAIG II MEDICAL SCHOLARSHIP FUND. This fund was established in 1992 by Mr. and Mrs. C. A. Craig II. It provides support to talented and deserving students engaged in the study of medicine. Preference is awarded to former Eagle Scouts.

THE JACK DAVIES SCHOLARSHIP FUND. This fund was endowed primarily through gifts from the Classes of 1981, 1982, 1983, 1984, and 1994 in honor of the distinguished and beloved longtime professor of anatomy. This fund is designed to provide medical student financial assistance.

THE J. T. AND MARY P. DAVIS SCHOLARSHIP FUND. This endowed scholarship was established by J. T. Davis (M.D. 1931).

THE HERBERT ESKIND MEMORIAL FUND. This scholarship honoring the memory of Mr. Herbert Eskind was established by members of his family.

THE ROBERT SADLER–WILLIAM EWERS SCHOLARSHIP FUND. This endowed scholarship was established in honor of Robert Sadler (M.D. 1947) and William Ewers (M.D. 1947).

THE J. F. FOX STUDENT SCHOLARSHIP IN MEDICINE. This fund was established in memory of Dr. J. F. Fox (M.D. 1898) and provides for annual assistance to students in the School of Medicine based on scholarship, promise, and financial need.

THE THOMAS F. FRIST SR., M.D., SCHOLARSHIP. Established in 2006 by H. Lee Barfield (B.A. 1968, J.D. 1974) and Mary Frist Barfield (B.S. 1968) to honor her father and to provide financial assistance to medical students at the Vanderbilt University School of Medicine. Dr. Frist was a pioneer in the world of for-profit health care and founded Hospital Corporation of America in 1968.

THE D. G. GILL SCHOLARSHIP FUND. This fund was established in 1982 by the family of the late Dr. Daniel Gordon Gill. First preference goes to those students with financial need who have expressed an interest in the field of public health.

THE DRS. FRANK LUTON AND CLIFTON GREER SCHOLARSHIP FUND. This fund was founded in 1995 through a gift from the estate of Dr. Clifton Greer (M.D. 1951) in honor of the late Dr. Luton (M.D. 1927). It provides tuition support for medical students with demonstrated financial need, with preference given to those from the southeastern United States.

THE DR. HARRY GUFFEE SCHOLARSHIP FUND. This endowed scholarship was established in honor of Dr. Harry Guffee (M.D. 1939). Residents of Williamson County, Tennessee, are given first preference, and residents of the counties adjoining Williamson County are given second preference.

THE GLENN AND VIRGINIA HAMMONDS SCHOLARSHIP. This endowed scholarship was established by the late Dr. R. Glenn Hammonds (M.D. 1944). The income is used to provide financial assistance to worthy and needy medical students.

THE FRANK M. HANDLEY SCHOLARSHIP. This endowed scholarship was provided from the estate of Frank M. Handley (J.D. 1928).

EMILY AND H. CAMPBELL HAYNIE SCHOLARSHIP. In October 2001, the Emily and H. Campbell Haynie Scholarship was established in the medical school endowment fund to benefit medical students.

THE JAMES HOLLORAN SCHOLARSHIP. This endowed scholarship was established by the class of 1980 in memory of their classmate, "Ed" Holloran.

THE HARRY R. JACOBSON, M.D., AND JAN JACOBSON SCHOLAR-SHIP. This endowed scholarship fund was created through a bequest by the late Grace McVeigh to honor Vice Chancellor Jacobson and his wife Jan for their service to Vanderbilt University. The income is used to provide support to needy and worthy students in the School of Medicine.

THE HOLLIS E. AND FRANCES SETTLE JOHNSON SCHOLARSHIP FUND. This endowed scholarship was established by Hollis E. Johnson (M.D. 1921).

THE ERNEST G. AND MIRIAM H. KELLY SCHOLARSHIP. This endowed scholarship was established through the trust of Dr. Ernest G. Kelly (B.A. 1922, M.D. 1926) to provide scholarship support within the School of Medicine.

THE IKE J. KUHN FUND. This scholarship fund is provided by a bequest from the will of Mr. Ike J. Kuhn and is awarded in the School of Medicine to a worthy man or woman born and raised in any of the states commonly known as the "southern states."

THE ANN R. LIGHT SCHOLARSHIP FUND. This endowed scholarship was established by Ann R. Light for needy medical students.

THE CHARLES T. LOWE SCHOLARSHIP. This endowed scholarship was established in 2002 through a bequest from Charles T. Lowe (B.A. 1932, M.D. 1936). This scholarship is restricted to residents of Dallas County, Arkansas, Wilson County, Tennessee, or surrounding counties.

THE THOMAS L. MADDIN, M.D., FUND. This fund is provided by a bequest from the will of Mrs. Sallie A. C. Watkins in memory of Dr. Thomas L. Maddin.

THE JACK MARTIN SCHOLARSHIP FUND. This endowed scholarship was established in honor of Jack Martin (M.D. 1953).

THE MARGARET LOONEY MCALLEN SCHOLARSHIP. Established in 2005 by C. Ashley McAllen (M.D. 1987) to provide scholarship support to deserving students enrolled in the Vanderbilt University School of Medicine based on financial need.

THE ROBERT L. AND BILLYE MCCRACKEN SCHOLARSHIP. This endowed scholarship fund was established through the generosity of the late Dr. and Mrs. Robert McCracken. Dr. McCracken (M.D. 1939) was a Nashville thoracic surgeon. The income is used to provide financial assistance to needy and worthy students enrolled in the School of Medicine.

THE PATRICIA AND EDWARD J. MCGAVOCK SCHOLARSHIP FUND. This endowed scholarship fund was established in 1998 through a bequest provision by the late Patricia McGavock of Old Hickory, Tennessee, to benefit students enrolled in the Vanderbilt University School of Medicine.

THE CHARLES AND EDITH MCGILL SCHOLARSHIP FUND. This endowed scholarship was established in 2000 through the proceeds of a life income trust set up by the late Charles M. McGill (M.D. 1935) and his wife, Edith, for the benefit of students enrolled in the Vanderbilt University School of Medicine.

THE BARTON MCSWAIN ENDOWED SCHOLARSHIP This endowed scholarship was established in 1994 with proceeds raised by the Vanderbilt School of Medicine Class of 1958 to honor the late Nashville pathologist H. Barton McSwain (B.A. 1927 M.D. 1930). The income is to be used to benefit students enrolled in the Vanderbilt University School of Medicine.

MEDICAL STUDENT SCHOLARSHIPS GIFT FUND. Funds are available to needy students through gifts donated by alumni and friends of Vanderbilt School of Medicine. THE H. HOUSTON MERRITT SCHOLARSHIP. This endowed scholarship was established by H. Houston Merritt (M.D. 1922).

THE JAMES PRESTON MILLER TRUST. This trust, left by the will of James P. Miller in memory of his father, James Preston Miller, provides funds to assist in the medical education of deserving young men and women at Vanderbilt University. Residents of Overton County, Tennessee, are to be given first preference, and other residents of Tennessee are to be given second preference.

THE ANN MINOT ENDOWED SCHOLARSHIP. This endowed scholarship was established in 1994 to provide need-based scholarships to students in the School of Medicine.

THE C. LEON PARTAIN, M.D., AND JUDITH S. PARTAIN SCHOLARSHIP FUND. This endowed scholarship was established in 1998 through a bequest of the late Grace McVeigh (B.A. 1925) for the benefit of needy and worthy students at Vanderbilt University School of Medicine. The scholarship honors Dr. and Mrs. Partain for their service to Vanderbilt University Medical Center during Dr. Partain's tenure as chairman of the Department of Radiology and Radiological Sciences, 1992–2000.

THE WILLIAM B. PIDWELL, M.D., AND SUSAN A. PIDWELL SCHOLAR-SHIP. Established in 1999 to provide support to talented and deserving students with demonstrated financial need engaged in the study of medicine. Preference is given to those students majoring in family medicine.

THE THOMAS W. RHODES STUDENT SCHOLARSHIP FUND. Funds provided by the will of Georgine C. Rhodes were left to Vanderbilt University for the purpose of establishing a scholarship fund in the School of Medicine.

THE RILEY SCHOLARSHIP. This endowed scholarship was established by members of the Riley family: Harris D. Riley, Jr., M.D. (B.A. 1945 M.D. 1948); Frank Riley (B.A. 1949); Richard F. Riley, M.D. (B.A. 1946 M.D. 1948); and William G. Riley, M.D. (B.A. 1943 M.D. 1945).

THE CANBY ROBINSON SOCIETY STUDENT SCHOLARSHIP BENE-FACTOR PROGRAM. Scholarships are made available to students from members who donate to this program.

THE ROSCOE R. ROBINSON, M.D., AND ANN ROBINSON SCHOLAR-SHIP FUND. This endowed scholarship was established in 1999 through a bequest by the late Grace McVeigh (B.A. 1925) for the benefit of needy and worthy students in the Vanderbilt University School of Medicine. The scholarship honors Dr. and Mrs. Robinson for their service to Vanderbilt Medical Center during Dr. Robinson's tenure as Vice Chancellor for Medical Affairs, 1981–1997.

THE DAVID E. AND BARBARA L. ROGERS ENDOWED SCHOLARSHIP. This endowed scholarship was established in 2003 by Barbara L. Rogers, the widow of Dr. David E. Rogers, to support students in the School of Medicine.

THE HELEN AND LOUIS ROSENFELD ENDOWED SCHOLARSHIP FUND. This endowed scholarship was established by Helen Rosenfeld, a Vanderbilt University alumna, and Louis Rosenfeld (M.D.1936).

THE GEORGE E. ROULHAC MEMORIAL SCHOLARSHIP FUND. This fund was established in 1994 through a gift from the estate of Dr. Roulhac (M.D. 1939). It provides tuition support for medical education.

THE WILLETT H. "BUDDY" RUSH SCHOLARSHIP. Established in memory of Dr. Rush (M.D. 1941), this scholarship honors the dedication he showed to the practice of medicine and the Frankfort, Kentucky, community. Awards are given in order of preference to students from Frankfort, Kentucky, the bluegrass region of Kentucky, and then the state of Kentucky.

THE RICHARD M. SCOTT FINANCIAL AID PROGRAM. This endowed scholarship was established by the medical class of 1988 to honor Richard M. Scott, director of financial aid for the School of Medicine from 1970 to 1987.

THE JOHN SECONDI SCHOLARSHIP FUND. This endowed scholarship was established in memory of Dr. John Secondi (M.D. 1970).

THE JOHN N. SHELL ENDOWMENT FUND. This scholarship fund is provided by a bequest from the will of John N. Shell.

THE LESLIE M. SMITH AND EVELYN C. SMITH SCHOLARSHIP ENDOW-MENT FUND. This endowed scholarship fund was established in 1998 by Mrs. Evelyn Clark Smith, widow of Dr. Leslie McClure Smith (M.D. 1930), to be used to assist needy medical students. Preference is given to students from New Mexico and Kentucky.

THE FRANK C. AND CONNIE EWELL SPENCER MEDICAL SCHOLAR-SHIP FUND. This endowed scholarship fund was established in 1997 by Dr. Frank Cole Spencer (M.D. 1947) and his wife, Connie Ewell Spencer (B.A. 1946), to honor his medical class of 1947 on the occasion of its 50th reunion. The scholarship is used to assist worthy students who would not otherwise be able to afford to attend the School of Medicine.

THE DOROTHEA AND JOSEPH G. SUTTON SCHOLARSHIP IN MEDI-CINE. This scholarship was established in 1995 through a gift from the estate of Dr. Sutton (M.D. 1922) for the benefit of students with financial need who are pursuing the study of medicine.

THE HARLAN HOWARD TAYLOR SURGICAL SCHOLARSHIP. This endowment scholarship fund was established through the proceeds of a life income trust set up by the late Dr. Harlan Howard Taylor to benefit medical students going into surgical fields.

THE VANDERBILT MEDICAL SCHOOL SCHOLARSHIP FUND. This endowed scholarship fund was established in August 2000. The income from this endowment is to be used to provide unrestricted scholarship support to students within the School of Medicine.

THE IRENE BEDFORD WATERS SCHOLARSHIP This scholarship was established by W. Bedford Waters (M.D. 1974) in honor of his mother, Irene. The scholarship benefits medical students who have demonstrated financial need, with first preference going to minority students.

THE CHARLES E. AND MILDRED WORK SCHOLARSHIP. This endowed scholarship was established through a bequest gift by the late Dr. Charles E. Work (M.D. 1935). The income is used to provide financial aid to needy and worthy medical students.

THE FRED C. WATSON MEMORIAL SCHOLARSHIP. This scholarship is made on the recommendation of the School of Medicine to students selected by a committee based in Lexington, Tennessee, to students who are graduates of Lexington High School and/or are residents of Henderson County.

THE JOE AND HOWARD WERTHAN FOUNDATION FUND. The funds made available by this foundation to Vanderbilt University are to be given to those students in the School of Medicine needing financial assistance.

THE DR. DAVID HITT WILLIAMS MEMORIAL SCHOLARSHIP FUND. This fund was established in 1998 through the bequest of Eugenia F. Williams in memory of her father, a successful financier, professor of obstetrics and gynecology, and medical practitioner in Knoxville, Tennessee. The income from the endowment is to be used to assist worthy and deserving students in the School of Medicine.

THE WILLS SCHOLARSHIP FUND. Established in 2003 by W. Ridley Wills (B.A. 1956) and Irene Jackson Wills through the Wills Foundation to provide assistance to worthy medical students based on financial need.

Other Scholarships

Other scholarships are available outside of the need-based institutional financial aid program. They are as follows:

THE ELBYRNE GRADY GILL SUMMER RESEARCH SCHOLARSHIPS IN OPHTHALMOLOGY AND OTOLARYNGOLOGY. These scholarships provide support for medical student summer research in the areas of ophthalmology and otolaryngology.

THE MARY AND WILLIAM O. INMAN JR. SCHOLARSHIP FUND. This fund was established in 1985 by Miss Grace McVeigh (B.A. 1925) to benefit M.D./Ph.D. students.

MEADE HAVEN SCHOLARSHIPS IN BIOMEDICAL SCIENCES. Meade Haven scholarships in biomedical sciences have been endowed to provide support for medical students who have made a serious career commitment to obtain advanced experience and training in research in the biomedical sciences.

THE ANN MELLY SCHOLARSHIP IN ONCOLOGY. This scholarship is to provide medical students the opportunity to conduct research in the field of oncology. The scholarship recipients, to be known as Melly Scholars, would receive an integrative experience linking the basic sciences with their clinical outcomes. Such scholarships give in-depth exposure to research that addresses the cause and treatment of cancer. The scholarships have proven to be excellent experiences for medical students trying to determine whether to pursue a career in oncology and academic medicine. In the unlikely event that the field of oncology should be transformed or go out of existence, such as has happened with programs studying diseases like polio and tuberculosis, then in consultation with the donor and/or donor's children or grandchildren, another field of research would be chosen for the scholarship. This is to insure the continued recognition of Ann Melly's work in research and education.

THE HERBERT M. SHAYNE ENDOWMENT. Established in 2003 by the Shayne Foundation to provide tuition support to M.D./Ph.D. students during the M.D. portion of their training and includes a research laboratory stipend. The fund pays tribute to Herbert M. Shayne, a long-time supporter and board member of the medical school.

THE VANDERBILT PRIZE IN BIOMEDICAL SCIENCES SCHOLARSHIP. The Vanderbilt Prize nurtures the career, research, and studies of a promising woman beginning her M.D./Ph.D. studies at Vanderbilt and includes a funded scholarship for the student winner.

THE THOMAS HUGGINS WINN SCHOLARSHIP. Established in 1988 through a bequest from Fanny Edith Winn to benefit M.D./Ph.D. students.

Revolving Loans

THE AMA/ERF LOAN FUND. Funds are available to needy students through gifts donated by the American Medical Association Education and Research Foundation.

THE F. TREMAINE BILLINGS REVOLVING STUDENT LOAN FUND. Established by Elizabeth Langford and friends, this loan fund honors Dr. Billings and his many contributions as friend and internist. It is to be used for the education of worthy medical students.

THE BLOSSOM CASTER LOAN FUND. This fund was established by Milton P. Caster (M.D. 1949) in honor of his mother, Mrs. Blossom Caster.

THE O. D. CARLTON II LOAN FUND. This revolving loan fund was established by Hall Thompson in honor of O. D. Carlton II for needy third- and fourth-year medical students.

THE EDWARD F. COLE REVOLVING MEDICAL LOAN FUND. These funds are made available to students through contributions from Dr. Edward F. Cole, a Vanderbilt Medical alumnus.

THE FRANK M. DAVIS AND THEO DAVIS STUDENT LOAN FUND. This endowed loan was established by Frank M. Davis (M.D. 1934).

THE MAX EISENSTAT REVOLVING STUDENT LOAN FUND. This fund was established to honor the memory of Dr. Max Eisenstat.

THE TINSLEY HARRISON LOAN FUND. This fund was established to assist needy and worthy medical students by Dr. T. R. Deur, a Vanderbilt Medical School alumnus, in memory of Dr. Harrison, a former teacher and clinician at the school.

THE GALE F. JOHNSTON LOAN FUND. The funds donated by Gale F. Johnston are to be used as a revolving loan fund for students in the School of Medicine.

THE W. K. KELLOGG FOUNDATION LOAN FUND. This fund was established through donations from the W. K. Kellogg Foundation. THE LAUDIE AND EDITH MCHENRY REVOLVING LOAN FUND. This fund was established with the proceeds from the trust of Dr. Laudie E. McHenry (M.D. 1953) for students enrolled in the School of Medicine.

THE VANDERBILT MEDICAL FACULTY LOAN FUND. This fund is made available by donations from members of the School of Medicine faculty to be used to defray the educational costs of disadvantaged students.

THE MEDICAL LOAN FUND OF LIFE AND CASUALTY INSURANCE COMPANY OF TENNESSEE. Through donations from the Life and Casualty Insurance Company of Tennessee, needy students are provided revolving student loans.

THE MEDICAL SCHOOL STUDENT AID LOAN FUND. This fund is made possible through contributions from alumni and friends.

THE J. C. PETERSON STUDENT LOAN FUND. This fund was established in memory of Dr. J. C. Peterson to provide loan monies for deserving medical students.

THE COLONEL GEORGE W. REYER MEMORIAL LOAN FUND. This fund was established by Colonel George W. Reyer (M.D. 1918).

THE LEO SCHWARTZ LOAN FUND. This loan fund was established through contributions from Dr. Leo Schwartz.

THE ROBERT E. SULLIVAN MEMORIAL LOAN FUND. Through the generosity of Robert E. Sullivan, a fund has been established to assist worthy and deserving medical students.

THE ROANE/ANDERSON COUNTY MEDICAL SOCIETY FUND. This revolving loan fund is given to a needy medical student, with preference given, when possible, to students from Roane, Anderson, and Morgan Counties of Tennessee.

THE THOMPSON STUDENT LOAN FUND. This fund is to be used as a revolving loan fund for students in the School of Medicine from Middle Tennessee.

THE VANDERBILT MEDICAL SCHOOL ALUMNI REVOLVING LOAN FUND. This fund was established through contributions from alumni.

Medical Scholars Program

The Medical Scholars Program is sponsored by the school and offers interested students a one-year, in-depth, research experience in addition to the traditional four years of medical school. The goal of the Medical Scholars Program is to foster an interest in research among medical students that may eventually lead them to pursue careers in academic medicine. The research opportunities encompass all departments of the School of Medicine and are aimed at giving medical students the opportunity to contribute to the process of discovery in either clinical or basic research laboratories.

All medical students at the Vanderbilt University School of Medicine, except those enrolled in the MSTP program, are eligible to apply to the program. Formal application to the Medical Scholars Program may be made in the spring of each year. The duration of the program is twelve consecutive months, beginning July 1. A stipend of \$27,000 is provided for each student. Criteria for selection include a student's interest in research and an appropriate research topic and mentor. More than 200 faculty members serve as potential advisers. The types of research available to students range from patientoriented studies to epidemiological investigations to research at the molecular level. Interested students should contact Tina Hartert, M.D./M.P.H., director of the Medical Scholars Program.

Financial Information for Medical Master's Degrees and Other Doctoral Programs

Information for the 2010/2011 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	\$30,660
Tuition, 4th year	6,070

The total estimated cost of attendance for a first year student is \$55,190.

Master of Science in Medical Physics

Tuition, 1st year	\$28,860
Tuition, 2nd year	19,240

The total estimated cost of attendance for a first year student is \$53,990.

Doctor of Medical Physics

Tuition, 1st, 2nd years	\$30,060
Tuition, 3rd, 4th years	25,260

The total estimated cost of attendance for a first year student is \$54,590.

Master of Public Health and Master of Science in Clinical Investigation

Tuition, 1st year	\$28,890
Tuition, 2nd year	14,450

The total estimated cost of attendance for a first year student is \$50,350.

Master of Laboratory Investigation

Tuition (12 hours at \$1,200/hr.)

\$14,400

The total estimated cost of attendance for a first year student is \$35,110.

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	\$2,142
Activities and recreation fee	386
Activities and recreation fee (summer)	70
Transcript fee (one time only	30

Payment of Tuition and Fees

Fall semester tuition, fees, and other university charges are due and payable by 18 August. Spring semester tuition, fees, and other university charges are due and payable by 6 January. Summer charges are due and payable by 30 June.

Additional information can be found at *www.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 semester.

Withdrawal prior to the end of	Reduction
1st full week	100%
2nd full week	95%
3rd full week	90%
4th full week	80%
5th full week	75%
6th full week	70%
7th full week	60%
8th full week	55%
9th full week	50%
10th full week	40%

No refund after the 10th full week.

Late Payment of Fees

Charges not paid by 18 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 18 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. L' Catal

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 Subsidized and Unsubsidized Stafford Loan programs and Federal Direct Graduate PLUS loans. Private 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.

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 Medical Physics, Master of Science in Clinical Investigation, Master of Laboratory Investigation, and Master of Public Health. Courses in the School of Medicine are offered in both semester and year-long formats. Courses leading to the M.D. degree 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.

Anesthesiology

ANES 5500. Basic Anesthesiology. This pre-clinical elective course is for students at the completion of their first-year course work. It involves spending 2-3 hours per day between 0630-0830 hours. Students will rotate in the OR, ICU, acute pain service, OB Anesthesia, and PEDS Anesthesia. Students will experience all facets of anesthesiology. Summer following first year. Pai.

ANES 5611. Clerkship in Anesthesiology. This course is a four-week elective providing a multidisciplinary experience in Anesthesiology so that all students will rotate through the following venues: Adult anesthesia at VUH and/or VA; Cardiothoracic anesthesia; Pediatric anesthesia; OB Anesthesia; Neuro ICU/SICU/BICU; Acute pain service. In addition to participating in departmental lectures for residents, Grand Rounds, and M&M, students will be provided with a textbook, Basics of Anesthesia, 5th edition, and The Difficult Airway course manual for use during the elective. Students will keep the SEA curriculum cards and a departmental manual that are given at the beginning of the course. Student specific lectures will also be given during the course. Each student will take one evening call and one weekend day call to provide exposure to anesthesia for trauma and emergency surgery. Prior experience in anesthesia is not required. Fourth year. Boyle.

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 6150. Special Research Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

ANES 6200. Special Study—Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

ANES 7100. Special Clinical Study—Non-VU. 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.

Biochemistry

BCHM 5100. Vanderbilt Student Volunteers for Science. Medical students choosing the Vanderbilt Student Volunteers for Science (VSVS) elective will be placed in teams of three or four and go to middle school classrooms ten times during the semester to teach science lessons. Lesson manuals and kits are provided. The coordinator of VSVS will arrange times for the class visits based on VSVS team and teacher schedules. To-tal time commitment for the semester is 15 hours. This includes a practice

BCHM 5330. Molecular Aspects of Cancer Research. The course will consist of a focused series of seminars and discussions to explore the molecular basis of cancer. Seminars will rely heavily on extramural speakers who have recognized expertise in selected research areas. Students meet with each speaker for one hour immediately after each seminar. This provides an opportunity for students to meet internationally recognized scientists from a variety of academic and research institutions. Discussion sections will be led by a faculty member after each series of three to four seminars. This course may be taken for graduate credit by MSTP (M.D./ Ph.D.) students by registering through the Graduate School for Biochemistry 337. Prerequisite: Biochemistry or faculty permission. Heibert.

BCHM 6150. Special Study in Biochemistry Research. Students select a mentor and topic for a four-week research elective. Approval required. Fourth year.

BCHM 6200. Special Study—Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Biomedical Informatics

BMI 6150. Special Research Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

BMI 6200. Special Study—Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

BMI 7150. Special Study in Biomedical Informatics. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

Cancer Biology

CABI 6150. Special Research Study—Cancer Biology. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

CABI 6200. Special Study—Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Cell and Developmental Biology

CBIO 5680. Regional Review of Gross Anatomy. This course is designed to provide students with an opportunity for in-depth exposure to selected anatomic regions that may be relevant for their chosen specialties. Each student is expected to demonstrate his or her in-depth increase in knowledge through completion of a mutually agreed upon topic/project/ scholarly contribution. Students are expected to expand their anatomic understanding through individual efforts and by serving/teaching during the first year gross anatomy instructional sessions. This elective is especially recommended for students interested in all surgical specialties, emergency medicine, family medicine, internal medicine, neurology, pathology, pediatrics, or radiology. Students have the opportunity to perform prosections with the goal of expanding their knowledge base beyond the VMS I level. Attendance at relevant lectures, participation in the laboratory exercises, extensive teaching/mentoring interactions with VMS I is expected. Each student must meet with the course director to design an individualized program of study. Offered November, December, January and February. Fourth year. Nanney.

CBIO 6150. Special Research Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

CBIO 6200. Special Study—Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Emergency Medicine

EM 5100. EMS1: Introduction to PreHospital Care/EM. The objective of this experience is to expose first- and second-year medical students to clinicians early in their educational training and to give the students the opportunity to obtain exposure to clinician role models, so that the idealistic and altruistic attitudes which brought them to medicine may be sustained during the pre-clinical phase of their education. We also hope to provide an experience in which medicine is practiced: specifically, the common sense and practical considerations which influence approaches taken, outcomes achieved, and continuity provided in the health care system. Students are also encouraged to work with preceptors representing specialty careers of interest to the students. First and second year. Slovis.

EM 5200. EMS I: Introduction to Prehospital Care and Emergency Medicine. This course is offered to medical student teaching assistants only. Faculty approval required. Slovis.

EM 5950. Emergency Medicine. This required four-week clerkship introduces the senior medical student to the specialty of emergency medicine and reviews principles of emergency care that will benefit a graduate entering any specialty. Eleven clinical shifts spread across three different Emergency Departments during the month will offer students an opportunity to care for adult and pediatric patients with a variety of complaints. They will work closely with faculty and senior residents to formulate treatment plans and participate in procedures and other therapeutic interventions. Optional experiences with ground EMS, Lifeflight, and Emergency Ultrasound are also available. This clinical clerkship also has a significant didactic component, and students will usually attend 3-5 daily interactive lectures per day on weekdays. Afternoon lab sessions will allow practice of airway skills, splinting, and emergency procedures. Students will receive both BLS and ACLS training during the rotation. While this required clerkship is time intensive, and the required elements fill the scheduled four weeks, the course director will work with students to the extent possible to manage the scheduling challenges that may be encountered during residency interview season. Prerequisite: Completion of all third-year core clerkships. Registration occurs by lottery. Fourth year. Rohde.

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 6150. Special Research Study—Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

EM 6200. Special Study—Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

EM 7100. Special Clinical Study—Non-VU. 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 Vanderbilt. Approval required.

Interdisciplinary Studies

IDIS 5015. Interprofessional Learning. This course is for participants in the Interprofessional Education Fellowship program which will take an innovative team-based and patient-centered approach to health care, including work-based learning, longitudinal clinical experiences, and work in interprofessional teams. Working-learning teams, including professionals and

students from medicine, nursing, pharmacy, and social work, will work in clinics and in groups. Clinic activities will include home visits, group visits, and patient education sessions. Teams will meet weekly for a case-based seminar with other classroom-based activities, and teams may develop new projects in community interventions, support groups, home visits and coaching, and outcomes measurement. Approval required. First year. Harris.

IDIS 5025. Molecular Foundations of Medicine. Molecular Foundations of Medicine is designed to familiarize students with the cellular structures, biomolecules, and processes that constitute life, human health, and disease at the molecular level. Material will provide a mechanistic foundation for the medical curriculum and equip students to adapt and practice medicine in the future. The course will employ an integrated approach to teach underlying principles of biochemistry, cell biology, and genetics with an emphasis on human systems and medical conditions. The inclusion of clinical correlation sessions, small groups, and laboratory sessions will further integrate and broaden course material and relate molecular processes to the study of human disease. First year. Osheroff.

IDIS 5035. Structure, Function, and Development. The objective of this course is to provide students with the means to develop an effective understanding of the normal micro- and macroscopic structure, function, and development of the human body that will enable them to distinguish and begin to understand the impact of malformation, trauma, disease, degeneration, and dysfunction, and to envision the goal of therapeutic intervention and restoration. In the short term, it aims to prepare medical students for subsequent courses (Disease, Diagnosis, and Therapeutics) and clinical rotations through the development of an appropriate vocabulary, a knowledge base of essential information, and an awareness of the means to gain further information when required. In the long term, it aims to prepare physicians to appreciate the importance of an understanding of structure, function, and development as it is applied in clinical practice and to have a knowledge base appropriate for a medical physician, allowing them to communicate/interact meaningfully with those in other health specialties and participate in continuing medical education and life-long learning. The course will employ a coordinated, integrated approach to the presentation and learning of the disciplines of human gross anatomy, cell and tissue biology (histology), human development (embryology), and physiology in a context of clinical application. First year. Dalley.

IDIS 5045. Patient, Profession, and Society I. The course provides didactic and experiential learning in the essential social, ethical, economic and legal aspects of patient care and health policy, and in the psychological dimensions of illness and doctor-patient relationships. The second half of the course also emphasizes fundamental communication skills and provides training in patient interviewing. The experiential aspects of the course include a Clinical Preceptorship with a practitioner in an area of the student's choosing, rotation through a variety of Chronic Care Clinics, and the beginning of a Patient Partnership that will continue throughout the four years of medical school, including in Year One visits to the patient's home. First year. Robinson.

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 to-day, including the need to improve health care disparities, quality, and safety. First year. Miller.

IDIS 5065. Preclinical Intersessions. Each week will focus on a chronic illness or topic chosen because it illustrates basic science principles covered in prior blocks. Through large group discussion, case presentations, review of readings, and small groups, the course will provide comprehensive integration of basic science, clinical medicine, and the social, cultural and economic aspects of medicine. First year. Rodgers.

IDIS 5070. Disease, Diagnosis, and Therapeutics. The objectives of this course are to teach the pathogenesis and manifestations of disease and to introduce the fundamentals of diagnosis and pharmacologic as

well as nonpharmacologic therapy. Diseases, their recognition, and treatment will be presented in a systems-based format using an interdisciplinary approach to allow integration of pathobiology, clinical diagnosis, and therapy in a comprehensive manner. Principles of pharmacologic therapy will be presented in the context of relevant pathophysiology and how humans react to drug therapies. The course will utilize a variety of teaching modalities that include lectures, laboratory sessions focused on the gross and microscopic pathology of disease, and technology-based modalities that include computer-based lessons, as well as formats that will promote critical thinking (small group sessions, case-based learning that utilizes patients, and problem-based cases that will be taught by both faculty and students). Laboratory and imaging diagnosis will be presented in the context of the diseases to which these foundations are applied in order to prepare students for the next phase of their education in the clinical setting. Basic principles of radiologic imaging will be supplemented by correlation with manifestations and diagnosis of disease. Emphasis will be placed on the use of laboratory data in solving clinical problems. The role of nutrition in disease prevention and management will also be emphasized. The impact of disease and its treatment on public health and society as well as strategies for prevention will be explored. Second year. Atkinson.

IDIS 5072. Emphasis: Biomedical Informatics. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Biomedical Informatics. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5073. Emphasis: Community Health Initiatives and Outreach. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Community Health Initiatives and Health Outreach. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5074. Emphasis: Global Health. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Global Health. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5075. Patient, Profession, and Society II. The second year of Patient, Profession, and Society is a continuation of the first-year course designed to provide formal and experiential learning around critical social, cultural, and interpersonal issues associated with the practice of medicine. There are four primary segments of the course: Preventive Medicine and Community Health, Patient and Family Impact of Neurologic and Psychiatric Disease, Physician-patient Communication Skills, and Chronic Illness Experience continued from the first year. Second year. Smalley, Webb.

IDIS 5076. Emphasis: Public Healthcare. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Healthcare and Public Health Research and Management. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5077. Emphasis: Laboratory-Based Research. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Laboratory-Based Biomedical Research. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5078. Emphasis: Medical Education. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Medical Education. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5080. The Brain and Behavior. The Brain and Behavior module is directed towards helping students acquire a solid understanding of the human central nervous system and human behavior. The format of the module will include lectures, lab exercises, small group discussions, and patient and case presentations. In conjunction with Physical Diagnosis,

the skills training includes psychiatric interviewing, fundus exam, and neurological exam. The Brain and Behavior module will integrate three areas of medical science: (1) neuroanatomy, physiology, and biochemistry; (2) psychopathology and systems neuroscience; and (3) pathology, pharmacology, and radiology. Together, the course will provide the foundation necessary for an understanding of the clinical fields of Neurology and Psychiatry. Second year. Norden, Heckers.

IDIS 5082. Emphasis: Patient-Oriented Research. In consultation with faculty, each student who has selected this Emphasis area identifies a project and a mentor in Patient-Oriented Research. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5084. Emphasis: MSTP Project. Students in the joint MD/PhD program satisfy the Emphasis Program requirement by completing three lab rotations during the first and second year of MD training. Dermody.

IDIS 5085. Emphasis Program. The Emphasis Program is designed to provide students with the opportunity to pursue research and scholarly activities during the first two years of medical school, and thereby to prepare them to fill roles as leaders and scholars. In the fall semester, first-year students will be introduced to eight possible areas of study. In consultation with course faculty each student will then identify a project and a mentor in one of the eight areas. The second semester will be devoted to developing the research plan for the project. For eight weeks during the summer between first and second year, students will carry out their research. In the second year, students will be enrolled in the area of their project. Research will be completed and the process of writing up the project will begin. Students will present the results of their research and prepare their reports in publishable form. First year. O'Day.

IDIS 5086. Emphasis: Medical Humanities, Ethics and Policy. In consultation with faculty, each student identifies a project and a mentor in Medical Humanities, Ethics and Policy. After developing a research plan for the project, students carry out their research and present the results in a report in publishable form. First and second year. O'Day.

IDIS 5090. Capstone. The goal of this required four-week course for fourth-year students is to "spiral back" to basic sciences. Students will gain insights into how advances in basic sciences have impacted clinical practice. Eight diseases or cases will be covered (two per week), each led by an expert in the fields. Possible topics covered will include obesity, vision loss, post-traumatic stress disorder, rheumatoid arthritis, trauma, colon cancer, miscarriage, and staphylococcal infections. There will be a few hours of lectures and small group discussions with ample time provided for student-directed learning and discovery. Fourth year. Allos.

IDIS 5100. Primary Care Medicine, VUH. All fourth-year students will have a required four-week unit in an ambulatory primary care setting. Students will choose an experience in outpatient internal medicine, family medicine, or pediatrics. Practice sites include ambulatory medicine or pediatric clinics in the community. The clinic experience is supplemented by various conferences and a home health or hospice visit. In addition, all students will complete the core didactic lecture series that includes exercises in problem-based learning, role-plays to foster interview skills, and a program in risk management. Prerequisite: Medicine 5020, Pediatrics 5020, Surgery 5020. Fourth year. Gigante, Green, Miller.

IDIS 5150. Primary Care Medicine, Non-VU. Students may arrange a primary care experience outside of Nashville, subject to the approval of the course directors. Fourth year. Spickard, Gigante.

IDIS 5230. Beginner Spanish for the Medical Professional. Beginner Spanish for the Medical Professional includes a comprehensive grammar and vocabulary review, emphasizing communication between the health care provider and the Latino patient. The course underscores current essential cultural, demographic, and public policy issues affecting health care delivery to the Latino population in the United States. Class is conducted entirely in Spanish, however no previous knowledge of the lanugage is required. First and second year. Catanzaro.

IDIS 5235. Intermediate Spanish for the Medical Professional. Intermediate Spanish for the Medical Professional emphasizes spoken Spanish in the context of the health care provider and the Latino patient, including a comprehensive grammar review and offering extensive vocabulary related to the clinical setting. Cultural issues related to health care and the Latino patient are emphasized. Prerequisite: IDIS 5230 or faculty permission. Catanzaro.

IDIS 5236. Let Your Life Speak: Authentic Decision Making for Your Medical School Career. This is a course designed to give students in their first or second year of medical school a unique opportunity to address issues of personal identity and self-care. This course will provide a forum for learning and dialoguing with other students about real-life issues that impact your personal development as a medical professional, with specific emphasis on some of the unique issues that face women in medicine. Questions such as "How will I choose a specialty?", "How will I integrate family with career?", and "How will I maintain my passion for medicine?" will be addressed as we consider the anatomy of the decision-making process. Class will be guided group discussion format with various female physician guest speakers and each student will also receive a one-hour personal coaching session with the instructor during the semester. First and second year. Smith.

IDIS 5238. Wellness. This course will allow students to dedicate structured time to the pursuit of a wellness activity that has meaning for them and will serve to inform their practice of lifelong wellness. Requirements: (1) Proposal and Timeline--include prose describing why this project is important to you and what you want to get out of your personal project; (2) Monthly check-ins with elective instructor; (3) Submit and discuss a piece of prose describing what you learned from your experience and how this experience will inform your practice of lifelong wellness. Students will submit a proposal using the Wellness elective form to the Office of Student Records. The proposal should include a description of the project and an estimated timeline. Approval of the advisory college director is required. First and second year. Rodgers.

IDIS 5239. Contemplative Mind in Medicine. This course will provide a forum for learning effective stress reduction skills, a supportive and safe environment where medical students have an opportunity to discuss their experiences of the early years of medical education, and a personal experience for the foundation of a behavioral and preventive perspective in their future practice of medicine. First and second year. Peerman.

IDIS 5240. Health Care Economics and Medical Practice Management. This course is designed to familiarize students with current mechanisms of health care reimbursement for hospitals, physicians, and other components of the health care delivery system. Important U.S. health policies that affect the financing of health care will be explored, as well as the debate for and against the establishment of universal health coverage in the United States. Students will also become familiar with the array of practice options open to physicians for their professional practice and how these practice settings align with the physician's personal and professional goals. First and second year. Webb.

IDIS 5242. Backstage Pass to the Wards. This course will allow students the opportunity to complete a series of six to eight rotations throughout a variety of specialties and subspecialties at Vanderbilt University Hospital. It is expected that students will "shadow" and accompany the attending or resident physicians in their daily activities and participate in procedures/patient care at the discretion of their mentors. Opportunity for personal reflection and recording of insight into the various specialties will be possible via online forum and/or personal journal entries. Students are encouraged to ask relevant questions of their physicians and will be asked to reflect upon their experiences at the concession of all rotations. First and second year. Rodgers.

IDIS 5246. Boost Your Brain with a Book. Boost Your Brain with a Book is an elective for first and second year medical students. To obtain course credit, a student will read four books, one book per month for four months in the semester, and attend four book discussion sessions. Reading selections will vary.

IDIS 5252. Fundamentals of Health Care Quality Improvement. The elective course will provide students with an introduction to quality improvement science in a health care setting. The course will challenge students to think in an interdisciplinary manner when problem solving for quality improvement and will provide students with models and team-building strategies for

leading quality improvement initiatives in a variety of organizational settings. This course will be offered to students from the schools of Medicine, Management, and Nursing. First and second year. Hathaway.

IDIS 5320. Core Clerkships: Intersession. The intersessions are intended to address important clinical skills that apply to all medical domains. This is a pass/fail course. Third year. Lomis.

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 - Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required. First and Second Year Elective.

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 7100. Special Clinical Study-Non-VU. 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.

Medical Education and Administration

MADM 5700. Shade Tree Clinic Service Learning and Education. Enrolled students will commit to volunteering for a minimum of 20 clinic sessions, Tuesday or Saturday, during the months of July through April. Students will also be responsible for assisting with leading educational initiatives while in clinic such as teaching first and second year students during clinic and facilitating clinic wrap up. The course will additionally consist of 6-8 sessions spread throughout the year involving feedback through CELA cases and addressing topics such as how to be an effective teacher. All students will be required to complete a one-page assignment individually or as a group to reflect on the experience. Students will complete a project to be decided upon by the group. This could take the form of a quality improvement initiative, paper for publication, or any number of ideas depending upon the interest of the group. Fourth year. Miller.

MADM 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

MADM 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

MADM 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.

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. Leonard.

MED 5015. Introduction to Clinical Problem Solving. The course emphasizes the role of history, physical findings, laboratory studies, radiologic studies, and other modalities in solving clinical problems. The course covers a variety of problems that the students will face throughout their careers, including, but not limited to anemia, renal failure, gastrointestinal bleeding, jaundice, chest pain, dyspnea, thyroid nodules, vaginal bleeding, and dementia. The focus throughout the course is defining the problem, determining the diagnostic possibilities, developing a diagnostic strategy, including knowing how to interpret the relevant tests in order to establish a diagnosis. The lectures are taught by the medical specialists who routinely deal with the problem under discussion and who can discuss in depth the relevant clinical isues. The lectures are supplemented by a series of clinical problem sets. The course will also consider the value and limits of testing in general and consider in depth the issues of test sensitivity, specificity, and predictive value. Second year. Stein.

MED 5020. Medicine Core Clerkship. Third-year medical students participate in an eleven-week, inpatient clinical clerkship under the aegis of the Department of Medicine, utilizing 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. The clerkship is divided into three rotations of which two are general medicine and one subspecialty medicine. 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 all clinical and teaching activities of the service, including daily attending rounds, morning report, noon conferences, Grand Rounds, and the Thursday morning lecture series. In addition, students meet weekly in small groups with an assigned faculty member who conducts preceptor rounds for the entire eleven weeks. Spickard and Staff.

MED 5030. Clerkship: Remediation MED. This course is for the remediation of the third year Medicine clerkship.

MED 5100. Clinical Preceptorship Elective. The objective of this experience is to expose first- and second-year medical students to clinicians early in their educational training and to give the students the opportunity to obtain exposure to clinician role models, so that the idealistic and altruistic attitudes which brought them to medicine may be sustained during the pre-clinical phase of their education. We also hope to provide an experience in which medicine is practiced: specifically, the common sense and practical considerations which influence approaches taken, outcomes achieved, and continuity provided in the health care system. Students are also encouraged to work with preceptors representing specialty careers of interest to the students. First and second year. Powers.

MED 5130. Subspecialty Clinics in Medicine. The Department of Medicine offers a four-week unit for senior medical students to work in subspecialty clinics in the department. Students work one-on-one with faculty members or fellows in at least nine (9) clinic meetings per week. Students may choose from a variety of clinics including allergy/pulmonary, bone marrow transplant, cardiology, endocrinology, gastroenterology, hematology/oncology, infectious disease, nephrology, pharmacology, and rheumatology. Students may spend all of their time on one or two clinics or elect to work in a variety of clinics. Students arrange their schedules with attendings in various clinics, then obtain a signature for the course using an add form at least one month prior to the beginning of the chosen unit. Fourth year. Prerequisite: Medicine 5020. Spickard.

MED 5210. Clinical Pathophysiology and Pharmacology: Rounds on the CRC. The course consists of the in-depth discussion each week of the illness of one patient emphasizing the pathophysiology of the disease process and important issues in clinical diagnosis. Enrollment is limited so that the traditional question and answer interaction between physicians and students during rounds can be maintained. Patients will normally be selected from among those admitted to the Clinical Research Center and will, insofar as possible, reflect conceptually important or commonly encountered diseases and differential diagnostic problems. First and second year. Robertson. **MED 5240. Ethics, Law, and Medicine.** This course explores a variety of topics and problems at the intersection of ethical, legal, and medical concerns in the modern world of health care, including (to name a few) end of life decision making, reproductive technologies and abortion, genetic screening, and organ transplantation. Case-based and discussion oriented, the course has a secondary aim--to engage with others from different disciplinary backgrounds and training in order to foster greater appreciation for the multiplicity of perspectives associated with these (and similar) topics. Accordingly, the course is designed for, and available for enrollment to, students in the Schools of Divinity, Law, and Medicine. First and second year. Clayton.

MED 5248. HIV Counseling and Testing Elective. HIV rapid screening initiatives targeting urgent care, public health and emergency department clinics are components of a broad based HIV testing initiative to identify an estimated 1.2 million HIV infected persons unaware of their infection. Community provider Nashville CARES certifies students to perform HIV counseling and testing services within local emergency rooms (Vanderbilt, Metro General, Baptist Hostipal), neighborhood health clinics, and community venues serving high risk targeted populations through outreach and other health initiatives. Training includes CDC Counseling and Testing Training, Counseling Skills for HIV Positive Clients, Nashville CARES HIV CTS Policy and Procedure, Nashville CARES Confidentiality Law, and Orasure and OraQuick Testing and Screening Device Training. Students will provide public health screening and targeted CTS. Prerequisite: First year curriculum. Second year. Fall. D'Aquila.

MED 5350. History of Medicine. This course covers medical history from the Ancient Near East to the present. The course directors give the first few lectures for background; subsequent class meetings consist of guest lectures and reports by the students. Each student writes a paper or book review on a chosen aspect of medical history. The students who complete this course will be on their way to becoming humanistic physicians who understand where their profession has been and where it may be going. First and second year. Freemon.

MED 5430. Rheumatology Clinical Outcomes Research. The research will focus on analysis of patients seen at Vanderbilt with a particular rheumatic disease (e.g., ankylosing spondylitis, polymyalgia rheumatica), chosen with the student, to recognize variables which predict good or poor outcomes in specific patients. The research program will involve extensive review of patient records and entry of data into the Vanderbilt Rheumatology data base. Student participation in data analysis is encouraged. Fall 2008 elective areas include clinical research in rheumatic disease (Dr. Boomershine) and genetics of autoimmune diseases (Dr. Aune). Contact the faculty directly for more information. First and second year. Thomas.

MED 5555. 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. Prerequisite: Medicine 5020. Powers.

MED 5610. Clerkship in Clinical Nephrology. Students will participate in daily rounds with the nephrology attending, the nephrology fellow, and the medical resident assigned to the Vanderbilt Hospital 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 and develop an understanding of renal emergencies. This elective is designed to give the fourth-year student significant experience in practical clinical nephrology and prepare him or her for future house staff training. Prerequisite: Medicine 5020. Fourth year. Lewis.

MED 5611. Subinternship in Medicine, VU. A student may serve as a clerk on the Vanderbilt medical service otherwise staffed by attending physicians, one assistant resident, and one regular intern. Approximately three to four selected new patients per week will be assigned for initial evaluation and continuing care. The format provides an excellent opportunity to work closely with members of the clinical faculty in caring for patients with interesting diagnostic and management problems. The patients assigned will be selected for their teaching value, and the student will function as the sub-intern under the direct supervision of the assistant resident and attending physician. Rotations on in-patient cardiovascular, medical subspecialties, and general medicine are available. Prerequisite: Medicine 5020. Fourth year. Leonard.

MED 5613. Subinternship in Critical Care Medicine, VU. This course is a four-week subinternship 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. Prerequisite: Medicine 5020. Fourth year. Wheeler.

MED 5616. Subinternship in Medicine, VAH. The form of this clerkship is a substitute internship on the Veterans Administration Hospital medical wards, working in concert with the house staff team (assistant resident, intern, and one or two third-year medical students). The substitute intern will be assigned one or, rarely, two new patients each admitting day and will be responsible for their care under the direction of the assistant resident. The substitute 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. Prerequisite: Medicine 5020. Fourth year. Christman.

MED 5619. Subinternship in Critical Care Medicine, VAH. This subinternship at the Veterans Administration Hospital is intended to expose medical students to a variety of important 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 ICU/CCU as a sub-intern under the supervision of a medical resident, a pulmonary/ cardiology fellow, and both an intensive care unit 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 everythird-night in-house call schedule and will work directly with two residents and interns. 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 ICU and CCU pharmacology, airway management and mechanical ventilation, fluid/electrolytes management, nutritional intervention, and ICU ethics. Prerequisite: Medicine 5020, Surgery 5020. Fourth year. Massion.

MED 5620. Clerkship in Gastroenterology, VU. This clerkship offers a broad experience in all clinical phases of gastroenterology including diseases of the hepatobiliary system and pancreas. Seminars, rounds, and evaluation of current literature are regularly scheduled. Students will be actively involved in in-patient consultation and out-patient clinics. Exposure to gastrointestinal endoscopic techniques will be available. Prerequisite: Medicine 5020. Fourth year. Ness.

MED 5621. Clerkship in Gastroenterology, VAH. This clerkship at the Veterans Administration Hospital offers a broad experience in all clinical phases of gastroenterology including diseases of the hepatobiliary system and pancreas. Seminars, rounds, and evaluation of current literature are regularly scheduled. Individual instruction in sigmoidoscopy as well as exposure to other more specialized gastrointestinal techniques are available. Prerequisite: Medicine 5020. Fourth year. Smalley.

MED 5622. Clerkship in Hepatology. This clerkship offers a broad experience in diagnosis and management of patients with liver disease. Students participate actively in liver service activities and attend all didactic teaching sessions within the Division of Gastroenterology. Exposure to outpatient consultative and continuing care is emphasized. In addition, students will make hospital rounds daily with the attending hepatologist. Prerequisite: Medicine 5020. Fourth year. Perri.

MED 5635. Clerkship in Bone Marrow Transplant. For one month the student will participate in the activities of the bone marrow transplant service, including Tuesday and Thursday clinics, Monday teaching conferences, daily morning work/teaching rounds with the medical house staff, and other teaching conferences with the house staff. This elective is designed to provide in-depth experience with respect to the selection of patients for transplant procedures as well as with the management of transplant problems. Prerequisite: Medicine 5020. Fourth year. Goodman.

MED 5645. Clinical Nutrition and Metabolic Support. The Adult Nutrition Support Team, housed in the Vanderbilt Center for Human Nutrition, serves as a consultation service for patients who require parental and enteral nutrition at VUMC. Initial comprehensive consultation and follow-up care provide guidance in appropriate patient selection, determination of nutrient requirements and type of nutrition support, and ongoing clinical management to prevent complications and achieve nutritional goals. Typical patients include those who are critically ill with major abdominal surgery or trauma and those with serious underlying gastrointestinal disease. It is not unusual to see patients with life-threatening malnutrition. Students who choose this elective will participate as active members of the multidisciplinary consult team. The student will learn nutrition assessment methods and the skills to translate assessment findings into appropriate nutrition support interventions. Exposure will include intravenous and tube feeding interventions. Skills for typical prescription and monitoring of the nutrition support patient will be taught including macronutrient, fluid, electrolyte, acid-base, and glucose management. The student will have the opportunity to follow individual patients from initial consultation to daily follow-up care. There will be an opportunity to participate in the home malnutrition clinic as well. Prerequisite: Preclinical curriculum. Fourth year. Seidner.

MED 5650. Clerkship in Patient-Oriented Research. The Clinical Research Center is a combined inpatient/outpatient facility drawing patients from all divisions of Vanderbilt Hospital. Many of the most important discoveries pertaining to patient care are made in such a setting. Most of the patients have complicated disease presentations. Students have the opportunity to experience both basic and translational research in a clinical setting. Regular attending rounds will be made with the house staff and investigators, and there will be an opportunity for the student to participate in the evaluation of patients and conduct patient-oriented research. Prerequisite: Medicine 5020, Surgery 5020, Pediatrics 5020. Fourth year. Robertson.

MED 5660. Clerkship in Pulmonary Diseases, VAH. Students participate in an active inpatient pulmonary consult service (8-12 consults per week, 4-8 bronchoscopies per week) where they evaluate and present patients and review chest x-rays, chest CT scans, and pulmonary function tests on a daily basis. Clerks acquire skills in the work-up and management of common pulmonary problems including hypoxemia, pulmonary emboli, acid-base disturbances, CXR abnormalities, obstructive and restrictive lung diseases, infection, and neoplasm. Students also have the opportunity to be involved with outpatient evaluation and work-up of lung masses and participate in a weekly interdepartmental chest cancer conference. Other activities include weekly pulmonary clinic at the VA, weekly physiology/pathophysiology lectures, and weekly clinical case conference. Prerequisite: Medicine 5020. Fourth year. Massion.

MED 5670. Clerkship in Renal Pathophysiology, VAH. This clerkship offers active participation in the evaluation of patients with kidney disease

and fluid-electrolyte imbalance, in acid-base disorders, and in renalelectrolyte rounds, as well as experience in the hemodialysis program for acute and chronic renal failure. Plasmapheresis patients will also be seen as a part of the rotation. Students will see consults and also manage nephrology inpatients. Prerequisite: Medicine 5020. Fourth year. Stone.

MED 5680. Clerkship in Infectious Diseases. During the clerkship, the students will evaluate patients with infections as part of the infectious diseases consult service at VU Hospital. They should gain competence in diagnostic skills and in the management of infected patients, including choice and use of antibiotics. Special emphasis will be placed on understanding the epidemiology, pathophysiology, and natural history of infectious diseases. Students will be active participants in the management and follow-up of patients and will attend regularly scheduled rounds, conferences, and seminars of the Infectious Diseases Division. Prerequisite: Medicine 5020. Fourth year. Wright.

MED 5691. Subinternship in Cardiovascular Critical Care, VU. The student will actively participate in the management of critically ill cardiology patients hospitalized in the Cardiac Care Unit. Duties will include the management of patients with (1) cardiogenic shock, (2) complicated myocardial infarction, (3) complex coronary stenting, (4) Swan-Ganz catheters and continuous hemodynamic monitoring, (5) intra-aortic ballon pumps, (6) mechanical circulatory assist devices, (7) mechanical ventilation, and (8) vasoactive medications. The student will work closely with an assigned medical resident and be expected to write an admission history and physical examination and daily progress notes and present patients followed on daily work rounds to the entire team. The course will require three overnight calls with the assigned resident. The rotation will provide a significant "hands-on opportunity" for medical students to participate in the management of critically ill patients. The paired resident/single medical student model will provide a great deal of time for interactive teaching and learning. Note: Because of the intense nature of this clerkship, students will not be excused for intern interviews or other personal matters during this rotation. Prerequisite: Third year core clerkships. Fourth year. DiSalvo.

MED 5710. Clerkship in Rheumatology Center. 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. Emphasis is placed on learning 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. Prerequisite: Preclinical curriculum. Fourth year. Huston.

MED 5730. Clerkship in Clinical Cardiology. This consultative cardiology experience was restructured in 2005 to offer new learning opportunities for medical students wishing to refine their skills in cardiovascular diagnosis. It provides both inpatient encounters and personalized instruction in physical diagnosis and EKG reading. The student will see new patients in consultation with cardiology faculty at Vanderbilt and at the VA Hospital. A highlight of the experience is a private weekly patient presentation to-and examination of the patient with--a senior cardiac physician at Vanderbilt. The student will be instructed in the use of a heart sound simulator which has been demonstrated to improve physical diagnosis skills. Eight didactic sessions on EKG interpretation are provided during the four-week rotation. Finally, weekly conferences to attend include: Clinical Cardiology (2), Echocardiography, Nuclear Medicine, and Cardiology Grand Rounds. Prerequisite: Medicine 5020. Fourth year. Campbell.

MED 5735. Palliative Care. Students will rotate through VUMC, the VA Hospital, and Alive Hospice 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. Students will spend roughly two weeks at VUMC and the remainder of

time equally at the VA Hospital and Alive Hospice. 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. At Alive Hospice, they will accompany members of the IDT on home visits and learn more about their various roles in end of life care. In addition, students will spend time on the inpatient hospice units. 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. Prerequisite: Preclinical curriculum. Fourth year. Karlekar.

MED 5737. Palliative Care: Hospice. This semester-long elective for first- and second-year students provides the opportunity to spend time at Alive Hospice, under the direction of the medical director, rounding in their inpatient hospice residence (a free standing, independent, thirty-bed hospice facility). Students will be exposed to a variety of patients (age, cancer and non-cancer diagnoses, AIDS, differing symptom management challenges, etc.), and will have the opportunity to interact with patients, families, and interdisciplinary staff. It is intended to expose the student to this specific paradigm of care at the end of life, enhancing awareness of the reality of the dying process, the importance of hospice philosophy, and the integration of an interdisciplinary team concept, and to provide a "take home" symptom management protocol. Students will develop a deeper skill in communication and benefit from the continuity of understanding end of life issues and symptom management. First and second year. Tribble.

MED 5740. Clerkship in Pulmonary Consultation. 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 pleural biopsy procedures, and attending joint pulmonary conferences. Prerequisite: Medicine 5020. Fourth year. Wheeler.

MED 5760. Clerkship in Rheumatology. Time will be spent primarily in the VUH and VA outpatient clinics, but also will include consultation on patients with rheumatologic problems. Patient evaluations will emphasize pathophysiology and management decisions. A weekly rheumatology conference discusses related topics. Prerequisite: Preclinical curriculum. Fourth year. Thomas.

MED 5770. Clerkship in Clinical Endocrinology. This elective is designed to afford students an intensive experience with both inpatients and ambulatory patients. The student will be a member of the inpatient endocrine consultation team, which consists of an endocrinology staff physician, a fellow, and residents. Students will work up assigned patients, discuss them with other members of the team, and follow them throughout hospitalization. The focus will be on diagnostic and therapeutic decision making for hospitalized patients. In addition, the student will attend a variety of endocrine and diabetes clinics, including clinics with special emphasis on pituitary disorders, thyroid-parathyroid disease, and ambulatory diabetes management. Prerequisite: Medicine 5020. Fourth year. Jagasia.

MED 5780. Subinternship in Medical Oncology. This subinternship will provide the student with a broad overview of clinical oncology. Inpatient exposure will be centered at Vanderbilt Hospital, where the student will assist the oncology fellow 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 will attend two to three outpatient clinics per week and see patients with the oncology attendings. During the rotation, the student will also attend the Division of Oncology conferences at Vanderbilt. Prerequisite: Medicine 5020. Fourth year.

MED 5790. Clerkship: Clinical Dermatology. This elective will be centered on teaching in the out-patient setting with direct faculty interaction. The primary location of clinic assignments will be in Dermatology Clinic on the third floor of the Vanderbilt Clinic facilities. Selected clinics will occur at the 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. Rotations in July require special permission. Zic.

MED 5820. Spirituality in Medicine. Weekly one-hour meetings with journal club format. Articles will represent diverse faiths and points of view. Goals will be to develop broad-based, universal definition of spirituality and to explore the impact of spirituality in health, disease, and treatment. Also will discuss death, dying, and diversity issues. First and second year. Tarpley.

MED 5828. Clinical Ethics Consultation. Ethics consultation has been utilized for a number of years in the U.S., but not without difficulties and controversies. Students will participate in ethics consultation and also explore the different models of ethics consultation and their strengths and weaknesses. They will also have the opportunity to examine the different theoretical frameworks that undergird these different models with an eye toward their practical implementation. In addition to participation in ethics consultations, students will also prepare a short presentation to be made to the members of the Center for Biomedical Ethics and Society and will write an essay of between 3,000 and 5,000 words exploring an ethical question in clinical medicine. Prerequisite: Preclinical curriculum. Fourth year. Bishop.

MED 5910. Preceptorship at Siloam Family Health Center. The objective of this elective is to expose second-year medical students to clinical health care at a community clinic. Students will visit the Siloam Family Health Center once a week during its hours of operation (Monday, 6:00-8:00 p.m., Thursday, 6:00-8:00 p.m., or Saturday, 10:00 a.m.-noon). During their visits, students will shadow a physician. They may also have the opportunity to help in history taking and physical diagnosis. Second year. Prerequisite: Completion of first-year curriculum. Gregory.

MED 5930. Clerkship in Health Promotion. Monthly elective for one student interested in health education and health promotion in clinical and outpatient programs. The student will observe and participate in the Cardiac and Pulmonary Rehabilitation Programs at the Dayani Center. Additionally, the student may elect to spend a portion of this elective in the areas of smoking cessation, behavioral health, nutrition, exercise science, or corporate health. An overview of each area not chosen will be provided. Students are expected to spend approximately half of their time in research related to the measurement of clinical outcome inpatients within the rehabilitation program. The format of the clerkship will include lectures, case discussions, readings, and direct patient contact. A mentor, through a multidisciplinary approach, will guide the student to health promotion. To personalize the experience, students will receive their own fitness assessments, nutritional counseling, stress assessments, and free use of the Dayani Center facilities during the clerkship month. Students will be involved in a one-day a week clinic at Page-Campbell under the direction of a physician. In addition, students will be trained weekly in EKG interpretation by co-supervising 12-lead exercise tests with Dayani staff. It is advised that students contact the course instructor prior to clerkship. Prerequisite: Preclinical curriculum. Fourth year. Not offered January, February, or March. Klint.

MED 5940. Rheumatology Clinical Research. Students will be given a topic within a long-term data base of patients with rheumatic disease for intensive investigation during a one-month period. The student will be expected to acquire skills in outcome research. The possibility of participating in this elective for two months may be considered. Requires a Special Study Research Petition. Fourth year. Thomas.

MED 5960. Clerkship in Clinical Hematology. For one month, the student will participate in the daily clinics of the hematology service. Additionally there is an opportunity to attend the rounds of the malignant hematology service and/or the benign hematology service at Vanderbilt University Hospital. The student will be able to attend clinical conferences. This clinical elective is designed to provide a broad in-depth exposure to both benign and malignant hematology under the direct supervision of the hematology faculty. Prerequisite: Medicine 5020. Fourth year. Stein.

MED 5970. Quality Improvement Practicum. The Quality Improvement (QI) Practicum aims to provide senior students foundational knowledge

in quality improvement and patient safety principles and enable practical application of this knowledge in executing a quality improvement project. As a result of this effort, medical students will appreciate the role that QI initiatives play in bettering both health systems and individual patient care and become equipped to take a leading role in such initiatives in the future. With the support of the Vanderbilt chapter of the Institute for Healthcare Improvement (VIHI), students will choose a mentor and project related to QI and patient safety. Some students may choose to join existing projects, while others will create their own. During the designated month, students will work with their mentor to execute their project. Additionally, during this month students will meet together to discuss the progress of their projects as well as discuss case studies, listen to didactic presentations, and participate in departmental MMI conferences. Selected readings will be assigned from QI papers and textbooks, and all students will complete the IHI Open School online certificate. In order to enhance the educational and practical experience, optional periodic group meetings will be provided in the months leading up to the elective. Fourth year. Hathaway.

MED 6100. Special Clinical Study--Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

MED 6150. Special Research Study--Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

MED 6200. Special Study--Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

MED 7100. Special Clinical Study--Non-VU. 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--Non-VU. Each student arranges an independent study with a mentor and completes a period of research work away from Vanderbilt. Approval required.

Microbiology and Immunology

MICR 5020. Microbiology and Immunology. This course provides a comprehensive course of microbiology and immunology encompassing the molecular cell biology of microbial agents and the immune system, review of pathogenic bacteria, viruses, fungi, protozoa, and parasites. The course consists of lectures, conferences, and laboratory sessions and problem-based small group discussions focused on different pathogenhost relationships. Required First Year. Van Kaer.

MICR 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

MICR 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Neurology

NEUR 5020. Neurology Core Clerkship. The rotating students of the third-year class are alternately assigned to two 2-week (total=4 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. Riebau and staff.

NEUR 5611. Neurology Consultation Service, VAH. Students are assigned to the consultation service where they are responsible for working up and following patients under the supervision of the Veterans Administration Hospital chief neurology resident and faculty. This rotation provides the student with opportunities to evaluate patients with neurologic complications of medical, surgical, and psychiatric disease. Prerequisite: Neurology 5020. Fourth year. Wiley.

NEUR 5612. Clerkship in Neurology. Senior students will evaluate neurological consultations at VU Hospital and The Vanderbilt Clinic under the supervision of residents and faculty. Opportunities to participate in EEG, EMG, ultrasound, sleep studies, botox injections, and others are available upon request. Prerequisite: Neurology 5020. Fourth year. Riebau.

NEUR 5613. Clerkship in Pediatric Neurology. Senior students will evaluate neurological consultations at VU Hospital and participate in pediatric neurology outpatient clinics at Vanderbilt Children's Hospital. Prerequisite: Pediatrics 5020, Neurology 5020. Fourth year. Paolicchi.

NEUR 5614. Clinical Neuro-oncology. Students will see consults and admissions to VUH and VAMC with cancer of the nervous system and neurological complications of cancer. They will also attend pediatric neuro-oncology clinic one morning per week and will have the opportunity to follow neurosurgical neuro-oncology patients before, during, and after surgery. Prerequisite: Neurology 5020. Fourth year. Moots.

NEUR 5620. Subinternship in Stroke and Neurorehabilitation. This is a four-week rotation in which the student will take supervised primary care of 5-6 patients on the VUMC Stroke Service, reporting directly to the resident and attending. The student will also round on stroke and other neurological patients at the Vanderbilt Stallworth Rehabilitation Hospital. The rotation also includes participation in stroke research protocols, learning about diagnostic procedures such as MRI and CT imaging, carotid and transcranial Doppler ultrasound studies, and other laboratory tests. At the Rehabilitation Hospital, the student will have the opportunity to participate in team meetings where the rehabilitation program for each patient is planned with physical, occupational, and speech therapists, social workers, etc. Prerequisities: Neurology 5020, Medicine 5020. Fourth year. Kirshner.

NEUR 5655. Subinternship in Neurocritical Care. The comprehensive and collaborative care of a wide range of critically ill patients that have primarily life- or organ-threatening diseases or injuries to the brain, spinal cord, peripheral nerves, or muscles. There will be exposure to a wide range of medical and surgical clinical problems such as hypertension, vascular disease, respiratory dysfunction, fluids and electrolytes, acid-base, COPD, diabetes mellitus and insipidus, myocardial dysfunction, cardiac dysrhythmias, pancreatitis, end-of-life care, infectious issues, airway management, ICU pharmacology, etc. There will be exposure to the standard, pertinent, and evidence-based issues relevant to intensive care management. These may include mechanical ventilation, vascular cannulations, point-of-care ultrasonography, resuscitation, neuroprotection, nutritional issues, etc. The opportunity to go to the OR with the assigned patients, for their neurosurgery and/or anesthesiology is available and encouraged. The students will have all associated clinical responsibilities and will participate in all the usual house-staff (interns, residents, and fellows) activities, including procedures, lectures (including the monthly ethics rounds), patient care, diagnosis, and management. Students are expected to attend the Fundamentals of Critical Care Support course (FCCS) lectures and take the exam for FCCS certification at the end of the rotation. 100 percent commitment is required. No overnight call, but may need to stay late. One day off per week. Satisfies the surgical subinternship requirement. Prerequisite: Third year core clerkships. Fourth year. Barwise.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

NEUR 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

NEUR 7100. Special Clinical Study-Non-VU. 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.

Non-Medical Studies

NMED 6200. Special Study-Pre-Clinical. Students who are approved to take a course in another school at Vanderbilt are registered for a non-medical elective credit. Approval required. First and Second Year.

Obstetrics and Gynecology

OBGN 5020. Obstetrics-Gynecology 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-onehalf 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-onehalf-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. Rush and Staff.

OBGN 5030. Remediation: OB/GYN. This course allows a student to do a period of remediation of core clerkship requirements for Obstetrics and Gynecology.

OBGN 5620. Clerkship in Maternal/Fetal Medicine. During this rotation, the student receives advanced training in high-risk obstetrics at the student level. Students help to direct both the antepartum and postpartum care of several complications of pregnancy, including preterm labor, PPROM, and pregnancy-induced hypertension. By the end of the rotation, the student should be familiar with the main complications of pregnancies, 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 in obstetrical clinic, with additional time spent in diabetic clinic, obstetrical ultrasound clinic, and the clinics of several MFM attendings; weekly fetal monitor conference; bimonthly obstetrical ultrasound conference; 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. Prerequisite: OBGN 5020. Fourth year. Carpenter.

OBGN 5640. Clerkship in Reproductive Endocrinology and Infertility. During this rotation, the student receives training in the management of gynecologic endocrine and infertility patients. The student participates in the evaluation and management of women with gynecologic endocrinology problems and the infertile couple, including hysterosalpingography and sonohysterography, and assists in their operative care, which includes experience in advanced laparoscopic techniques. By the end of the rotation, the student should be familiar with the diagnosis, evaluation, and treatment of the common causes of infertility, and the evaluation of other gynecologic endocrine disorders. Specific learning activities include attendance in the REI Clinic and patient management discussion; assistance with the operative cases of the service, with attention paid to the preoperative evaluation, as well as the postoperative management; observation of vaginal ultrasound, including follicular monitoring associated with ovarian stimulation; and attendance at the weekly reproductive endocrinology and infertility seminar. Prerequisite: OBGN 5020. Fourth year. Lucas.

OBGN 5645. Subinternship in Benign 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. Prerequisite: OBGN 5020. Fourth year. Anderson.

OBGN 5650. Subinternship in 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. 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. Prerequisite: OBGN 5020. Fourth year. Gold.

OBGN 5660. Urogynecology: Female Pelvic Medicine and 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 postoperative 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 physician exam of pelvic floor defects are also emphasized. Prerequisite: OBGN 5020, Medicine 5020, Surgery 5020. Fourth year. Zimmerman.

OBGN 6100. Special Clinical Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical work. Approval required.

OBGN 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

OBGN 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required. First and Second Year.

OBGN 7100. Special Clinical Study-Non-VU. Each student arranges an independent study with a mentor and completes a period of clinical work away from Vanderbilt. Approval required.

OBGN 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 5260. The Eye as a Sentinel of Systemic Disease. Virtually every systemic disorder can result in ocular manifestations. Regardless of area of specialization, physicians will encounter patients with eye complaints. Distinguishing between benign conditions and those eye signs which herald serious systemic disease can be critical. This elective will be structured as a problem-based approach in which students participate in the differential diagnosis. The course will also familiarize the student with the distinguishing features of many eye disorders. Following the course, students will be able to recognize common ophthalmic conditions and understand the significance of many visual symptoms and eye findings. First and second year. Sternberg.

OPH 5610. Clerkship in Ophthalmology. An intensive clinical experience in ophthalmology which includes inpatient, outpatient, and operating room assignments. There is one-to-one supervision by the resident staff and Ophthalmology Department staff. At the completion of this clerkship, the student should have mastered all basic ophthalmologic exam techniques including visual acuity, external exam, slit lamp examination, ophthalmoscopy, and visual fields. Students must receive pre-approval from the Department of Ophthalmology for this clerkship in July, August, and September. Prerequisite: Surgery 5020. Fourth year. Melson.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

OPH 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required. First and second year.

OPH 7100. Special Clinical Study-Non-VU. 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.

Orthopaedics and Rehabilitation

ORTH 5611. Subinternship in Foot and Ankle Orthopaedic Surgery. The student will be asked to evaluate patients with foot and ankle disorders in both inpatient and outpatient settings. The student will be expected to participate in preoperative and postoperative patient evaluation and management, as well as surgical management. At the conclusion of the rotation, the student should have an in-depth understanding of arthritis, foot and ankle fractures, sports medicine of the foot and ankle, and common deformities. Orthotic and pedorthic management will also be taught. Prerequisite: Surgery 5020. Fourth year. Thomson.

ORTH 5612. Subinternship in Adult Hand Orthopaedic Surgery. The course provides hands-on exposure to adult hand surgery. The student will be able to integrate medical and surgical knowledge in the care of patients with congenital hand deformities and musculoskeletal hand injuries in both inpatient and outpatient settings. Emphasis will be placed on initial evaluation, preoperative and postoperative management. Prerequisite: Surgery 5020. Fourth year. Watson.

ORTH 5613. Subinternship in Orthopaedic Oncology. The course provides hands-on exposure to musculoskeletal oncology and adult orthopaedics. The student will be able to integrate medical and surgical knowledge in the care of orthopaedic patients, in both inpatient and outpatient settings. Prerequisite: Surgery 5020. Fourth year. Holt.

ORTH 5614. Subinternship in Pediatric Orthopaedic Surgery. This course will provide the student with experience assessing and managing pediatric orthopaedic surgical patients. Emphasis will be placed on pertinent history taking, evaluation of the child, and decision making and treatment in both inpatient and outpatient settings. Prerequisite: Surgery 5020. Fourth year. Mencio.

ORTH 5615. Subinternship in Reconstructive Orthopaedic Surgery. The course provides hands-on exposure to adult reconstructive surgery. The student will be able to integrate surgical knowledge in the care of orthopaedic patients in both the inpatient and outpatient settings. Prerequisite: Surgery 5020. Fourth year. Shinar.

ORTH 5616. Subinternship in Orthopaedic Rehabilitation. This course is designed to provide hands-on exposure to orthopaedic and neurological rehabilitation. Many of these patients have had surgical procedures, and the student will have an opportunity to follow the patients post-acutely. The student will be asked to integrate medical and surgical knowledge in the care of rehabilitation in the hospital and outpatient

clinic. The attending physician on the rehabilitation service will define participation in patient care. The student will be expected to participate in the treatment of individuals with significant orthopaedic and neurological impairment who require long-term hospitalization to achieve maximal independence. The primary responsibility is the care of those patients with spinal cord injury, amputations, multiple trauma traumatic brain injury, and general debilitation. Outpatient clinics are available to expose students to the long-term problems which these patients encounter. Prerequisite: Surgery 5020. Fourth year. Groomes.

ORTH 5617. Subinternship in Adult Spine Orthopaedic Surgery. The student will be asked to integrate medical and surgical knowledge in the care of patients with spine-related deformities and injuries in the hospital and outpatient clinics. Students will receive an introduction to outpatient assessment and inpatient management of individuals with a wide variety of spinal disorders. The course is designed to provide a proper assessment of patients with neck and low back pain, as well as spinal injuries with neurological involvement. The student will be expected to participate actively in the emergent, preoperative, surgical, postoperative hospital, and outpatient diagnostic and therapeutic care of orthopaedic patients. Prerequisite: Medicine 5020, Surgery 5020. Fourth year. Spengler.

ORTH 5618. Subinternship in Sports Medicine. The course is designed to provide hands on exposure to orthopaedic sports medicine. The student will be asked to integrate medical and surgical knowledge in the care of patients with sports-related injuries in the hospital and outpatient clinics. Participation in patient care will be defined by the chief resident. The student will be expected to participate aggressively in the emergent, preoperative, surgical, postoperative hospital, and outpatient diagnostic and therapeutic care of sports medicine patients, athletic injuries, and all injuries of the knee and shoulder. Prerequisite: Surgery 5020. Fourth year. Spindler.

ORTH 5619. Subinternship in Adult Orthopaedic Trauma. The course is designed to provide hands-on exposure to orthopaedic traumatology. The student will be asked to integrate medical and surgical knowledge in the care of trauma victims and musculoskeletal injuries in the hospital and outpatient clinics. Participation in patient care will be defined by the chief resident. The student will be expected to participate aggressively in the emergent, preoperative, surgical, postoperative hospital, and outpatient diagnostic and therapeutic care of orthopaedic patients. Prerequisite: Medicine 5020, Surgery 5020. Fourth year. Obremskey.

ORTH 5620. Primary Care Orthopaedics. This course is designed to provide students interested in primary care or non-surgical specialties with an in-depth experience in adult musculoskeletal disease. Focusing primarily on the examination and evaluation of patients with musculoskeletal problems, the student will rotate through general and specialty orthopaedic clinics and participate in the evaluation and treatment of acute orthopaedic trauma in the emergency room. Participation in daily orthopaedic conferences and teaching rounds will broaden the scope of the student's exposure to orthopaedic surgery. The presentation of a case-focused conference at the conclusion of the rotation will be expected of each student. This course is not recommended for those intending to pursue a career in orthopaedic surgery. Prerequisite: Surgery 5020. Fourth year. Holt.

ORTH 5625. Subinternship in General Adult Orthopaedics, VAH. This course is based in the Veterans Administration Hospital and provides a wide exposure to in-patient and out-patient orthopaedic surgery ranging from trauma and sports medicine to reconstruction. The student is expected to integrate book knowledge with patient care. A tremendous hands-on experience is available to a host of musculoskeletal pathology. Prerequisite: Surgery 5020. Fourth year. McHugh.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

ORTH 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

ORTH 7100. Special Clinical Study-Non-VU. 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 5950. Laryngology. This course is an elective in otolaryngology focusing on problems with the voice, airway and swallowing. It is based out of the Vanderbilt Voice Center and includes participating in the clinical and surgical management of patients with disorders affecting the larynx and the upper aerodigestive tract. Students will spend time in the voice center clinics with a staff laryngologist, learning the specialized evaluation of the voice and swallowing patient. This would include hands-on experience with laryngeal videostroboscopy. Students would also learn the specifics of the standard otolaryngology head and neck examination. Other members of the elective faculty include voice scientists and speech language pathologists who regularly perform voice evaluations and therapy for our patients. Significant time would also be spent in the operating room learning endoscopic management of laryngeal pathology and airway disorders as well as the surgical management of vocal fold paralysis. Prerequisite: Surgery 5020. Fourth year. Garrett.

OTO 5970. Subinternship in Otolaryngology. Students will work with the otolaryngology staff and residents on the otolaryngology service at Vanderbilt University Hospital participating in the diagnosis and treatment of patients with otolaryngologic and head and neck diseases. Attendance at the weekly otolaryngology grand rounds is mandatory. Prerequisite: Surgery 5020. Fourth year. Sinard.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

OTO 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

OTO 7100. Special Clinical Study-Non-VU. 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 5610. Clerkship in Autopsy Pathology. The student will assist in post-mortem examination with the full-time staff and will correlate the clinical and pathological features in an attempt to understand the pathogenesis of the fatal disease processes. Recommended for students considering residencies in pathology. Prerequisite: Preclinical curriculum. Fourth year. Wills.

PATH 5620. Clerkship in Surgical Pathology. The experience will include the Surgical Pathology areas in both Vanderbilt University Hospital and Monroe Carrell Jr. Children's Hospital. The student will work with the surgical pathology faculty, fellows, and residents in evaluating gross and microscopic material from current cases. Emphasis will be placed on introducing the student to the relationship that surgical pathologists maintain with clinical colleagues in caring for patients. In this elective, there will be opportunity to see medical biopsies and larger specimens from most surgical specialties. Appropriate short research projects will be available for the interested student. Opportunities exist for the student to work in Cytology and subspecialty areas also, depending on interest. Prerequisite: Preclinical curriculum. Fourth year. Johnson.

PATH 5630. Clerkship in Clinical Pathology. Clinical pathology is composed of multiple diverse laboratory services that provide diagnostic testing for all areas of medical practice: blood bank, clinical chemistry, special chemistry (including toxicology), hematology and urinalysis, special hematology (bone marrow and lymph nodes analysis), hemostasis, microbiology and virology, molecular infectious disease, molecular genetics, and immunopathology (including flow cytometry). The student may rotate in one or multiple labs. Training is individualized based on the interests and future plans of the student. 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 the tests in the areas of the lab through which the student has rotated for diagnosis and monitoring of diseases. Prerequisite: Preclinical curriculum. Fourth year. Laposata.

PATH 5650. Clerkship in Clinical Microbiology. The basic goal of this one month rotation is to gain an appreciation of clinical microbiology, including basic bacteriology, mycology, and mycobacteriology. The preceptor method will be used in doing bench work under supervision followed by independent bench work. Self-education through reading the text, Koneman: Basic Microbiology, will be required. Unusual and interesting cultures can be pursued by review of patient charts or examination of the patient, if appropriate. The clinical aspects are coordinated through the infectious disease service and include participation in their rounds. Prerequisite: Preclinical curriculum. Stratton.

PATH 5680. Clerkship in 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. This course does not meet in December. Prerequisite: Third year core clerkships. Fourth year. Deering.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

PATH 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

PATH 7100. Special Clinical Study-Non-VU. 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 Vanderbilt University 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. Fleming and Children's Hospital Staff.

PED 5400. Pediatric Clinical Rounds. The pediatric chief residents will lead a small group of students in examination of pediatric patients at the Vanderbilt Children's Hospital. Our goal is to provide an enjoyable and provocative opportunity to supplement the Physical Diagnosis course with

hands-on pediatric experience. The course is offered in March and April. Second year. Varies.

PED 5611. Subinternship in Pediatric Medicine. Students will serve as externs on the wards of Monroe Carell Jr. Children's Hospital at Vanderbilt. They will serve on a team and assume intern responsibilities with supervision and countersignature of orders/notes by second- and thirdyear residents. Patient assignments will usually be limited to five admissions per call night. Externs may pick up patients on non-call days depending on their census. Call is every fourth night. This rotation fulfills the subinternship requirement in the fourth year. Students may request any of the four teams, but placement is dependent on availability. The teams include Hazinski (Hospitalist and Pulmonology); Karzon (Neurology and Gastrointestinal); Christie (Cardiology and Nephrology); and Team D (Nonresident hospitalist service). Inclusion on Team D requires approval from the course director. In order to ensure the strong clinical experience which characterizes this elective, each clinical clerkship is built into the housestaff rotational schedule. Therefore, the Pediatric Service relies heavily on each student who is accepted into this course. We ask that the student consider his/her enrollment as a strong commitment to serve. Students may be excused from ward duties for no more than three days for interviews or other absences, unless special permission is obtained from the course director and the associate dean for medical student affairs. Prereguisite: Pediatrics 5020. Fourth year. Fleming.

PED 5635. Subinternship in Pediatric Hematology/Oncology. Upon completion of this course, students 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 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. Students will 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, students will see both new patients and patients returning for therapy. Students will take a history from the family, perform a physical exam, interpret lab tests, present these patients to the faculty, and write notes. Students 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). Prerequisite: Third year core clerkships. Fourth year. Domm.

PED 5650. Clerkship in Pediatric Developmental Medicine. Students will learn about a variety of developmental disabilities in infants, children, and adolescents, including developmental delays, cognitive/intellectual disability, Down syndrome, learning disabilities, attention deficit hyperactivity disorder, behavior disorders, autism spectrum disorders, motor disorders, and speech-language disorders. They will observe in-depth evaluations by developmental pediatricians and psychologists at the Center for Child Development. They will also participate in several didactic learning sessions. In addition, students will visit community agencies serving children with special needs and their families. This rotation provides minimal opportunity for direct patient care experience, but instead offers several venues for learning about developmental and behavioral disorders. Prerequisite: Pediatrics 5020. Fourth year. Reimschisel.

PED 5680. Clerkship in Pediatric Cardiology. This course is a clinical clerkship in pediatric cardiology. The purpose of the course is to provide the student with expertise in clinical evaluation of cardiovascular disease in infants, children, and adolescents. It will be particularly useful for students planning a career in pediatrics or cardiology. The student is a full-time, active participant in the pediatric cardiology clinical service team. The clerkship includes exposure to EKG interpretation, echocardiography, and cardiac catheterization, with a particular focus on physical examination skills. Prerequisite: Pediatrics 5020, Medicine 5020. Fourth year. Johns.

PED 5690. Clerkship in Pediatric Endocrinology. Students who participate in this clerkship will be able to identify the common endocrine problems of childhood, propose appropriate diagnostic studies, and formulate long-term management plans. Growth disorders, diabetes, thyroid disease, and adrenal disease will be the most common conditions encountered, including abundant referrals for new-patient evaluations. The clerkship combines patient contact in the hospital and ambulatory setting with ample time for case discussions with faculty. Prerequisite: Pediatrics 5020. Fourth year. Mathew.

PED 5700. Clerkship in Pediatric Hematology-Oncology. Once students have finished this elective, 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 elective 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 elective 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). Prerequisite: Pediatrics 5020. Fourth year. Domm.

PED 5710. Clerkship in Pediatric Gastroenterology, Hepatology, and Nutrition. Students actively participate in the care of pediatric gastroenterology out-patients and in-patients at Vanderbilt Children's Hospital. The rotation provides a broad experience in the evaluation and management of common as well as unusual gastroenterological, hepatic, and nutritional diseases of childhood. Attendance in the endoscopy laboratory permits familiarity with esophagogastroduodenoscopy, colonoscopy, polypectomy, and percutaneous liver biopsy. Rounds include daily review of histopathology specimens and radiographic studies. Custom-designed rotations emphasizing nutritional support or outpatient experience can be arranged. Prerequisite: Pediatrics 5020. Fourth year. Acra.

PED 5720. Clerkship in Pediatric Nephrology. Students actively participate in the evaluation and management of pediatric nephrology patients seen at Monroe Carell Jr. Children's Hospital at Vanderbilt. Through a combination of inpatient and outpatient experiences, the student will increase his/her knowledge of renal physiology and pathophysiology, congenital abnormalities of the kidneys and urinary tract, glomerular diseases, and hypertension. Prerequisite: Pediatric 5020; Medicine 5020. Fourth year. Jabs.

PED 5800. Genetic Clerkship. Students participate in evaluating, diagnosing, and counseling patients and families seen in the genetics, genetics outreach clinics as well as ward consults. Students will gain experience with a variety of single gene disorders, malformation syndromes, and biochemical, chromosomal and molecular abnormalities. They will participate in weekly research and clinical conferences. Selected research projects in clinical genetics, dysmorphology, molecular genetics, or neurogenetics are also available. Prerequisite: faculty approval. Fourth year. Phillips.

PED 5815. Subinternship in Neonatology. Students will serve as clerks on the newborn special care service of VU Hospital. They will have all associated clinical responsibilities and will participate in all the usual house staff activities. This elective requires a 100 percent commitment of the student's time. The student will participate in in-house night call. Prerequisite: faculty approval. Fourth year. Walsh.

PED 5910. Clerkship in Pediatric Infectious Disease. The central objective of the elective clerkship in pediatric infectious diseases is to learn to evaluate children with infectious diseases. Core reading on the pathophysiology of infectious disease will be encouraged. Students will actively participate in ambulatory and hospital care of children with infectious disease. Prerequisite: Pediatrics 5020. Fourth year. Halasa.

PED 5990. Subinternship in Pediatric Critical Care. The elective will be geared towards fourth- year medical students interested in pursuing pediatric residency. The objectives will be (1) understanding of the complex pathophysiology of critically ill children, (2) learning the basic principles of multidisciplinary management of critically ill children, and (3) detailed review of a few common diseases seen in a multidisciplinary pediatric critical care unit. The student will be expected to participate in all the teaching

conferences of the division. Additionally, the student will be expected to stay overnight at least four times during the four weeks' rotation, and will be expected to review topics present in a formal setting. Prerequisite: Pediatrics 5020. Fourth year. G. Fleming.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

PED 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

PED 7100. Special Clinical Study-Non-VU. 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.

Pharmacology

PHAR 5220. Cardiovascular Pharmacology. The goal of this course is to provide the student with a state-of-the-art knowledge of cardiovascular physiology and pharmacology from the molecular to the organismal level. Classic experimental studies, molecular studies, and clinical observations will be presented to demonstrate the power of interdisciplinary approaches in answering complex questions in biology. Students will have the opportunity to identify specific areas of pathophysiologic states for emphasis. Topics covered: development of the cardiovascular system, regulation, coagulation, and select cardiovascular pathophysiologies. Course Offered every alternate odd-numbered year. First and second year. Barnett.

PHAR 6100. Special Clinical Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

PHAR 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

PHAR 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Preventive Medicine

PM 5410. Health Services in the Community. These are introductory sessions on the organization of health services, and orientations to Vanderbilt University Medical Center and Nashville. There will be assignments to community-based services, including visits to patients with a nurse in the Vanderbilt Home Nursing Program. Other community sites include primary care centers and special programs, including Alive Hospice, a service center for homeless persons, and a clinic serving primarily immigrants and refugees. First and second year. Lefkowitz, Heitman.

PM 5720. Clerkship in Epidemiology at the CDC. At the Centers for Disease Control (CDC) in Atlanta, students will be introduced to the principles and practices of epidemiology through participation in the day-today operation of a national disease surveillance system, and by actively assisting in epidemiological investigations. Students often have an opportunity to participate in a field investigation. Insofar as possible, students will be allowed to choose the program area to which they wish to be assigned. Under the general supversion of a senior staff member, the student, in addition to assisting in epidemic investigations, will work in all phases of program activities. The program areas include communicable diseases (salmonella, shigella, tetanus, hospital-acquired infections, hepatitis, neurotropic viruses, etc.), vaccine utilization (measles, rubella, polio, etc.), family planning evalution, leukemia surveillance, etc. Travel and living expenses while in Atlanta, and basic transportation costs between home (medical school) and Atlanta must be borne by students. Combinations of vacation time and elective time may be arranged. NB: Students must submit an application to the CDC. The CDC deadline for applications is March 30 of the third year of medical school for elective periods during Sept-Dec of the student's fourth year; it is May 30 for electives starting after January of the fourth year. Occasionally later applications will be considered, but the general rule is the earlier the application, the more likely your acceptance into the program. Application can be obtained from CDC by visiting the website *www.cdc.gov/eis/applyeis/elective.htm*. Dr. Schaffner is closely associated with the CDC activities and can describe them in detail and facilitate your application. Prerequisite: Enrollment requires faculty approval. Fourth year. Schaffner.

Physiology

PSIO 5300. MSTP Seminar Series. This elective is only open to students in the Medical Scientist Training Program.

PSIO 6100. Special Clinical Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

PSIO 6150. Special Research Study - Physiology. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

PSIO 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

Psychiatry

PSYCH 5020. Psychiatry Core Clerkship. Psychiatry clinical rotation. Basic goals of this clerkship 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 four-week placements include: Vanderbilt University Hospital, VA Hospital, the Psychiatric Hospital at Vanderbilt (Adult/Adolescent/Child) and Middle Tennessee Mental Health Institute. Salomon and staff.

PSYCH 5470. Empathy and the Physician-Patient Relationship. This course addresses the critical issue of communicating with patients. The course builds on students' altruism and desire to care for patients and to establish a good physician-patient relationship. Emphasis is on the student's professional identity and interaction with patients. The course focuses on skills of interpersonal communication with a primary emphasis on developing understanding and skills of empathy. Practical approaches to listening to and talking with patients are practiced in a small group discussion/seminar format. Students also gain an understanding of patients as persons who are integrated biologically, psychologically, spiritually, and socially. The meaning of suffering and illness are examined to explore the multiple facets of illness experience. Some class discussion incorporates assigned readings of brief excerpts from selected articles and books written by patients and physicians. Some classes involve interviews with patients as well as practicing physicians. The objective of this course is to enhance students' feelings of satisfaction, confidence, and competence with patient encounters. First and second year. Owens.

PSYCH 5615. Clerkship in Public Psychiatry. A variety of clinical experiences are available for students in community psychiatry settings. The constant focal points are at the Downtown Clinic with Dr. Stovall and the monthly Shade Tree psychiatry with various Vanderbilt attendings. Time in specialized clinics at the Centerstone outpatient facilities is also arranged, often with special interests of the student as a focus. In each of these settings, students will serve as integral members of the treating team with supervision of care and discussion of notes by the attending. Direct patient care will include evaluating, diagnosing, and treating a wide variety of acutely ill psychiatric patients. Students will gain experience managing an acute psychiatric service as well as gaining exposure to the practice of

psychiatry in the community mental health system. Prerequisite: Psychiatry 5020; Medicine 5020. Fourth year. Stovall.

PSYCH 5617. Clerkship in Alcohol and Drug Dependence. This elective will consist of care of patients undergoing alcohol and drug dependence rehabilitation in the Vanderbilt Addiction Center (VAC) [formerly VITA] unit under the leadership of members of the Division of Addiction Psychiatry. Students will have responsibility for the psychiatric care of patients in regular work and teaching rounds, reviewing rehabilitation plans for the patients and participating in group therapy discussions, attending staff conferences, and developing a comprehensive knowledge of the detoxification and rehabilitation of persons with substance use disorders and their medical and psychiatric complications. They will learn the team concept of care through a multidisciplinary approach employing medical and psychiatric nursing care, social services, group therapy, nutritional assessment, occupational and vocational rehabilitation, and exercise. Emphasis will be on family dynamics, demonstrating the dysfunctional family relationships that occur in chemically dependent patients. The special programs of Alcoholics Anonymous, Al-Anon, and Narcotics Anon groups will be available both on the unit and in the community. The after-care of patients will be demonstrated. The student will have the opportunity to share in clinical responsibility for the care of these often complex patients under the daily supervision of the attending. Prerequisite: Psychiatry 5020. Fourth year. Martin.

PSYCH 5620. Subinternship in Neuropsychiatry. This subinternship 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. Prerequisite: Psychiatry 5020, Neurology 5020, fourth year rotations in both Psychiatry and Neurology. Requires faculty approval. Fourth year-January through April. Gwirtsman.

PSYCH 5625. Subinternship in Child Psychiatry Consultation-Liaison. This subinternship 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 with the faculty if available at that time. Prerequisite: Psychiatry 5020, Neurology 5020, Pediatrics 5020. Fourth year. Sanders.

PSYCH 5635. Clerkship in Emergency Psychiatry. In the Psychiatric Treatment Unit (PTU) 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, observed Beds, OB/GYN triage, and in the PTU. Patients treated will be above the age of 18 years. Prerequisite: Psychiatry 5020. Fourth year. Wilson.

PSYCH 5638. Adult Outpatient Psychiatry. Students will become primarily active contributors to evaluation and treatment clinics in adult outpatient psychiatry under the direct supervision of Dr. Thomas Lavie at the Village at Vanderbilt clinic location. Time is also arranged shadowing clinics with Dr. Salomon (mood and anxiety) and others, participating in

the monthly ShadeTree psychiatric consultation clinic, and in a weekly community (Downtown) psychiatry clinic with Dr. Stovall. Sessions sitting in on psychotherapy with Dr. Linda Manning 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 principels of insight-oriented therapy and CBT). This will also include didactic teaching, case presentations, treatment planning, chart review and group supervision. Prerequisite: Psychiatry 5020. Fourth year. Salomon.

PSYCH 5639. Clerkship in Child and Adolescent Psychiatry. Students will have the opportunity to shadow child psychiatrists in outpatient, inpatient, and school-based consultation settings. Assigned readings supplement patient care experiences. Students are occasionally expected to follow patients with attending/resident supervision. Special projects are optional for students and may include research and writing activities. Prerequisite: Medicine 5020; Surgery 5020; Psychiatry 5020. Fourth year. Freeman.

PSYCH 5645. Subinternship in Adult Consultation-Liaison Psychiatry. The adult consultation team 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 and outpatient settings at Vanderbilt Hospital, Stahlworth Rehabilitation Hospital, and One Hundred Oaks Medical Center. Commonly treated conditions include delirium, dementia, depression, suicide attempts, capacity evaluations, agitation management, altered mental status, conversion disorder, addictions, and somatoform disorders. 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 fellows and attendings. A partial focus on areas of special interest to the student may be arranged. A clinical topic presentation or paper in case report format will be required. Prerequisite: Psychiatry 5020. Fourth year. Wilson.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work at Vanderbilt. Approval required.

PSYCH 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

PSYCH 7100. Special Clinical Study-Non-VU. 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 5610. Clerkship in Diagnostic Radiology. The student participates in a variety of learning experiences in diagnostic radiology. These include reading materials designed for medical students, a didactic lecture series by the radiology staff, round table discussions of appropriate radiographic evaluation of patients, rotations through the various subspecialty divisions of radiology, and various film reading sessions. The purpose of this course is to provide the fourth-year medical student with the fundamentals of diagnostic imaging and an understanding of optimal imaging pathways for various clinical conditions. Attendance and participation are required. This course is not well-suited for the student who needs excessive time off away from the rotation. Prerequisite: Medicine 5020, Surgery 5020, Pediatrics 5020, and Obstetrics/Gynecology 5020. Fourth year. Offered August, September, October, November, February, and April. Donnelly, Jordanov.

RAD 5630. Clerkship in Pediatric Radiology. This program will introduce the fourth-year medical student to the principles of diagnostic imaging in pediatric radiology. The medical student will function primarily as an observer during the interpretation of radiographs and the performance of procedures. S/he will be expected to correlate clinical presentation of the patient with the radiologic imaging studies in order to develop a mature appreciation of the role of pediatric imaging and the practice of clinical pediatrics. Prerequisite: Fourth-year status. This course is offered from September through April only. Heller.

RAD 5640. Clerkship in Neuroradiology. Students will cover both adult and pediatric neuroimaging during their rotation. The month will allow a broad exposure to the field of neuroradiology. Students will primarily cover readouts with Dr. Megan Strother (adult neuroradiology) and Dr. Curt Wushensky (pediatric neuroradiology). Working with the radiology residents, students will review cases prior to readouts, correlating clinical histories with radiographic findings. Students will be responsible for weekly case presentations during the neuroradiology case conferences. Reading assignments will focus on the basics of CT and MR imaging. Prerequisite: Fourth-year status, Strother.

RAD 5650. Clerkship in Interventional Radiology. This clerkship is designed to be an immersion in the daily life of an interventional radiologist with experience in the clinic, on rounds, and in the procedure room. Interventional radiology is a subspecialty that combines cutting edge technology with comprehensive patient care. Acting primarily as a consultant, the radiologist performs a broad spectrum of procedures and covers virtually every patient population and disease process. 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 and venous catheters, and TIPS. Prerequisite: Diagnostic Radiology. Fourth year. Bream.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work at Vanderbilt. Approval required.

RAD 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

RAD 7100. Special Clinical Study-Non-VU. 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.

Radiation Oncology

RADO 5620. Clerkship in Therapeutic Radiology. Students participate in initial evaluation of patients, formulation of treatment, supervision of treatment, and follow-up evaluations. Basic oncology principles to be emphasized. Student will learn indications and techniques for stereotactic, HDR, LDR and IMRT radiotherapy. Prerequisite: Fourth-year status. Chakravarthy.

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 6200. Special Study-Pre-Clinical.** Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

RADO 7100. Special Clinical Study-Non-VU. 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.

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. Clinical 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), Neurosurgery (VUH), Ophthalmology(VUH), Orthopaedic Surgery(VUH), Otolaryngology (VUH), Pediatric Surgery (VUH), Plastic Surgery (VUH), Renal Transplant (VUH), Urology (VUH), Vascular Surgery (VUH), 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. Eskind and staff.

SURG 5030. Clerkship: Remediation Surgery. This course is offered to students who are required to remediate the third year surgery clerkship. The length of the clerkship may vary.

SURG 5460. Plastic Surgery Elective. 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? Are you interested in seeing patients and examining patients who have a broad varieity of clinical problems? Are you interested in interacting with the faculty in a small group to discuss these problems in detail on a weekly basis? If so, I would encourage you to consider the plastic surgery elective as a part of your educational opportunities. Second year. Shack.

SURG 5600. Transplantation Elective. The goal of this course is to introduce second-year students to the biological, clinical, and social aspects of transplantation. The course will meet for thirteen or fourteen one-and-onehalf hour sessions during the fall semester. The weekly format will be discussion of clinical issues in transplant recipients. The preceptors will vary from week to week. The format may also vary depending on the wishes of the preceptors. Slides or other didactic material may be included, but the basic structure will be a seminar with questions to be answered and group discussion. A few faculty may bring transplant patients to the sessions to answer questions and interact with students. For students interested in watching transplant operations, there will be a sign-up sheet posted at the beginning of the course, and it is anticipated that a few students will have this opportunity. After the course is completed, it is anticipated that the students will have a broad understanding of the vocabulary and concepts involved in organ transplantation. They will have a grasp of the basic biological and clinical issues of transplantation and be familiar with the most important social and ethical problems in the discipline. The students should also be aware of the major complications of transplantation. An attempt will be made to include in discussion areas of current investigation in transplantation biology. Prerequisite: First-year curriculum. This course may be cancelled for low enrollment. Second year. Geevarghese.

SURG 5612. Subinternship in Surgery, VAH. Students rotating at the Veterans Administration Hospital can elect to spend time on general surgery, vascular surgery, or cardiothoracic surgery. They 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. There will also be a weekly clinic which the student will be expected to attend. Each service has a full complement of conference activities which the students will be expected to attend. There will be close observation of the student's activities by the house staff and by the attending staff, as well. If students are interested, ample opportunity will be provided to do a brief report for possible publication. Prerequisite: Surgery 5020. Fourth year. Tarpley.

SURG 5614. Subinternship in Surgical Critical Care Medicine, VU. The Surgical Critical Care clerkship 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. 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, two mid-level surgical/anesthesia residents, and three surgical interns. Other staff available in the units include clinical pharmacists, respiratory therapists, and advance practice nurses. Teaching rounds are made each morning with didactic lecture 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 an essay examination given at the end of the rotation. Mid-rotation and final evaluations of each student will be conducted by the critical care fellow assigned to the unit, as well as the course director. Call expectations are one night each week and two weekend nights (total of six night-call shifts) during the rotation. Prerequisite: Surgery 5020. Fourth year. May.

SURG 5615. Subinternship in Vascular Surgery. This course will expose the student to the physical assessment of the vascular patient with correlation of diagnostic testing. Treatment options will be discussed and vascular surgical techniques emphasized. Operation experience as well as conferences, rounds, and clinic participation is expected. Prerequisite: Surgery 5020. Fourth year. Naslund.

SURG 5616. Subinternship in Emergency General Surgery. The EGS service is the primary general surgery service at Vanderbilt University Hospital which handles all emergent and urgent non-trauma surgical emergencies. The service responds to all consults in the Emergency Department, in-patient, and transfers from the surrounding 85,000 square miles. The common disease processes range from "bread and butter" general surgery (appendicitis and cholecystitis) to the abdominal catastrophe. Operative cases are done in the OR with open and laparoscopic techniques. Bedside surgery for critically ill patients is a common occurrence. The EGS service performs most of the ICU PEG's and perc. tracheotomies for the adult ICUs. The medical student extern experience on the EGS service is a concentrated experience on a busy general surgical service. The student will be an integral part of the team. Students will get to see initial surgical consultation, follow patients during their hospital stay, and participate during any operative intervention. The medical student extern is expected to take a minimum of 1:4 on call with the EGS consult resident. This allows the medical student an opportunity to experience what a surgical residency is like. Evaluation will be based on feedback from faculty and the chief resident with whom you have worked. Prerequisite: Surgery 5020, Third-year core clerkships. Fourth year. Diaz.

SURG 5617. Subinternship in Colon and Rectal Surgery. The colon and rectal surgery service at VUMC offers the opportunity for fourth year medical students to serve as subinterns. This affords the students the opportunity to take an active role in patient care while assuming some of the intern responsibilities when appropriate as well as being involved in the operating room. Operative cases range from open and minimally invasive/ laparoscopic colon and rectal procedures for inflammatory bowel disease, diverticular and other benign diseases, and neoplasia to procedures for benign anorectal conditions. Students will work very closely with the three colon and rectal surgery faculty in clinic and in the operating rooms which allows for personal attention and feedback. Requires approval through the Registrar's Office. Prerequisite: Surgery 5020. Fourth year. Muldoon.

SURG 5618. Subinternship in Hepatobiliary Surgery and Liver Transplant. This rotation provides a general exposure to the fundamentals of hepatobiliary surgery and liver transplantation. The student will be expected to see patients and be a part of their care preoperatively, intraoperatively, and postoperatively in the transplant clinics, in the OR, and on ward rounds. The student will participate in transplant operations at VUMC and organ procurements, which may be performed outside of VUMC. Finally, the student will attend all transplant conferences that are held during his or her rotation. Prerequisite: Surgery 5020. Fourth year. Geevarghese.

SURG 5619. Subinternship in Gastrointestinal/Laparoscopic Surgery. The senior 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. Prerequisite: Surgery 5020. Fourth year. Poulose.

SURG 5620. Subinternship in Neurological Surgery. The student works with the resident staff and attending staff on the neurosurgical service at Vanderbilt University participating in the diagnosis and management of patients with neurosurgical problems. Prerequisite: Surgery 5020. Requires faculty pre-approval. Fourth year. Allen.

SURG 5621. Subinternship in Surgical Critical Care, VAH. This general surgery clerkship at the Veterans Administration Hospital 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 an intern. The course content emphasizes a physiologic approach to the care of critically ill general, cardio-vascular, vascular, orthopaedic, urology, ENT, and neurosurgical patients. Students will gain experience with invasive hemodynamic monitoring, mechanical ventilation, enteral / parenteral nutrition, surgical infectious disease, and management of vasoactive medications. The patient care service consists of a surgical or anesthesia attending physician, a critical care fellow, and

a surgical or anesthesia intern. Teaching rounds are made each morning Monday-Friday. The student will be expected to attend the didactic lecture series at 11:00 a.m., along with the other interns and medical students rotating through Vanderbilt SICU and Neuro-ICU. A course syllabus containing educational objectives is provided to all registrants. Evaluation of the student's performance is based on clinical knowledge, basic science application, and integration into the team. There are no call expectations for this rotation. Prerequisite: Surgery 5020. Fourth year. Banerjee.

SURG 5630. Subinternship in Cardiac Surgery. This course consists of an intensive four-week exposure to the patient care activities of the cardiac surgical service. Faculty will consist of members of the Department of Cardiac Surgery. Students will have the opportunity for extensive exposure to patients with a wide variety of clinical problems in acquired/ congenital cardiac disease including coronary atherosclerosis and its intraoperative (coronary bypass) and percutaneous (coronary stent placement) management in the "hybrid OR," repair of cardiac valve disease using the standard and minimally invasive approaches, management of cardiac failure including ventricular assist devices, and cardiac transplantation. By special arrangement, students may rotate on pediatric cardiac surgery for their four-week rotation. The educational environment will be the outpatient clinic, operating room, ICU, and general care wards. Formal teaching conferences and didactic lectures will be provided weekly. Prerequisite: Surgery 5020. Fourth year. Byrne.

SURG 5632. Subinternship in Thoracic Surgery. This course consists of an intensive four-week exposure to the patient care activities of the thoracic surgical service. Faculty will consist of members of the Department of Thoracic Surgery. Students will have the opportunity for extensive exposure to patients with a wide variety of clinical problems including staging and treatment of lung cancer, esophageal cancer, management of advanced thoracic neoplasms including pulmonary metastases and malignant pleural effusion, reoperative thoracic surgery, and management of end-stage lung disease with lung volume reduction surgery and lung transplantation Specific attention to multidisciplinary care in thoracic surgery, clinical trials, and health care outcomes will be provided. The educational environment will be the outpatient clinics, operating room, ICU, and general care wards. Formal teaching conferences and didactic lectures will be provided weekly. Prerequisite: Surgery 5020. Fourth year. Putnam.

SURG 5634. Subinternship in Cardiothoracic Surgery, VAH. The Veterans Administration Hospital fourth-year mission is to provide students with the opportunity to experience a broad spectrum of cardiothoracic patient interactions from the clinic to the OR to the bedside and beyond. Building upon the third year of medical education, the fourth-year student will be incorporated into the surgical team as a subintern and function at the level of an intern. The student will be expected to identify, discuss, and outline therapeutic options for common surgical pathologies from the simple to the complex. The student will attend the thoracic OR on Mondays and clinic on Fridays. Tuesdays, Wednesdays, and Thursdays will be spent covering the cardiac surgery service. The focus will be technical in nature and the student should arrive with basic suturing and knot typing expertise. Over the course of four weeks, the goal will be to inspire a quest for surgical knowledge and technique that will be the impetus for a surgical career. The student will develop an understanding of the processes at work in defining thoracic pathology and the operative techniques employed to surgically correct or remove it. Requires approval through the Registrar's Office. Prerequisite: Surgery 5020. Fourth year. Grogan.

SURG 5640. Subinternship in Urology. The student will work with the full-time faculty and the urology resident staff in the day-to-day care of patients on the urology service. This clerkship will provide an in-depth experience in the care and treatment of a patient population that is commonly seen at a tertiary care hospital. Operative experience will be quite extensive. Participation on this clerkship also involves attendance at the various department-wide conferences held from time to time during the week. This is an intensive and comprehensive clerkship for those considering urological residency or other postgraduate surgical training, or for those seeking an overview of urologic surgery position. Prerequisite: Surgery 5020. Smith.

SURG 5660. Subinternship in Pediatric Surgery. This course provides an opportunity for students to work on the wards and in the outpatient department caring for children in pre-operative, operative, and post-operative periods and attending both pediatric and surgical conferences. Daily rounds are held. Prerequisite: Surgery 5020, Pediatrics 5020. Fourth year. Neblett.

SURG 5670. Subinternship in Surgical Oncology. This general surgery course offers inpatient and outpatient clinical experience in treatment of patients with primary as well as recurrent or inoperable malignant tumors at Vanderbilt University Hospital. Emphasis is on principles of comprehensive management of patients with malignant disease. The student will gain experience in the multimodality treatment approach to cancer. Prerequisite: Surgery 5020. Fourth year. Parikh.

SURG 5680. Subinternship in Plastic Surgery. The student works with the plastic surgery faculty and residents on the plastic surgery service at Vanderbilt University Hospital, 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. Prerequisite: Surgery 5020. Fourth year. Shack.

SURG 5690. Subinternship in Kidney/Pancreas Transplantation. This course is offered by the Department of General Surgery. Students will work with the resident and full-time staff on the transplantation service. Experience will be provided in pre-operative, operative, and post-operative management of patients who have had a kidney and/or pancreas allograft. The student will have an opportunity to study methods of tissue typing, organ preservation, and immunosuppression. Ward rounds daily. Prerequisite: Surgery 5020. Fourth year. Shaffer.

SURG 5700. Clerkship in Oral Surgery. Senior medical students will work with the residents and staff in the diagnosis and management of oral surgical problems. There will be participation in the management of a wide range of surgical problems, including temporomandibular joint disease, facial trauma, growth abnormalities, and benign lesions. There will also be experience in minor surgical procedures of the mouth, for example, extraction of teeth. Prerequisite: Surgery 5020. Fourth year. McKenna.

SURG 5850. Subinternship in Trauma. The Vanderbilt University Trauma Center provides an integrated approach to the multiply injured patient. The student will be introduced to the three basic components of trauma care; pre-hospital care, hospital care, and rehabilitation. The pre-hospital care component includes exposure to the Life Flight program, the Metro Ambulance Service, and the initial resuscitation and assessment in the Emergency Room. The hospital care component of the elective allows active participation on the inpatient trauma service, including the assessment of difficult problems in intensive care medicine and rehabilitation. Students are expected to become proficient in a wide variety of bedside procedures in a supervised setting. An essay examination is given at the end of the rotation. Prerequisite: Surgery 5020. Faculty approval required. Fourth year. Miller.

SURG 5930. Introduction to the Surgical Internship. The goal of this course is to provide fourth year medical students entering general surgery or a surgical specialty with tools to help them succeed in their intern year. This will be accomplished through five primary objectives: (1) identifying and reviewing the top ten common "on call" issues, (2) defining and improving the laparoscopic skills set, (3) defining and improving surgical skills techniques, (4) reviewing and improving anatomical structures associated with general surgery, and (5) improving interpersonal communication skills. These five objectives will be met through a combination of didactic teaching, case-based discussion, simulation, clinical experience, and hands-on technical skills workshops. Prerequisite: Surgery 5020. Open to Vanderbilt medical students only. Fourth year. February. Guillamondegui.

SURG 5980. Subinternship in Pediatric Urology. The student will work with full-time faculty and the urology resident staff in the day-to-day care of patients on the pediatric urology service. This clerkship will provide an in-depth experience in the care and treatment of both in-hospital and outpatient urological problems. Participation in the clerkship will also involve attendance at the various department-wide conferences held during the week. This clerkship is intended for those considering a urological residency or considering a residency in pediatrics. Prerequisite: Surgery 5020. Fourth year. Brock.

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 6150. Special Research Study-Vanderbilt. Each student arranges an independent study with a mentor and completes a period of research work. Approval required.

SURG 6200. Special Study-Pre-Clinical. Each student arranges an independent study with a mentor and completes a period of clinical or research work. Approval required.

SURG 7100. Special Clinical Study-Non-VU. 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] Raj.

MSCI 5001. Grant Writing I. 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] Brown, Ray.

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 M.S.C.I. 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] Byrne.

MSCI 5003. Molecular Medicine. The Molecular Medicine course will provide an overview of basic cellular and molecular processes to acquaint physicians who have been engaged in clinical training with recent advances in these areas. Each module of the course will consist of didactic lectures addressing a fundamental process followed by clinical illustrations to demonstrate the relevance of molecular biology to clinical medicine and investigation. In general, the fundamental didactic lectures will be delivered by basic science faculty and the clinical illustrations will be presented in a case-oriented fashion by a member of the Department of Medicine or other clinical department. First year. Spring. [4] Sawyer.

MSCI 5004. Human Genetics. This course prepares students to (1) describe the structure and function of genes and chromosomes, the distribution of genetic variants in populations, and the role of genetic variants in human disease; (2) describe the implementation of methods for ascertaining clinical datasets for clinical genetic research studies; (3) understand molecular genetic methods for genotyping and variation and mutation detection in the conduct of clinical genetic research studies; (4) identify genetic epidemiological methods for identifying genetic variants associated with complex disease risk; (5) describe thresholds for significance in studies of studies of complex disease genetics; (6) describe use of online databases in clinical genetic research and address ethical concerns in the

design and conduct of clinical genetic research studies; and (8) describe the challenges in translating clinical genetic research into clinical practice. Second year. Fall. [2] Taylor.

MSCI 5005. Case Studies in Clinical Investigation I. First year M.S.C.I. students will present their project plans for class discussions. The format will be in a studio design. Students will be presenting their M.S.C.I. 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. First year. Fall. [1] Ikizler, Barr.

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 M.S.C.I. project to class to stress hands-on learning with clinical research data. First year. Fall. [4] Byrne.

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] Shintani.

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] Orozco.

MSCI 5017. Clinical 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] Brown.

MSCI 5018. Introduction to Cancer Biology. (Also listed as CANB 340) This is a didactic lecture series in which general concepts in cancer biology will be reviewed. Topics range from molecular biology of cancer (oncogene and tumor suppressors) to novel concepts such as cancer stem cells and therapeutic approaches. Prerequisite: IGP core course or consent of instructor. Fall. [2] Yull.

MSCI 5021. Molecular and Cellular Immunology. IAlso listed as M&IM 3282) The cellular and molecular foundations of the immune response system and the humoral and cellular reactions that result from immunologic interactions. Two lectures per week and seminars presented by students. Second year. Fall. [3] Joyce.

MSCI 5022. Advanced Concepts In Cancer Biology. (Also listed as CANB 342) Advanced concepts in cancer biology will be reviewed in depth using a combination of lectures and student-led discussion sessions based on current literature. This course is offered only in tandem with the Introduction to Cancer Biology course to be taken concurrently. Prerequisite: must be a Cancer Biology graduate student or have consent of instructor. Fall. [4] Fingleton.

MSCI 5023. Master's Research. 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.

MSCI 5024. Case Studies in Clinical Investigation II. This course is designed to simulate a thesis defense. Overall, second-year M.S.C.I. students are expected to give a presentation to the class on the progress of

MSCI 5025. Research Extension. This course allows for an extension on the research project.

[1] Ikizler, Barr.

MSCI 5026. Proteomics. This lecture-style course will include the following sample subjects: Introduction to Clinical Proteomics--rationale, description of prior studies and future needs; Selection of candidate biomarkers--application of MALDI Mass Spec to biological samples; Selection of candidate biomarkers--other approaches; Assay development--multiplex assays, high throughput micro assays, industry collaboration; Sample datasets--how clinical proteomics can be incorporated into past and future clinical trial datasets and IRB issues; Biostatistical Analytical approaches for proteomics; Novel Bioinformatic approaches to proteomic data analysis; Clinical Proteomics in action--application of the process to clinical acute lung injury. Spring. [1] Ware.

MSCI 5027. Functional Genomics And Proteomics: Applications To Immunobiology. (Also listed as M&IM 351) Biological applications of functional genomics and proteomics in immunology. Topics include: 1) proteomic analysis of blood cells, vascular endothelial cells, and smooth muscle cells involved in immunity and inflammation, 2) functional genomics of immunobiology using genome-wide mutagenesis, 3) gene expression profiling of immune/inflammatory responses based on DNA microarray technology, 4) peptide/protein transduction and its applications to cell-based proteomics and intracellular protein therapy, 5) proteomic analysis of MHC antigens, 6) genomics and proteomic analysis of immunological diseases, and 8) development and application of new genomic and proteomic strategies in immunology. Spring. [2] Link, Hawiger, Staff.

MSCI 5028. Data Management. The objective of this elective course is to teach students the fundamentals of research data planning, collection, storage, dissemination and manipulatoin. Several software tools will be employed, but primary ideas should transcend individual applications(especially versions) and ultimately serve students by providing tools for use in data management for clinical investigation. Spring. [2] Harris.

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] Heitman.

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] Shintani, Moons.

MSCI 5032. Critical Issues In Cancer Biology. (Also listed as M&IM 377) This seminar/tutorial will examine primary research papers to develop critical thinking skills on current topics in cancer research, including: cell growth control, signal transduction, regulation of gene expression, programmed cell death. The discussions will focus on discredited and controversial areas as well as cutting edge studies. Students can write a paper for additional credit. This course is offered to graduate students only. Post doctoral fellows may audit if space permits by permission of the instructor. Prerequisite: IGP 300a, 300b, and 301, or equivalent. Summer. [2-3] Ruley.

MSCI 5035. Human Genetic Epidemiology. (Also listed as HGEN 390) This course will cover in detail the study design and methods of modern genetic epidemiology. This will include concepts of familial aggregation, linkage analyses, population genetics as it is applied to studies of human traits, and association studies, both candidate genes and genome-wide association. The concept of linkage disequilibrium and its use in disease-gene studies will be extensively discussed. The underlying principles of each approach will be developed and current methods and software programs used to perform these will be discussed. Emphasis will be placed on the advantages and disadvantages of each approach and how to best

design a genetic epidemiology study. Prerequisite: MSCI 5004 and permission from the instructor. Spring. [3] Williams, Crawford.

MSCI 5036. Human Genetics II. (Also listed as HGEN 341) This course will cover the statistical, population, and analytical aspects of modern human genetics research. Topics to be covered include human population genetics, quantitative genetics, disease gene discovery (emphasizing design, statistical and molecular techniques), linkage and association analyses, computational genetics, and evolutionary genetics. Clinical examples, subject ascertainment, and study design will also be emphasized. Students must have a strong understanding of Mendelian genetics and basic biostatistics. Prerequisite: consent of instructor. Spring. [3] Haines and Staff.

MSCI 5037. Tutorial in Statistical and Population Genetics. (Also listed as HGEN 371) The class meets once weekly. Graduate students critically evaluate research publications in areas statistical methods in human genetic analysis and in the area of human population genetics. Also, there are faculty presentations on ancillary science skills, such as oral and poster presentations, and grant and proposal writing. Fall. [1] Crawford, Li.

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.

MSCI 5048. Epidemiology II. The design of observational studies, including factors that are important in design selection. The design of cohort studies, including rationale for use of the cohort study, 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, including rationale for use, conditions necessary for validity of the case-control study, selection of controls, sources of bias in case-control studies, and multivariate analysis. The ecological study, including when to use and when to avoid. Designs to usually avoid: cross-sectional, case-series and exposed-subject designs. The course includes didactic lectures and critical reading of important epidemiologic studies from the current medical literature. The latter encompasses discussion of the articles in small groups and structured presentation to the class. The course also includes a project, which is the development and presentation of a study design protocol to the class. This protocol is for the project that will serve as the student's master's thesis. Prerequisite: Epidemiology 1, Biostatistics 2, Clinical Trials, or approval of instructor. Spring. [4]

MSCI 5099. Independent Study. Students may choose a topic for independent study. [0-5]

Global Health

Courses leading to the Global Health Certificate

VIGH 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 and is offered to MD students as IGHM 5240. Spring. [3] Etherington, Heimberger.

VIGH 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 and is offered to MD students as IGHM 5242. Spring. [1] Manders.

VIGH 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 and for MD students as IGHM 5244. Spring. [1] Heitman.

VIGH 5246. Leadership Development in Global Health. This course is an introduction to leadership theory and practice, directed toward those who seek leadership positions in the area of global health. The course will draw on students' own experiences with leadership and seek to extend their capacities to effectively lead in organizations. The course seeks to explore dimensions and competencies of leaders, define the abilities and traits of effective leadership and explore how students develop those requisite abilities. This course may be taken as credit toward the Global Health Certificate and is offered to MD students as IGHM 5246. Fall. [1] Heuser.

VIGH 5248. Medical Anthropology. This course provides a framework for students to investigate and learn about the study of pain, illness, suffering, and healing in cultures around the world. This course is designed to introduce students to a broad range of medical anthropology topics, theoretical approaches and research techniques by examining case studies on chronic illness, sorcery and traditional healing, modern pandemics, as well as treatment and illness expectations. Within these discussions, our focus will be comparative, investigating illness, misfortune, and healing in a number of societies from Mozambique, Uganda, South Africa, France, the United States, and Japan. Students will develop an appreciation for the culturally specific nature of illness, allowing them to better understand and treat patients from diverse cultural backgrounds. This course may be taken as credit toward the Global Health Certificate and is offered to MD students as IGHM 5248. Spring. [1] Audet.

VIGH 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 and is offered to MD students as IGHM 5249. Spring. [1] Wester.

VIGH 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. This course may be taken as credit toward the Global Health Certificate and is offered to MD students as IGHM 5250. Spring. [1] Dyer.

VIGH 5252. Quality Improvement in Global Health. This course will introduce the concept and methodology of Quality Improvement (QI) science as it applies to health care delivery in the U.S. and in the developing world. The course is designed to give students the background to understand the role that QI plays in reducing medical errors, improving service

efficiency and adding value in health care systems. Students will be given hands-on experience in QI by developing and implementing a personal improvement project over the course of the month. Students will develop an understanding of how to bring about change in health care systems by analysis of health care processes, how to develop pilot interventions, use data to evaluate changes, and empower individuals to be agents of improvement. This course may be taken to satisfy requirements for the Global Health Certificate. First and second year. Ciampa.

Audiology

Courses leading to the Doctor of Audiology

AUD 5121. General Anatomy. Introduction to the structure and function of the human organism. Integrates the gross anatomical structure of the human body and its organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Emphasis also on the clinical relevance of selected topics. Fall. [3] TBA.

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] Hackett.

AUD 5233. Neuroscience. (Also listed as NSC 201.) 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 5302. Hearing Science. A discussion of basic acoustics as it applies to hearing science. Anatomy and physiology of the peripheral and central hearing mechanism and vestibular system. Fall. [3] Hackett.

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. Fall. [3] Hood.

AUD 5310. Measurement of Hearing. (Also listed as HRSP 310) 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. [3] Dickinson/Bradham.

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] Tharpe.

AUD 5325. Pediatric Audiology. (Also listed as HRSP 325) 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] Tharpe.

AUD 5327. Hearing Loss and Speech Understanding. (Also listed as HRSP 327) This course examines various factors that may affect the speech understanding of persons with hearing loss. The contribution to the unaided and aided speech understanding of persons with hearing loss of (1) subject factors, such as degree of hearing loss, and deficits in frequency and temporal resolution, and (2) environmental factors, such as the level and type of background noise, reverberation, and talker characteristics, will be examined. Methods for predicting speech understanding will also be discussed. Spring. [3] Hornsby.

AUD 5328. Psychoacoustics. (Also listed as HRSP 328) Psychoacoustic theory and methods. Auditory perception in normal hearing and hearing impaired subjects. Spring. [3] Hornsby.

AUD 5329. Education and Psychology of Exceptional Learners. (Students are able to enroll in this course as SPED 3000.) Presents an overview of people who are labeled "exceptional" and the implications for education related to them. Examines the disabilities that people have and services, systems, and concepts associated with them. Includes legal, sociological, educational, political, general system theory perspectives and psychological perspectives. State and Federal law relating to education from infancy to adulthood will be related to intervention, ethics, and issues. Discuss trends and issues related to the areas of exceptionality and relate these to previous trends, issues, and attitudes. Fall. [3]

AUD 5330. Advanced Audiologic Evaluation I. Diagnostic audiometry principles and procedures, including acoustic reflex measures, speech audiometry, auditory brainstem response (ABR), and electrocochleography (ECochG). Also, newborn auditory screening with ABR. Practicum required. Spring. [3] Jacobson.

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] Hood.

AUD 5333. Microbiology and Pharmacology for Audiology. An examination of the microbial etiology and pathogenesis of acute otitis media and those microbial/host/environmental risk factors associated with infection, the primary mechanisms of antimicrobial resistance commonly encountered in middle ear infections, and how this process impacts upon the therapeutic selection of an antimicrobial agent. The course will identify the potential role of biofilm formation in the middle ear as a potent virulence factor for recurrent disease. Spring. [3] Edmiston.

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, so-nomotor responses, 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] Jacobson/McCaslin.

AUD 5339. Advanced Issues in Family Intervention. (Students are able to register for this course through SPED 3030.) Provides information on issues and practices related to families with children who have special needs. Emphasis on taking a family systems perspective and a family centered approach to intervention. Provides strategies for effective communication for the purpose of information sharing and collaborative planning with families. Topics include definition and history of the family, family and professional relationships, professional ethics, models of working with families, service coordination, family assessment and the IFSP, promoting family participation in the IEP, and Public Laws 94-142 and 99-457. Fall. [3]

AUD 5340. Amplification I. (Also listed as HRSP 340) Background and development of the design of hearing aids, ear mold acoustics, electro-acoustic, characteristics, performance standards and measurement techniques, clinical selection, and evaluation procedures. Fall [1], Spring [2]. Dickinson.

AUD 5343. Hearing Conservation. (Also listed as HRSP 343) A discussion of noise levels, OSHA guidelines, noise-induced hearing loss, and hearing protection in work and leisure activities. Industrial audiology including testing, training, and intervention protocols. Summer. [2] Staff.

AUD 5345. Amplification II. (Also listed as HRSP 345) Advanced topics in amplification including advanced probe microphone techniques, single and multi-channel compression systems, analog and digital signal processing, and current and emerging prescriptive and fitting verification methods. Fall. [3] Ricketts. **AUD 5346. Assessment of Vestibular Disorders.** (Also listed as HRSP 346) This course offers an in-depth approach to the assessment of the dizzy patient. Subject matter will include anatomy and physiology of the peripheral and central vestibular, ocular motor, and postural control systems; introduction to both electrical and video techniques for recording the vestibulocular reflex; case history and bedside assessment of the dizzy patient, technique and interpretation of electronystagmography, rotational testing, computerized dynamic posturography and sonomotor responses; assessment of self-report dizziness handicap. Students will be expected to conduct practica outside the classroom. Fall. [3] Jacobson, McCaslin.

AUD 5347. Management of Vestibular Disorders. This course will focus on interpretation and analysis of balance laboratory results in dizzy patients as well as treatment and therapy provided by other professionals. Subject matter will include advanced concepts in central vestibular system physiology, peripheral and central disorders of the vestibular system and their clinical findings, introduction to imaging dizzy patients, disequilibrium of aging and risk of falls assessment, drug treatment of vertigo, surgical treatment of vertigo, and vestibular rehabilitation. Summer. [3] Jacobson, McCaslin.

AUD 5348. Audiology in Education. Current issues and trends concerning the role of the audiologist in the public school setting. Emphasis on early identification and intervention, inservice education, amplification, and the roles of federal, state, and local agencies in providing services to the hearing-impaired school-age population. Fall. [3] Fino-Szumski.

AUD 5349. Laboratory: Audiology in Education. Demonstration and hands-on experience with personal and classroom amplification systems. Operation and troubleshooting of amplification systems commonly used in a classroom setting; specifically, hearing aids, FM systems, assistive listening devices, vibrotactile devices, and cochlear implants will be demonstrated. Co- or prerequisite: AUD 5348. Spring. [1] Fino-Szumski.

AUD 5350. Management Procedures for Academic and Social Behavior. (Students are able to register for this course as SPED 3210.) Application of behavioral principles in educational settings. Presents definition and measurement of behavior, reinforcement strategies, systematic program development, basic formats for classroom instruction, and techniques for monitoring student progress. Emphasizes procedures for increasing academic and socially appropriate behavior through simulations and practice exercises. Review of research methodologies and the critical analysis of research literature in the area of applied behavior analysis are required. Students apply their skills in classroom settings. Fall. [3]

AUD 5353. Amplification III. (Also listed as HRSP 353) Design and evaluation of auditory prostheses for listeners with hearing loss. Theoretical and clinical considerations of cochlear and auditory brainstem implants as well as hearing aids from a prostheses perspective. Spring. [3] Ricketts.

AUD 5354. Cochlear Implants for Infants and Children. Current issues in the medical, audiological, speech/language, and educational management of children with cochlear implants. Emphasis on multidisciplinary team function. Prerequisite: AUD 5318. Spring. [2-3] Ricketts.

AUD 5355. Clinical Externship. Fall, Spring, Summer. [0-3] Hale.

AUD 5359. Audiometric Instrumentation and Calibration. (Also listed as HRSP 359) An introduction to fundamental concepts in electronics and computer science and to instrumentation used in the hearing clinic or research laboratory for producing, measuring, and analyzing audio signals. Standards and procedures for calibration measurements, with practical hands-on experience. Fall [3] Grantham, Ricketts.

AUD 5360. Research Methods in Special Education. (Students should register for this course as SPED 3230.) Students will learn the purposes, procedures, and processes of conducting research on educational and psychological issues of exceptional children and educational programs. Includes the study of terminology and research methods (both quantitative and qualitative) and "hands on" application of methods in small-scale pilot studies within the classroom. Some study of statistical procedures is included, but the practical methods and simple computer analyses are emphasized over formulas and mathematical calculations. [3]

AUD 5361. Family-Centered Counseling and Interviewing. (Also listed as SLP 5361) Examines the helping relationship in the clinical process,

counseling theory relative to audiology and speech-language pathology practices, and principles and methods of effective clinical interviewing and counseling. Summer. [2] Hale.

AUD 5362. Foundations of Early Childhood Special Education. (Students are able to register for this course as SPED 3400.) Provides the historical, legal, and theoretical foundations of early intervention/early childhood special education for infants, toddlers, and preschoolers with disabilities. Includes recommended practices related to assessment and instruction for early childhood classes. Discusses typical and atypical development, assessment to identify goals and outcomes, and strategies for promoting development. Fall. [3]

AUD 5363. Hearing and Aging. (Also listed as HRSP 363) 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] Rosenfeld.

AUD 5364. Recommended Practices in Early Elementary Grades for Children with Disabilities. (Students are able to register for this course as SPED 3420) Provides information on typical and atypical development of early elementary children with disabilities. Includes discussions of the general education curriculum (literacy, mathematics, social studies, and science) and recommended practices in adapting that curriculum for children with disabilities. 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] Fino-Szumski.

AUD 5366. Speech and Language for Exceptional Learners. (Students are able to register for this course as SPED 3600.) An overview of normal language development, psycholinguistic theory, and research. Emphasis is on specific intervention procedures useful for teachers of children and youth with severe/profound or mild/moderate disabling conditions. 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] Bess.

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] Ashmead.

AUD 5371. Research Design and Statistics. (Also listed as HRSP 371a and HRSP 371b) Covers topics in research design and statistics for students preparing for research careers in hearing science, speech science, and communication disorders. Reviews mathematical bases for probability theory and statistical inference. Covers fundamental parametric and nonparametric statistical tests, with extensive discussion of research design in the context of analysis of variance. Presents statistical properties of psychophysical methods and signal detection theory. Fall, Spring. [3] Ashmead.

AUD 5374. Advanced Issues and Procedures in the Assessment of Students with Mild/Moderate Disabilities. (Students are able to register for this course as SPED 3820.) This course focuses on the diagnosis and evaluation of students with mild/moderate disabilities using a variety of developmentally appropriate curriculum based assessments, criterionreferenced, and norm-referenced tests in the academic and vocational subject areas. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives and instructional programming strategies. Specific consideration is given to the reporting of assessment information to parents, teachers and other support personnel to determine appropriate placement levels within the continuum of services. Practical application is required. Spring. [3]

AUD 5385. Instrumentation for Hearing and Speech Sciences. (Also listed as HRSP 385) A hands-on introduction to the principles and techniques of setting up equipment for hearing and speech perception experiments. Students are exposed to analog generators (noise generators, function generators, oscillators, computer-controlled digital-to-analog converters), processing devices (attenuators, filters, mixers, amplifiers), terminating devices (earphones, loudspeakers, analog-to-digital converters), and measurement devices (oscilloscope, voltmeter, spectrum analyzer). Students will learn to design and implement circuits involving these various devices, and to measure and calibrate various kinds of acoustic stimuli. Fall of odd-numbered years. [3] Grantham.

AUD 5386. Instrumentation for Hearing and Speech Sciences: MATLAB. (Also listed as HRSP 386) An introduction to the standard MAT-LAB computing language in a Windows environment. Basic programming concepts including data types and storage, data input and output, conditional execution, iterative programming, and the use of functions. The goal is for the student to become sufficiently comfortable with MATLAB (and with the concept of programming languages in general) to develop programs to solve specific computational problems too tedious to solve by calculator. The last third of the course will be devoted to the application of MATLAB programming to real-time laboratory problems. Spring of even-numbered years. [3] Grantham.

AUD 5389. Independent Study Audiology. Independent Study and Readings in Audiology. Fall, Spring, Summer [1-3]

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] Ricketts.

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] Staff.

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. [3] Staff.

AUD 5583. Clinical Case Conference/Grand Rounds. This course includes attendance at weekly case conferences where clinical case studies will be presented. The grade for this class will include clinical performance and attendance. Fall, Spring, Summer. [1] Hale

AUD 5584. Capstone Research. Spring. [0] Varies.

Education of the Deaf

Courses leading to the Master of Education of the Deaf

MDE 5308. Language and Literacy in Children with Hearing Loss. (Also listed as HRSP 308) 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. Corequisite: MDE 5309. Summer. [3] Hayes.

MDE 5309. Practicum: Language and Literacy in Children with Hearing Loss. This practicum provides opportunities for students to incorporate information acquired from MDE 5308 into daily practice to acquire teaching skills and techniques upon which effective learning depends. Corequisite: MDE 5308. Summer. [1] Hayes.

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] Hayes.

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. [2] Bradham.

MDE 5322. Children with Hearing Loss and 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] Hayes.

MDE 5356. Internship/Externship: **MDE/Specialty Track.** A threeweek, 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. Spring. [2] Kan.

MDE 5358. Deaf Educ. Student Teaching/Field Experience. 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, Summer. [1] Kan.

MDE 5360. Research Methods in Special Education. (Students are able to register for this course as SPED 3230.) Students will learn the purposes, procedures, and processes of conducting research on educational and psychological issues of exceptional children and educational programs. Includes the study of terminology and research methods (both quantitative and qualitative) and "hands on" application of methods in small-scale pilot studies within the classroom. Some study of statistical procedures is included, but the practical methods and simple computer analyses are emphasized over formulas and mathematical calculations. Spring. [3]

MDE 5366. Speech and Language for Exceptional Learners. (Students are able to register for this course as SPED 3600.) An overview of normal language development, psycholinguistic theory, and research. Emphasis is on specific intervention procedures useful for teachers of children and youth with severe/profound or mild/moderate disabling conditions. Spring. [3]

MDE 5370. Special Problems in Deaf Education. Areas and problems not included in other courses in deaf education, chosen to fit the students' interests and the needs of their programs. May be repeated to a total of 12 hours. Fall, Spring, Summer. [1-4] Staff.

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. [1] Hayes.

MDE 5374. Advanced Issues and Procedures in Assessment/Students with Mild/Moderate Disabilities. (Students are able to register for this course as SPED 3820.) This course focuses on the diagnosis and evaluation of students with mild/moderate disabilities using a variety of developmentally appropriate curriculum based assessments, criterion-referenced, and norm-referenced tests in the academic and vocational subject areas. Emphasis is on the interpretation of information from assessments into Individualized Education Program annual goals and objectives and instructional programming strategies. Specific consideration is given to the reporting of assessment information to parents, teachers and other support personnel to determine appropriate placement levels within the continuum of services. Practical application is required. 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] Staff.

MDE 5392. Teaching Children with Hearing Loss to Listen and Speak. Theories of and methods for developing auditory perception and spoken language skills in deaf and hard-of-hearing children. The purpose of this course is to increase students' skills in assessing and developing speech, auditory functioning, and phonologic awareness in deaf and hard-of-hearing children. In the fall, the focus will be early childhood development. The spring semester will focus on assessment in early childhood and the summer semester will focus on intervention. Fall [2], Spring [2], Summer [1] Hayes.

MDE 5584. Independent Practicum. Independent Practicum. Fall, Spring, Summer. [0]

MDE 5585. Independent Study and Readings in Deaf Education. 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. (Also listed as HRSP 206) The basic processes of speech production, acoustics, and perception. Neuroanatomy, anatomy, physiology, acoustics, and acoustic correlates of sound features. Intended for undergraduates and graduate students outside the Department of Hearing and Speech Sciences. Spring. [3] Ohde.

SLP 5300. Neurology of Speech and Language. (Also listed as HRSP 300) The structure and function of the nervous system, with emphasis on the neural mechanisms of speech and language. Neurologic conditions producing speech and language disorders are surveyed. Fall. [3] Webb.

SLP 5301. Acoustics and Perception of Speech and Speech Disorders. (Also listed as HRSP 301) An examination of the processes of speech production, acoustics, and perception. Emphasis on relevant literature and research techniques in speech science. Fall. [3] Ohde.

SLP 5304. Child Language Acquisition. The components and processes of normal language development. Relation to social and cognitive aspects of child development. Survey of developmental psycholinguistic research. Fall. [2] Schuele.

SLP 5305. Clinical Principles and Procedures. (Also listed as HRSP 305) Presentation and demonstration of clinical principles and procedures applicable in communication sciences and disorders. Fall. [2] Golper.

SLP 5306. Child Language Disorders. (Also listed as HRSP 306) The language development of children of variant populations. Focus on description of populations, assessment techniques, and intervention strategies. Clinical applications of research in normal language acquisition. Fall. [3] Schuele.

SLP 5307. Seminar: Topics in Childhood Language Disorders. (Also listed as HRSP 307.) Current issues in normal language acquisition and clinical applications to variant populations. Content of seminar rotated. Fall. [2] Staff.

SLP 5311. Stuttering. (Also listed as HRSP 311) Significant research in the field of stuttering, with emphasis on etiology and therapy. The management of fluency disturbances. Spring. [3] Conture.

SLP 5313. Management of Communication Disorders in the Schools. This course provides an overview of management principles and practices for children with communication disorders during the school-age years. Curriculum-based communication assessment and methodologies for implementation of communication programs in school settings will be addressed. Spring. [3] Hausman.

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] Ohde.

SLP 5316. Motor Speech Disorders. (Also listed as HRSP 316) 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] Schneider.

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. [3] de Riesthal.

SLP 5319. Dysphagia. (Also listed as HRSP 319) The study of the normal and disordered swallow in pediatric and adult populations. Anatomy and physiology, videofluoroscopic and other assessment procedures, as well as various treatment alternatives and techniques are included. Fall. [3] Ashford.

SLP 5321. Seminar: Intervention for Pediatric Acquired Brain Injury. Assessment and intervention techniques for cognitive/communicative and behavioral deficits associated with pediatric acquired brain injuries. Emphasis on effects on normal development, educational curricula modifications and teacher/family training. Prerequisite: permission of instructor. Summer. [2] Allen.

SLP 5323. Communication in Autism Spectrum Disorders. (Also listed as HSRP 323) 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. [2-3] Wallace.

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. [2] Ashford, Golper.

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] Henry, Muckala.

SLP 5331. Aphasia. The study of aphasia in adults, including the neuronanatomical basis, etiologies, symptomatology, assessment, differential diagnosis, and treatment. Spring. [3] de Riesthal.

SLP 5335. Seminar in Augmentative Communication. (Also listed as HRSP 335) The application of augmentative communication devices to patients with physical and/or cognitive disabilities. The various types of devices available, the techniques for selecting and applying these systems to individual patients, and specific information on how to achieve effective conversational use of such systems. Fall. [2] Gutmann.

SLP 5336. Voice Disorders. (Also listed as HRSP 336) Theories of voice production, with emphasis upon underlying mechanisms that cause vocal defects. Procedures for group and individual management. Summer. [3] B. Jacobson.

SLP 5338. Research Methods in Communicative Disorders. (Also listed as HRSP 338) Research techniques and procedures. Analysis of research examples from the literature. Study of design of experiment, data collection, statistical analysis, and presentation of research findings. Fall. [1] Camarata.

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. [1-7] Hale.

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] Hale.

SLP 5361. Family-Centered Counseling and Interviewing. (Also listed as AUD 5361) Examines the helping relationship in the clinical process, counseling theory relative to audiology and speech-language pathology practices, and principles and methods of effective clinical interviewing and counseling. Spring. [2] Hale

SLP 5369. Master's Thesis Research. Master's Thesis Research. [0] Varies.

SLP 5388. Independent Study/Readings in Speech Pathology. Independent Study/Readings in Speech Pathology. Fall, Spring, Summer [1-3]. Varies.

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] Hale.

SLP 5584. Independent Practicum. Fall, Spring, Summer. [0] Conture.

Laboratory Investigation

Courses leading to the Master of Laboratory Investigation

MLI 1010. Lab Theory I. 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] Mernaugh.

MLI 1011. Lab Theory II. 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] Mernaugh.

MLI 1021. Bioregulation I: Cell Biology. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. Fall. [2] Chalkley.

MLI 1022. Bioregulation I: Genetics. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. Fall. [2] Chalkley.

MLI 1023. Bioregulation I: Gene Expression. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. FALL. [3] Chalkley.

MLI 1024. Bioregulation I: Proteins. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. Fall. [2] Chalkley.

MLI 1025. Bioregulation I: Macromolecular Structure and Function. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. Fall. [2] Chalkley.

MLI 1026. Bioregulation I: Signaling. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. Fall. [1] Chalkley.

MLI 1027. Bioregulation I: Cell Division and Chromosome Dynamics. Fundamental aspects of the utilization of genetic material from DNA to RNA to protein. Fall. [1] Chalkley.

MLI 1030. Methods of Research Techniques. This course is designed for M.L.I. students. Fall. [1] Chalkley.

MLI 1040. Responsible Conduct in Research. Formal lectures and small group discussion on a range of issues encountered in research activities. Included are responsibilities of the investigator and the university to the federal government; scientific misconduct; ethical use of animals in research; ethics of publication, lab management, and grant writing. Summer. [1] Chalkley.

MLI 1050. Bioregulation II: Neuroscience. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Spring. [1] Chalkley.

MLI 1051. Bioregulation II: Cell Division. Fundamental aspects of cellcell communication and information flow through multicellular organs and the overall regulation of these processes. Spring. [2] Chalkley.

MLI 1052. Bioregulation II: Cell Signaling. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Spring. [2] Chalkley.

MLI 1053. Bioregulation II: Defense Mechanisms. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Spring. [1] Chalkley.

MLI 1054. Bioregulation II: Microbial Pathology. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Spring. [1] Chalkley.

MLI 1055. Bioregulation II: Endocrinology. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Spring. [1] Chalkley.

MLI 1056. Bioregulations II: Cell Pathology. Fundamental aspects of cell-cell communication and information flow through multicellular organs and the overall regulation of these processes. Spring [1] Chalkley.

ML1 2000. Fundamentals of Biomedical Research. (Also listed as Biological Sciences 299) Overview of basic principles of biomedical research. Course will cover the fundamentals of biochemistry, cell biology, and genetics, the three main components of the fall semester Bioregulation course. Summer. [3-6] Chalkley.

MLI 2010. Lab Management. This course is designed for M.L.I. students and covers university, departmental, and laboratory organization, team building, budget management, problem resolution, record keeping, notebook and electronic data base management, IACUC and IRB protocol writing, etc. Spring. [1-4] Richmond.

MLI 2200. Biochemistry I. (Also listed as Biological Sciences 220) Structure and mechanism of action of biological molecules, proteins, nucleic acids, lipids, polysaccharides. Enzymology. Carbohydrate metabolism. Prerequisite: Biological Sciences 110a-110b and Chemistry 220a-220b. Fall. [3]. Krezel.

MLI 2325. Histology with Lab. (Also listed as Cell and Developmental Biology 325) This course focuses on the organization of cells to form tissues and organs in terms of both structure and function. Our studies begin with a discussion of the basic tissue types that form all multicellular organisms. Lecture and microscopic laboratory formats will introduce students to epithelia, connective tissue, muscle, nerve, and lymphoid tissues. Students will examine histological preparations microscopically in laboratory during this phase of the course. Next, a discussion of the organization of tissues into functioning organs will be pursued. Here, we will focus on basic concepts in organ arrangement rather than memorizing various structures. Students will have significant input on which adult or developing organs are used as models of organ structure and function. Learning laboratory methods in the analysis of tissues and organs will run concurrently with didactic instruction. Students will be asked to choose specific tissues/organs (often directly related to their thesis work) that they will prepare for morphological analysis. Specifically, students will learn methods in fixation, processing, sectioning, and microscopic analysis including

morphometrics, immunofluorescence, histochemistry, and electron microscopy. Offered every other year. Fall. [3] Bader.

MLI 2380. Computational Structural Biochemistry. (Also listed as Chemistry 238) Theoretical and practical aspects of modeling protein structure and interactions computationally. Sequence-sequence alignments, secondary structure prediction, fold recognition, de novo structure prediction. Protein design, protein-protein docking, protein-ligand docking. Prerequisite: Chemistry 231. Fall. [4] Meiler.

MLI 2700. Statistical Methods for Biomedical Research. (Also listed as Biological Sciences 270) An introduction to statistical methods used in the analysis of biological experiments, including the application of computer software packages. Emphasis on testing of hypotheses and experimental design. Topics include descriptive statistics, analysis of variance, regression, correlation, contingency analysis, and the testing of methods for sampling natural populations. Prerequisite: Biological Sciences 110a-110b. Fall. [3] McCauley.

MLI 2740. Proteins. (Also listed as Biological Sciences 274) Molecular structures and biological functions of proteins. Underlying chemical and physical properties. Structural motifs and topology; folding and dynamics; enzyme atalysis; protein-DNA interactions. Structure-based drug design; protein symmetry; supramolecular protein machines. Chemical and spectroscopic methods to probe protein structure and behavior in solution. Prerequisite: Biological Sciences 220. Fall. [3] Eichman.

MLI 3010. Thesis Research and Defense. Fall, Spring, Summer. [0-6]. Varies.

MLI 3020. Research Project. Fall, Spring, Summer. [1-6]. Varies.

MLI 3031. Training and Technique Modules: Microscopy. 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. [3] Wells.

MLI 3032. Training and Technique Modules: RT-PCR. 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. [1-3] Opalenik.

MLI 3033. Training and Technique Modules: Microarray. 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, Summer. [3] Levy.

MLI 3034. Training and Technique Modules: Electron Microscopy. 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. [2] Jerome.

MLI 3035. Training and Technique Modules: Animal Surgery. Eightweek modules conducting laboratory research on a project designed by a faculty preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review. Fall, Spring, Summer. [1-3] Wasserman.

MLI 3036. Training and Technique Modules: Mass Spectroscopy. 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 relevant to the use of mass spectrometry for the characterization of proteins, lipids, small molecules, etc. Fall, Spring ,Summer. [1-3] Reyzer.

MLI 3037. Training and Technique Modules: Transgenic Mice. Eightweek modules conducting laboratory research on a project designed by a faculty preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review relevant to the production of transgenic mice. Fall, Spring, Summer. [3] Emeson.

MLI 3038. Training and Technique Modules: Sequenom. Eight-week modules conducting laboratory research on a project designed by a faculty preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review. Fall, Spring, Summer. [2] Schnetz-Boutand.

MLI 3039. Training and Technique Modules: Animal Anesthesiology. Eight-week modules conducting laboratory research on a project designed by a faculty preceptor. Includes technical instruction, critical data analysis, experimental design, and literature review. Fall, Spring, Summer. [2] Williams.

MLI 3040. Training and Technique Modules: Fluorescence Activated Cell Sorting. 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 Eisteinian 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. [2] Weller.

MLI 3100. Cell Biology. (Also listed as Cell and Developmental Biology 310) This is a graduate-level course with three major goals pivotal for success as a graduate student: (1) to provide solid foundational knowledge of cell biology, (2) to learn to think critically about experimental design and interpretation, and (3) to learn to communicate effectively, both orally and in writing. The class features faculty from the Department of Cell and Developmental Biology and emphasizes fundamental cell processes such as migration, mitosis, proliferation, and death. Critical signaling pathways are reviewed in relation to cell biological processes essential for developmental biology. Weekly student presentations help develop oral communication skills and weekly writing assignments hone writing skills, helping students learn classical and cutting-edge techniques while improving their ability to read and synthesize the literature. Final paper assignment is designed to help students learn to develop and design feasible experiments to test a strong hypothesis. Prerequisite: IGP curriculum, the entire Bioregulation class. Fall. [4] Labosky.

MLI 3105. Advanced General Psychology. (Also listed as Psychology 301a) Physiological psychology, perception and sensation, learning, complex processes, developmental, personality, social psychology, and psychopathology. Participation in various sections determined by each student's background and career interests. [3] Staff.

MLI 3107. Introduction to Structural Biology. (Also listed as Biochemistry 300) Introduction to methods to determine the three-dimensional structures of biological macromolecules and macromolecular complexes at or near atomic resolution. Techniques covered include X-ray crystallography, NMR, EPR and fluorescence spectroscopies, cryo-electron microscopy, and computational modeling. Emphasis is placed on practical aspects of each technique and the range of applications for which each technique is applicable. The course is given during the first third of the semester, just preceding Biochemistry 303. Spring. [1] Chazin and Staff.

MLI 3110. Foundations of Biomedical Informatics. (Also listed as Biomedical Informatics 300) This introductory course examines the unique characteristics of clinical and life science data and the methods for representation and transformation of health data, information, and knowledge to improve health care. Principles of information security and confidentiality are taught, along with functional components of information systems in clinical settings and the use of databases for outcome management. Through skill modules and weekly programming exercises, the course provides an introduction to methods underlying many biomedical informatics applications, including information retrieval, medical decision making, evaluation of evidence, and knowledge representation. The historical evaluation of the field of biomedical informatics is taught concurrently, using examples of landmark systems developed by pioneers in the field. Fall. [3] Johnson, Weinberg.

MLI 3115. Foundations of Bioinformatics. (Also listed as Biomedical Informatics 310) This survey course introduces students to the experimental context and implementation of key algorithms in bioinformatics. The class begins with a review of basic biochemistry and molecular biology. The group will then focus on algorithms for matching and aligning biological sequences, given the context of molecular evolution. The emphasis will move from comparing sequences to the systems developed to enable high throughput DNA sequencing, genome assembly, and gene annotation. Gene products will be the next focus as students consider the algorithms

supporting proteomic mass spectrometry and protein structure inference and prediction. The informatics associated with transcriptional microarrays for genome-wide association studies will follow. Finally, the class will examine biological networks, including genetic regulatory networks, gene ontologies, and data integration. Formal training in software development is helpful but not required. Students will write and present individual projects. Fall. [3] Tabb.

MLI 3200. Biological Sciences Graduate Seminar. (Also listed as Biological Sciences 320) May be taken for credit more than once. Fall, Spring. [1] Staff.

MLI 3201. Introduction to Cell Biology. (Also listed as Biological Sciences 201) Structure and function of cells, subcellular organelles, and macromolecules. Fundamentals of organelle function, membrane transport, energy production and utilization, cell motility, cell division, intracellular transport, and mechanisms of signal transduction. Prerequisite: Biological Sciences 110a-110b. Spring. [3] Graham, Webb.

MLI 3210. Human Anatomy and Physiology I. (Also listed as NURS 210a) Introduction to the structure and function of the human organism. Integrates the gross anatomical structure of the human body and its organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Emphasis also on the clinical relevance of selected topics. Prerequisite: at least one semester of biology or chemistry. Fall. [4] Cobb.

MLI 3211. Human Anatomy and Physiology II. (Also listed as NURS 201b) Introduction to the structure and function of the human organism. Integrates the gross anatomical structure of the human body and its organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Emphasis also on the clinical relevance of selected topics. Prerequisite: at least one semester of biology or chemistry. Spring. [4] Cobb.

MLI 3222. Scientific Communication Skills. (Also listed as Pharmacology 322) Techniques in effective oral communication of scientific research as well as practical experience in research and literature presentation and in the preparation of grant proposals. Fall. [1] Iverson.

MLI 3224. Current Topics in Experimental Pathology. (Also listed as Cell and Molecular Pathology 332) Students and faculty participate in a weekly discussion of current research projects and literature. Spring. [1] Hoover and Staff.

MLI 3226. Immunology. (Also listed as Biological Sciences 226) The molecular and cellular basis of immunity. Emphasis on molecular structure, the genetic origin of diversity in B-cell and T-cell receptors, antigen presentation, and the cellular interactions leading to the immune response. Tolerance, tumor and transplantation immunity, autoimmune and immunodeficiency diseases, and allergy. Prerequisite: Biological Sciences 201 or 210. Fall. [3] Carter.

MLI 3240. Pharmacology/Receptor Theory and Signal Transduction. (Also listed as Pharmacology 324) Structure and function of cellsurface receptors and the molecular bases by which they activate cellular function. Topics include receptor identification; quantitation of simple and complex binding phenomena; molecular bases for receptor coupling to GTP-binding proteins; the structure and function of ligand-operated ion channels, receptor-tyrosine kinases and receptor-induced signal transduction cascades receptors as oncogenes and proto-oncogenes. Summer. [1-3] A. Brown.

MLI 3250. Cardiovascular Pharmacology. (Also listed as Pharmacology 325) Cardiovascular physiology and pharmacology from the molecular to the organismal level. Classic experimental studies, molecular studies, and clinical observations will be presented to demonstrate the power of interdisciplinary approaches in answering complex questions in biology. Students will have the opportunity to identify specific areas or pathophysiologic states for emphasis. Topics covered: development of the cardiovascular system, regulation of cardiac contractility and electrophysiology, blood pressure regulation, coagulation, and select cardiovascular pathophysiologies. Spring, odd numbered years. [2] Barnett.

MLI 3266. Advanced Molecular Genetics. (Also listed as Biological Sciences 266) Principles of classical and molecular genetic analysis: mutation and recombination, mapping, and the application of genetic methodology to the study of complex systems. Special emphasis on modern genomic approaches. Prerequisite: Biological Sciences 210. Spring. [3] Friedman.

MLI 3271. Modern Drug Discovery. (Also listed as Pharmacology 327) The course will provide an introduction and overview to the drug discovery process. Focus will be on target selection, target validation, and the process of discovery of early drug leads and optimization of those leads into compounds suitable for clinical development. This will include approaches used to transition from discovery to the early clinical development phase of a program as well as medical and market considerations that impact launching and progress of a drug discovery program. Fall. [2] Conn.

MLI 3280. Molecular Virology. (Also listed as Microbiology and Immunology 3282) The interaction of animal viruses with their host cells, discussed at the molecular and cellular level as model systems. Special emphasis is placed on current literature and methodology. Prerequisite: IGP 300 or an undergraduate course in biochemistry or microbiology. Fall. [3] Aiken/Dermody and Staff.

MLI 3300. Human Physiology and Molecular Medicine. (Also listed as Molecular Physiology and Biophysics 330) Lectures and research correlations on advanced aspects of human physiology, with emphasis on communication between and control of the major tissue types and organ systems. Recent biochemical and molecular biology research findings will be incorporated into the study of normal physiology and pathophysiology. This course is required of all graduate students majoring in Molecular Physiology and Biophysics. Prerequisite: consent of instructor. Fall. [3] Cobb.

MLI 3310. Scientific Communication. (Also listed as Biochemistry 327) This course will develop skills required for effective oral and written scientific communication. Students will present research from the current literature and will be required to write an NIH-formatted grant proposal to be critiqued by faculty assigned by the course director. Students not working for a degree in biochemistry must have the consent of the instructor to enroll. Fall. [2] Schey, Wagner, Osheroff, Cortez.

MLI 3312. Introduction to Developmental Biology. This combined lecture and laboratory course will present students with the basics in the analysis of standard animal models used in modern developmental biology. Central concepts in development will be presented in lecture while the student will gain "hands-on" training in the growth and care of embryos and analysis of embryonic development in model organisms. Standard methods of analysis (e.g., basic microscopy/morphological analysis, immunolabeling, time-lapse imaging, embryo microinjection) will be presented. Prerequisite: IGP Curriculum. Tuesday/Thursday; Summer. [3] Bader, Jessen.

MLI 3320. Foundations in Microbiology and Immunology I. (Also listed as Microbiology and Immunology 332) The objectives of this course are to alert students to important original research articles in microbial genetics and pathogenesis, to apply methods of scientific logic for critical analysis of the knowledge presented in the articles, and to help students present complex data and conclusions to an audience. Summer. [2] Skaar and Staff.

MLI 3324. Epithelial Pathobiology. (Also listed as Cell and Developmental Biology 324) To introduce students to issues of polarized epithelial cell function in the context of normal physiology as well as alterations associated with disease. Two one-and-a-half-hour sessions per week, one-semester course; paper presentation and discussion on Wednesday, lecture on Friday by visiting scientists. During the course, ten visiting scientists from outside Vanderbilt will present special topics changing each year. Prerequisite: open to all graduate students. Offered every other year. Spring. [3] Goldenring, Coffey.

MLI 3325. Cancer and Development. (Also listed as Cell and Developmental Biology 320) A cross-listed CDB/CB graduate-level course that will examine relationships between cellular responses in normal tissue development and cancer. The goal of the course is to familiarize the students with major cellular pathways and responses that are regulated in normal embryonic and post-natal tissue development and how abnormal reactivation of these responses gives rise to malignant disease. Offered every other year. Spring. [3] deCaestecker.

MLI 3326. Exercise Physiology. (Also listed as Molecular Physiology and Biophysics 326) The responses of different physiological systems to exercise. The effect and role of exercise under special conditions such as diabetes, reproduction, heart disease, and orthopaedics and rehabilitation. Invited speakers will discuss the clinical and scientific aspects of the above topics. Prerequisite: consent of instructor. Spring, odd numbered years. [1] Wasserman.

MLI 3327. Molecular Endocrinology. (Also listed as Molecular Physiology and Biophysics 327) A survey of the molecular biology of hormone action from the target cell surface to the nucleus. Special emphasis on (1) diabetes and obesity, (2) how receptors and intracellular messengers mediate hormone action, and (3) how hormones regulate gene expression. Discussion of the use of genetic, molecular biology, and biochemical techniques to study hormone action. The faculty encourage an interactive atmosphere in the class through the discussion of seminal papers. Fall. [2] Colbran, Cone, O'Brien, Hasty, Niswender.

MLI 3328. Metabolic Regulation in Vivo. (Also listed as Molecular Physiology and Biophysics 328) The hormonal regulation of fuel metabolism in the whole animal. Techniques which are used to study carbohydrate, lipid, and protein metabolism in vivo are discussed, as well as metabolic regulation in the normal and stressed state. Conditions such as fasting, exercise, infection, and hypoglycemia are also examined. A basic knowledge of physiology and biochemistry is required. Prerequisite: Molecular Physiology and Biophysics 321 or consent of instructor. Fall. [2] Shiota and Staff.

MLI 3329. Lipoprotein Metabolism. (Also listed as Pathology 329) Lectures, discussions, and assigned readings in the metabolism of plasma lipoproteins. Topics include the composition and structure of plasma lipoproteins; lipoprotein biosynthesis and assembly; enzymes, exchange proteins, and receptors involved in lipoprotein catabolism; and disorders of lipid metabolism. Presentation of oral reports is required. Prerequisite: an introductory course in biochemistry. Minimum enrollment six students. Spring. [2] Swift.

MLI 3330. Foundations in Microbiology and Immunology II. (Also listed as Microbiology and Immunology 333) Second semester of course work. Original research articles focus on virology. Fall. [3] Ruley and Staff.

MLI 3331. Current Topics in Developmental Biology. (Also listed as Cell and Developmental Biology 331) This course is offered in both the fall and spring semesters and meets once per week to hear a graduate student, postdoctoral fellow, or faculty member discuss a research paper from outside his or her field of research, followed by an audience question and answer session. Students taking this course are paired with a PI mentor and, together, they choose a topical scientific paper that the trainee presents at the end of the semester. Fall, Spring. [1] Wright.

MLI 3333. Fundamentals of Scientific Communication (Pathology). (Also listed as Cell and Molecular Pathology 333) Focuses on development and enhancement of skills in written and oral scientific communication, and critical thinking in scientific problem solving. Lectures, student projects, presentations, and class discussions emphasizing manuscript and research grant proposal writing, poster, and oral presentations. Spring. [3] Bock, Hoover, and Staff.

MLI 3335. The Molecular Endocrinology of Obesity and Diabetes. (Also listed as Molecular Physiology and Biophysics 333) This course is designed to introduce first-year IGP students to some of the major areas of interest in the fields of obesity and diabetes research. In the first part of the course, the lecturers will discuss the characteristics of diabetes and obesity in terms of whole-body metabolism. The use of mouse models, a major tool to study metabolism, will be emphasized. The second part of the course will focus on the insulin-producing cells of the pancreas: how they develop, how insulin secretion is regulated, and how insulin gene transcription is controlled. The third part of the course will focus on the mechanism of insulin action at the molecular level. The final part of the course will focus on the regulation of lipid metabolism and the latest theories on the molecular causes of insulin resistance and obesity. Each lecture will be presented by faculty followed by a discussion of a research paper on a related topic led by a current IGP student. January-February. [1] O'Brien and Staff.

MLI 3336. Biochemical Toxicology and Carcinogenesis. (Also listed as Biochemistry 336 and Chemistry 336) Chemical and biological aspects of toxicology and carcinogenesis, including basic principles and mechanisms, metabolism and enzymology, cellular biology, chemistry of reactive intermediates, and a survey of several classes of environmentally important compounds. Prerequisite: organic chemistry and general biochemistry. Three lectures per week. Fall. [3] Armstrong, Guengerich, Liebler, Marnett, Pietenpol, Porter, Stone.

MLI 3337. Molecular Aspects of Cancer Research. (Also listed as Cell and Developmental Biology 337 and Biochemistry 307) A focused series of seminars and discussions to explore the molecular basis of cancer. Seminars rely heavily on extramural speakers with recognized expertise in selected research areas. Discussion sections led by a faculty member follow each series of three to four seminars. Spring. [1] Hiebert and Staff.

MLI 3342. Molecular Dev Biology. (Also listed as Cell and Developmental Biology 341) This course comprises three cutting-edge areas of developmental biology per year. The aim of this course is to provide the student with a comprehensive and up-to-date understanding of fundamental issues in modern developmental biology. Faculty didactic lectures provide essential background to facilitate critical reading and discussions of the recent scientific literature. This course is modular, with each module (approximately one month) corresponding to a single thematic topic. Students meet with external lecturers. Offered every other year. Spring. [Variable credit: 1-3] Wright.

MLI 3343. Foundations in Microbiology and Immunology III. (Also listed as Microbiology and Immunology 334) Third semester of course work. Original research articles focus on immunology. Spring. [1] Boothby and Staff.

MLI 3350. Cellular and Molecular Basis of Disease A. (Also listed as Cell and Developmental Pathology 351a) An introduction to human disease and the accompanying changes in normal structure and function. The course consists of modules focused on a physiologic system and its related diseases. Each module includes a review of normal anatomy and physiology and the pathological changes occurring with the disease, an in-depth discussion of the molecular and cellular mechanisms of the disease along with clinical correlates, as well as a discussion of high-profile papers relevant to the disease. 351a (Spring) and 351b (Fall) are offered as a series, but they can be taken in any order. Prerequisite: basic knowledge of biochemistry, cell, and molecular biology. Spring. [3-3] Abdulkadir, Sephel, and Staff.

MLI 3351. Cellular and Molecular Basis of Disease B. (Also listed as Cell and Developmental Pathology 351b) An introduction to human disease and the accompanying changes in normal structure and function. The course consists of modules focused on a physiologic system and its related diseases. Each module includes a review of normal anatomy and physiology and the pathological changes occurring with the disease, an in-depth discussion of the molecular and cellular mechanisms of the disease along with clinical correlates, as well as a discussion of high-profile papers relevant to the disease. 351a (Spring) and 351b (Fall) are offered as a series, but they can be taken in any order. Prerequisite: basic knowledge of biochemistry, cell, and molecular biology. Fall. [3-3] Abdulkadir, Sephel, and Staff.

MLI 3352. Current Topics in HIV/AIDS Research. (Also listed as Microbiology and Immunology 352) This advanced course reviews recent progress in AIDS research as a platform for discussions of current research frontiers, with an emphasis on molecular interactions of the virus with host cells. Prerequisite: a graduate-level course in virology or immunology. Spring. [3] Aiken.

MLI 3370. Cell and Molecular Vascular Disease. (Also listed as Cell and Developmental Pathology 337) Lectures on contemporary research in cell biology, protein and lipid biochemistry, and molecular biology of the vascular system. Open to graduate and medical students, postdoctoral fellows, and undergraduate students with consent of instructors and the Graduate School. Prerequisite: a suitable background in biochemistry and cell biology. Fall. [3] Bock, Hoover.

MLI 3385. Fundamentals of Genetic Analysis. (Also listed as Molecular Physiology and Biophysics 385) This course is designed to accomplish three goals: (1) introduce students to critical topics of genetic research, (2) introduce students to important areas of genetic research not covered in first-year course work, and (3) promote an understanding of classical genetic analysis by learning genetics using the original literature. The approach will be to use classic literature that defined significant problems in genetic research. Specific topics will include: genetic analysis (segregation, independent assortment and locus mapping), human pedigree analysis and disease gene mapping, and population/quantitative genetics. Fall. [4] Williams and Staff.

MLI 3400. Human Genetics I. (Also listed as Molecular Physiology and Biophysics 340 and HGEN 340) Designed to cover background and latest advances in human molecular genetics. Topics will include an overview and in-depth look at molecular genetics including DNA, RNA, and chromosome basics. Gene structure and transcriptional processing. Mutational mechanisms, biochemical genetics (gene defects in biochemical pathways). Topics will be discussed with use of real-world examples and relevance to human research. Fall. [3] Summar, Mortlock, and Staff.

MLI 3410. Human Genetics II. (Also listed as Molecular Physiology and Biophysics 341 and Human Genetics 341) This course will cover the statistical, population, and analytical aspects of modern human genetics research. Topics to be covered include human population genetics, quantitative genetics, disease gene discovery (emphasizing design, statistical and molecular techniques), linkage and association analyses, computational genetics, and evolutionary genetics. Clinical examples, subject ascertainment, and study design will also be emphasized. Students must have a strong understanding of Mendelian genetics and basic biostatistics. Prerequisite: consent of instructor. Spring. [3] Haines and Staff.

MLI 3419. Introduction to Cancer Biology. (Also listed as Cancer Biology 340) This is a didactic lecture series in which general concepts in cancer biology will be reviewed. Topics range from molecular biology of cancer (oncogene and tumor suppressors) to novel concepts such as cancer stem cells and therapeutic approaches. Prerequisite: IGP core course or consent of instructor. Fall. [2] Yull.

MLI 3420. Advanced Concepts in Cancer Biology. (Also listed as Cancer Biology 342) Advanced concepts in cancer biology will be reviewed in depth using a combination of lectures and student-led discussion sessions based on current literature. This course is offered only in tandem with the Introduction to Cancer Biology course to be taken concurrently. Prerequisite: must be a Cancer Biology graduate student or have consent of instructor. Fall. [4] Fingleton.

MLI 3440. Systems Neuroscience. (Also listed as Neuroscience 340) Allows students to develop a working knowledge of neural networks and brain systems and the techniques used to study these functions. Includes an introductory overview of neuroanatomy, physiology, and behavior, and then moves on to the sensory and motor systems, motivation, and learning and memory. Fall. [4] Casagrande/Deutch.

MLI 3444. Current Topics in Cancer. (Also listed as Cancer Biology 344) This is a graduate-level course focusing on cancer as a complex biological system. The goal of this course is to provide the students with comprehensive and up-to-date knowledge about the dynamic and spatial interactions that exist among molecules in a cancer cell, between cancer cells and their "microenvironment," and between the organism and its "macroenvironment." This class will integrate multiple cutting-edge research approaches from several disciplines, including cancer biology, proteomics and bioinformatics, functional imaging, mathematical modeling and bioengineering, and epidemiology. Class will include both presentations by the instructors and discussion of recent publications by students. Spring. [2] Lin.

MLI 3455. Cellular and Molecular Neuroscience. (Also listed as Cell and Developmental Biology 345, Molecular Physiology and Biophysics 345, Neuroscience 345, and Pharmacology 345) This course is a required entry-level course for students in the Cell and Molecular Track of the Neuroscience Graduate Program at Vanderbilt that should be taken in the first graduate school year. It also serves as an elective for medical students and graduate students in a number of other programs. Its goal is to expose students to fundamental concepts and techniques in molecular and cellular neuroscience and provide a theoretical context for experimental analysis of brain function and disease. The course is divided into three modules. Module I: Neural Anatomy and Development provides an overview of the anatomy of the nervous system and neurotransmitters and examines concepts in neural pattern formation, neuronal migration, axon guidance, and synapse formation. Module II: Signaling, Plasticity, and Modulation reviews biophysical and molecular concepts relating to neuronal membrane excitability, secretion, and plasticity. Module III: Neural Diseases and Disease Models focuses on specific brain disorders such as epilepsy, pain disorders, Alzheimer's disease, depression, and schizophrenia and current models used to investigate their origin and/or treatment. This course combines faculty lecture with discussion of original articles, with an emphasis on fundamental concepts and the elucidation of important research paradigms in the discipline. Faculty and assistants guide students through important research paradigms with a critical analysis of the primary literature in the topic area. Prerequisite: Bioregulation I (IGP 300A) or consent of instructor. Course directors may consider undergraduate course work in cell biology or biochemistry to meet this requirement. Spring. [4] Currie, Carter, and Staff.

MLI 3456. Molecular and Cellular Immunology. (Also listed as Microbiology and Immunology 328C) The cellular and molecular foundations of the immune response system and the humoral and cellular reactions that result from immunologic interactions. Two lectures per week and seminars presented by students. Prerequisite: IGP 300 or any microbiology course. Fall. [3] Staff.

MLI 3500. Tutorials in Human Genetics. Tutorials in Human Genetics. (Also listed as Human Genetics 370) A weekly seminar critically evaluating current and past scientific literature from many areas of genetic research. The focus will be on study methods and analysis. Fall. [1] Canter, Kearney.

MLI 3510. Functional Genomics and Proteomics: Applications to Immunobiology. (Also listed as Microbiology and Immunology 351) Biological applications of functional genomics and proteomics in immunology. Topics include (1) proteomic analysis of blood cells, vascular endothelial cells, and smooth muscle cells involved in immunity and inflammation, (2) functional genomics of immunobiology using genome-wide mutagenesis, (3) gene expression profiling of immune/inflammatory responses based on DNA microarray technology, (4) peptide/protein transduction and its applications to cellbased proteomics and intracellular protein therapy, (5) proteomic analysis of MHC antigens, (6) genomics and proteomic analysis of host-pathogen interactions, (7) genomic and proteomic analysis of immunological diseases, and (8) development and application of new genomic and proteomic strategies in immunology. Spring. [2] Link, Hawiger, Staff.

MLI 3520. Analytical Proteomics. (Also listed as Biochemistry 352) Introduces analytical proteomics methods and approaches through lectures, directed readings, and group and individual data analysis exercises. Topics include (1) characteristics of proteomes and protein diversity, (2) mass spectrometry approaches to protein and peptide analysis, (3) protein and peptide separation methods, (4) bioinformatics tools for identification of proteins from MS data, (5) quantitative proteomics methods, (6) applications of proteomics in common experimental designs, and (7) tissue proteome profiling and imaging approaches. Spring. [2] Chaurand, Friedman, Ham, Liebler, Slebos, Tabb, Zhang, Zimmerman.

MLI 3540. Clinical Neuropsychology. (Also listed as Psychology 354) Cognitive and behavioral disorders associated with brain injury and disease. Methods of neuropsychological assessment. Prerequisite: permission of instructor. [3] Zald. (Not offered 2009/2010) Courses leading to the Doctor of Medical Physics and the Master of Science in Medical Physics

Diagnostic Radiology

RAMD 5208. Differential Equations. (Also listed as MATH 208) Firstand second-order differential equations, applications, linear differential equations, series solutions, boundary-value problems, existence and uniqueness theorems. Intended for mathematics and advanced science majors. Prerequisite: multivariable calculus and linear algebra. Spring. [3] Peterson.

RAMD 5210. Anatomy and Physiology Part 1. (Also listed as Nursing 210a) Introduction to the structure and function of the human organism. Integrates the gross anatomical structure of the human body and its organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Emphasis also on the clinical relevance of selected topics. Prerequisite: at least one semester of biology or chemistry. Fall. [4] Cobb.

RAMD 5212. Anatomy and Physiology Part 2. (Also listed as Nursing 210b) Introduction to the structure and function of the human organism. Integrates the gross anatomical structure of the human body and its organ systems with microscopic structure, physiological function, and homeostatic mechanisms. Emphasis also on the clinical relevance of selected topics. Prerequisite: at least one semester of biology or chemistry. Spring. [4] Cobb.

RAMD 5215. Introduction to Quantum Physics and Applications I. (Also listed as Physics 225W.) A survey of modern physics and applications based on elementary quantum mechanics: atomic and molecular structure, interaction of light with atoms and molecules, spectroscopy. One three-hour laboratory per week. Fall. [4] Haglund, Velkovska.

RAMD 5216. Introduction to Quantum Physics and Applications II. (Also listed as Physics 226W.) A survey of modern physics and applications based on elementary quantum mechanics: atomic and molecular structure, interaction of light with atoms and molecules, spectroscopy. One three-hour laboratory per week. Spring. [4] Maguire, Helms.

RAMD 5217. Introduction to Quantum Physics and Applications I and II Lab. Lab only. A survey of modern physics and applications based on elementary quantum mechanics: atomic and molecular structure, interaction of light with atoms and molecules, spectroscopy. One three-hour laboratory per week. Faculty approval required. Fall. [1] Haglund, Velkovska.

RAMD 5218. Radiation Detectors and Measurements. (Also listed as Physics 285.) Basic physics principles and applications of radiation detecting instruments, with laboratory exercises. Techniques and instrumentation for nuclear radiation detection and measurements as they relate to health physics (radiation safety) and nuclear physics. Spring. [4] Stabin.

RAMD 5228. Physics of Medical Imaging. (Also listed as Physics 228.) Physics and engineering of image formation for medical applications. Mathematical concepts of image formation and analysis; techniques for recording images using ionizing radiation (including CT), ultrasound, magnetic resonance, and nuclear (including SPECT and PET). Methods of evaluating image quality. Spring. [3] Peterson.

RAMD 5270. Ethics and Medicine. (Also listed as Philosophy 270) Selected ethical issues raised by clinical practice, medical theories, and biomedical research and technology. Spring. [3] Bliton.

RAMD 5301. Medical Physics Master's Seminar. Topics in medical imaging, techniques and applications. Fall. [1] Price.

RAMD 5307. Radiation Dose Assessment. (Also listed as Physics 307) Description of models and methods for internal and external dose assessment. Historical and modern methods for calculating radiation dose, and will gain proficiency in their use by working examples and applying the principles to project analyses. Prerequisite: Physics 243, 304. [3] Stabin.

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] Pickens.

RAMD 5315. Laboratory in Clinical Diagnostic Physics. (Also listed as Physics 315.) Laboratory in the application of principles, techniques, and equipment used in radiographic and fluoroscopic x-ray, CT, MRI, nuclear medicine, and ultrasound. Fall. [2] Riddle.

RAMD 5320. Special Topics. (Also listed as BME 395) Introduction to quantitative analysis of non-invasive imaging techniques to assess the structure and function of tissues in the body. Applications of computed tomography, positron emission tomography, ultrasound, and magnetic resonance imaging to tissue characterization. Measurement of lesion volume, cardiac output, organ perfusion, brain function, and receptor density. Prerequisite: BME 258 and CS 103 or equivalent. Fall. [3]

RAMD 5329. Advanced Computational Modeling and Analysis in Biomedical Engineering. (Also listed as Biomedical Engineering 329) Survey of current topics within biomedical modeling: biotransport, biomechanics, tumor and virus growth dynamics, model-based medical imaging techniques, etc. Mathematical development and analysis of biomedical simulations using advanced numerical techniques for the solution of ordinary and partial differential equations. Emphasis will be on graduate research related topics. Spring. [3]

RAMD 5343. Health Physics. (Also listed as Physics 243.) Theory and instrumentation used in health physics and radiological physics. Radiation shielding design, methods of external and internal design, and radiation regulatory issues. Fall. [3] Stabin.

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 Practicum (Diagnostic). 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. Spring. [0-6] Price.

RAMD 5393. Doctoral Independent Study (Diagnostic). Advanced problem solving topic in diagnostic medical physics including literature survey, data taking, analysis, and manuscript submission. Fall, Spring, Summer. [6]

RAMD 5395. Medical Physics Clinical Rotations (Diagnostic). 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 Doctoral Seminar. Topics in medical imaging, techniques and applications. Fall, Spring. [1] Price.

Therapeutic Radiology

RAMT 5248. Radiation Biophysics. (Also listed as Physics 248) Response of mammalian cells and systems to ionizing radiation, the acute radiation syndromes, carcinogenesis, genetic effects, and radiobiological basis of radiotherapy. Fall. [2] Freeman.

RAMT 5301. Medical Physics Master's Seminar. Radiotherapy treatment techniques and current methodologies in clinical therapy physics. Fall, Spring. [1] Chakravarthy.

RAMT 5304. Radiation Interactions and Dosimetry. (Also listed as Physics 304) 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] Ding.

RAMT 5311. Clinical Therapy Physics I. (Also listed as Physics 311) 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] Coffey. **RAMT 5312. Clinical Therapy Physics II.** (Also listed as Physics 312) Photon and electron beam algorithms for dosimetry calculations. Methodologies in three-dimensional treatment planning with specific applications to radiotherapy. Spring. [2] Duggan.

RAMT 5314. Clinical Therapy Physics I: Lab. 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. Spring. [2] Coffey.

RAMT 5315. Clinical Therapy Physics II: Lab. 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. Fall, Spring. [2] Coffey.

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. Fall. [3] Coffey.

RAMT 5340. Introduction to Cancer Biology. (Also listed as Cancer Biology 340) This is a didactic lecture series in which general concepts in cancer biology will be reviewed. Topics range from molecular biology of cancer (oncogene and tumor suppressors) to novel concepts such as cancer stem cells and therapeutic approaches. Fall. [2] Yull.

RAMT 5390. Master's Independent Study (Therapeutic). Introductory problem-solving topic in therapy medical physics including data taking, analysis, and write-up. Fall, Spring, Summer. [1-2]

RAMT 5391. Medical Physics Practicum (Therapy). 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. Spring. [0-6] Coffey.

RAMT 5393. Doctoral Independent Study (Therapeutic). Advanced problem solving in therapy medical physics including literature survey, data taking, analysis, and manuscript submission. Fall, Spring, Summer. [6]

RAMT 5395. Medical Physics Clinical Rotations (Therapeutic). 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 Doctoral Seminar. Topics in clinical therapy physics, techniques and application. Spring, Summer. [1] Coffey.

Public Health

Courses leading to the Master of Public Health

PUBH 5501. Epidemiology I. This introduction to epidemiology 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. Enrollment is limited. Fall. [4] Griffin.

PUBH 5502. Biostatistics I. 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. Enrollment is limited. Fall. [4] Arbogast.

PUBH 5504. Clinical Trials. Introduces issues in design, conduct, and data analysis of clinical trials, emphasizing practical use of methods. Topics include types/objectives of the clinical trials, study design, blindness,

randomization and stratification, sample size determination, interim monitoring, ethical guidelines, data analysis and interpretation of results. The parallel design, factorial designs, cross-over designs, nested designs for superiority, non-inferiority, clinical equivalence and bioequivalence trials will be discussed. Other topics include role of clinical trials in FDA drug approval process, meta-analysis, and management of clinical trial data. Enrollment is limited. Fall. [4] Shyr.

PUBH 5508. Epidemiology II: Non-randomized Study Design. The design of non-randomized studies, including factors that are important in design selection. The design of cohort studies, including rationale for use of the cohort study, 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, including rationale for use, conditions necessary for validity of the case-control study, selection of controls, sources of bias in case-control studies, and multivariate analysis. The ecological study, including when to use and when to avoid. Designs to usually avoid: cross-sectional, case-series, and exposed-subject designs. The course includes didactic lectures and critical reading of important epidemiologic studies from the current medical literature. The latter encompasses discussion of the articles in small groups and structured presentation to the class. Prerequisite: Epidemiology 1, Biostatistics 2, Clinical Trials, or approval of instructor. Enrollment is limited to twenty-four students due to space restrictions, with priority given to M.P.H. and M.S.C.I. students. Spring. [4] Ray.

PUBH 5509. Biostatistics II. Modern multivariate analyses, based on the concept of generalized linear models. Includes linear, logistic, and Poisson regression, survival analysis, fixed effects analysis of variance, and repeated measures analysis of variance. Course emphasizes underlying similarity of these methods, choice of the right method for specific problems, common aspects of model construction, and the testing of model assumptions through influence and residual analyses. Prerequisite: Biostatistics 1 or consent of the course director. Enrollment is limited. Spring. [4] Dupont.

PUBH 5512. Clinical Economics and Decision Analysis. This course will provide an overview of qualitative and quantitative decision making with a dominant focus on quantitative techniques for decision making, using clinical and economic endpoints and their role in clinical strategies of care and health policy. Topics include: cognitive heuristics, Baye's 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. Students may substitute this elective course for a portion of the dissertation research credit. Offered every other year. Fall. [3] Penson.

PUBH 5514. Health Behavioral Methods: Measurement and Motivation. The course will address two core areas in health behavior research: (1) the measurement of knowledge, attributes, attitudes, and behaviors that are relevant to health behavior research, with a focus on scale development and (2) the dispositional and situational variables that underlie current theories of behavior and behavior change, with current applications. Spring. [3] Elasy.

PUBH 5516. Environmental Health. This course will review the three key public health functions of assessment, policy development, and assurance in relationship to environmental health issues. Topics covered will include public health surveillance activities including bioterrorism issues, food safety, air pollution, and genetics and public health. Students will learn where to obtain publicly available population data on health-related events from a variety of surveillance activities and special surveys. Summer. [2] Vergara.

PUBH 5517. Grant Writing and Scientific Communication. 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 limited to matriculants in the M.P.H. or

M.S.C.I. programs. M.P.H. matriculants must have completed Epidemiology 2. Enrollment is limited. Summer. [1] Ray, Brown.

PUBH 5518. Research Ethics. 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). Summer. [1] Cooper.

PUBH 5519. MPH Seminar. A research seminar at which each student presents the results of the thesis research. This will be organized into a one hour presentation with a background and significance, methods, results, and public health/research Implications covered. A total of four seminars are scheduled each year. Each student schedules a presentation at one of these (four maximum) on a first-come, first-served basis. Students are encouraged to attend all of the others and must attend at least one. Students must obtain approval of their thesis committee prior to presenting. Fall. [1] Cooper.

PUBH 5527. Protocol Development. 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. Each student will complete the research protocol for the student's master's thesis as a part of the course. Enrollment is limited to students in the M.P.H. program. Summer. [1] Cooper.

PUBH 5528. MPH Project Extension. Fall, Spring, Summer. [0] Staff.

PUBH 5536. Public Health Practicum. Each student will participate in a public health practicum which will provide students with opportunities to develop practical skills and competencies in public health practice settings. Fall. [4] Griffin.

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PUBH 5537. Health Services Administration I : Healthcare Systems. This course provides an overview of the organization, financing, and delivery of healthcare. The course will review the complex inter-relationships among key stakeholders in the industry, how this structure has evolved over time, and how these system wide challenges are likely to affect healthcare policy in the future. Prerequisite: Epidemiology 2, Biostatistics 2 or approval of instructor. [1"{This course provides an overview of the organization, financing, and delivery of healthcare. The course will review the complex inter-relationships among key stakeholders in the industry, how this structure has evolved over time, and how these system wide challenges are likely to affect healthcare policy in the future. Prerequisite: Epidemiology 2, Biostatistics 2 or approval of instructor. Spring. [1] Van Horn.

PUBH 5538. Health Services Administration II : Program and Policy Evaluation. 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. Class will include didactic lectures and small group critical reading/presentation of current program/ policy evaluations published in leading medical journals. Prerequisite: Epidemiology 2, Biostatistics 2 or approval of instructor. Offered every other year. Spring. [3] Ray.

PUBH 5539. Health Services Administration III: Public Health Delivery. This course focuses on the organization, financing, and delivery of public health systems. Topics will include organization of public health systems, strategies for financing public health interventions, public health leadership and communications, emergency management, the interface between law, government, and public health, the delivery of public health in international settings, and cultural competency in public health systems. The course will include lectures, case studies of public health systems, and small group discussions. Spring. [1] Gunn.

PUBH 5599. Dissertation Research. The primary objective is completion of the thesis project. The student will coordinate dissertation research activities with the thesis committee. Fall, Spring, Summer. [1-6] Cooper.

Research in Medical Sciences

Endowed Research Funds

THE RACHEL CARPENTER MEMORIAL FUND. This fund was established in 1933 by a gift from Mrs. Mary Boyd Carpenter of Nashville. The income derived from the fund is to be used for education in the field of tuberculosis.

THE BROWNLEE O. CURREY MEMORIAL FUND FOR RESEARCH IN HEMATOLOGY. This is a memorial fund created by the friends of Brownlee O. Currey. The income is being used for the support of research in the field of hematology.

THE JACK FIES MEMORIAL FUND. The income from a gift to Vanderbilt by Mrs. Hazel H. Hirsch as a memorial to her son, Jack Fies, is to be used to support research in the field of neurosurgery. It is hoped that subsequent donations will be made by those who may be interested in creating a larger fund for this phase of research.

THE JOHN B. HOWE FUNDS FOR RESEARCH. In January 1946, the members of the family of the late John B. Howe established two funds in the university to be known as the John B. Howe Fund for Research in Neurosurgery and the John B. Howe Fund for Research in Medicine. The expenditures from the funds for neurosurgery and medicine are administered through the Department of Surgery and the Department of Medicine.

THE BEQUEST OF AILEEN M. LANGE FOR MEDICAL RESEARCH. To be used for medical research in preventing and curing ailments of human beings.

THE ANNIE MARY LYLE MEMORIAL FUND FOR MEDICAL RESEARCH. This gift is to be used for basic or applied research in medical science, particularly cardiovascular research or another area of need.

THE NEUROLOGY RESEARCH FUND. Funds to be used for research efforts in the field of neurology.

THE MINNIE J. ORR FUND FOR RESEARCH IN POLIOMYELITIS OR HEART DISEASE.

THE MARTHA WASHINGTON STRAUS-HARRY H. STRAUS FOUNDA-TION, INC. The foundation provides support for research in the Department of Medicine in the field of cardiovascular diseases.

THE LESLIE WARNER MEMORIAL FUND FOR THE STUDY AND TREAT-MENT OF CANCER. This fund was established in 1932 in the memory of Leslie Warner of Nashville, Tennessee. Half of the founding grant was contributed by the nieces and nephews of Mrs. Leslie Warner.

Multi-Investigator Research Centers and Programs

Vanderbilt AIDS Center

The Vanderbilt AIDS Center supports all HIV-related research and helps coordinate HIV care and provider education. Several multi-investigator NIH grants support the full spectrum of HIV research, from clinical trials to basic virology and immunology. The Vanderbilt Meharry Center for AIDS Research (CFAR) grant is a key component. The Vanderbilt Meharry CFAR was established in 2003 to strengthen HIV/AIDS research across both Vanderbilt and Meharry campuses, as well as the Comprehensive Care Center. It is one of twenty CFARs at academic medical centers across the United States that are competitively funded by the NIH. CFAR aims to synergistically enhance HIV/AIDS research by providing expertise, resources, and services that foster interdisciplinary collaboration, especially on translational research. The Vanderbilt Meharry CFAR focuses on research into disparities in the HIV epidemic, and collaborates closely with the Vanderbilt Institute for Global Health. Other NIH funded multi-investigator projects include the Vanderbilt HIV Clinical Trials Unit, with sites for the national AIDS Clinical Trials Group and the HIV Vaccine Trials Networks. The AIDS Center also works closely with the Comprehensive Care Center and other community partners in the fight to stop the HIV epidemic.

Center for Child Development

The Center for Child Development provides interdisciplinary screening, evaluation, and intervention services for children from birth to 21 years who either have or are suspected of having developmental problems. The center has a range of specialized programs that address the needs of children, especially those under age 6, with different disabilities.

Center for Biomedical Ethics and Society

The mission of the Center for Biomedical Ethics and Society is to provide leadership in education, research, and clinical service at VUMC concerning the ethical, legal, and social dimensions of medicine, healthcare, and health policy. The center is committed to multi-disciplinary exploration of the individual and social values, cultural dynamics, and legal and professional standards that characterize and influence clinical practice and biomedical research. The center aims to be a catalyst for collaboration in teaching, research, and practice at Vanderbilt and to contribute to scholarship and policy making from the local to the international level.

Free-Electron Laser Center

The Vanderbilt University Free-Electron Laser (FEL) Center is a multi-disciplinary research program dedicated to exploring medical applications of high-power, tunable radiation available from unique accelerator-based light sources-the Mark III FEL and our novel monochromatic X-ray system. These light sources provide unique opportunities for novel biomedical uses, and increased understanding of the basic physical interactions between light and matter, and are complemented by a wide array of state-of-the-art imaging and spectroscopic systems. The center involves research groups from the School of Medicine, the School of Engineering, and the College of Arts and Science, but the heart of our program lies in the development of clinical treatment protocols. Our approach is an "atoms to humans" model in which the underlying science is explored in support of the clinical results. Often, insights into the clinical procedures come from basic physical studies of laser/materials interactions. Still, the focus on eventual clinical treatments is never lost, and the involvement of physicists, chemists, biologists, and engineers is in the service of medicine. To facilitate the widespread use of the new clinical applications, we will use our understanding of the underlying mechanisms and our technological infrastructure to develop dedicated, stand-alone laser systems for use in the military and civilian communities. Our efforts towards the development of new table-top laser sources that are dedicated to performing specific surgical applications will allow the

surgical protocols developed with the FEL to be transferred to a large number of hospitals and other clinical settings. We have also developed several interactive programs around campus. In collaboration with the Vanderbilt Institute of Chemical Biology, we are investigating specific optical molecular probes that can be used for in vivo molecular imaging to guide the therapeutic applications. In collaboration with the Center for Structural Biology, we are investigating the use of the monochromatic X-ray system for "synchrotron quality" X-ray crystallography experiments here at Vanderbilt.

Center for Human Genetics Research

The Vanderbilt Center for Human Genetics Research (CHGR) was initiated in July, 1997, to bring a focus to human genetic research at Vanderbilt, to foster the expansion of this research, and to help develop appropriate training activities for a growing number of students interested in human genetics. The central theme of the CHGR is the understanding of how genes influence complex traits; traits that are influenced by the intricate interplay of multiple genes and environmental factors. This encompasses research at the molecular, clinical, and population levels performed by faculty in multiple departments and schools.

Center for Lung Research Division of Allergy, Pulmonary, and Critical Care Medicine

This center stimulates and facilitates lung research and training throughout the institution. Center investigators represent nine departments and are engaged in a wide range of basic and clinical research. These investigators work both individually and in collaboration with many other faculty members. The center serves to identify important research opportunities, to assist investigators in identifying collaborators within and outside the institution, and to facilitate the research process by providing physical facilities, financial support, and administrative and scientific expertise. The center maintains close relationships with the departments of medicine, cell biology, pediatrics, pathology, biomedical engineering, pharmacology, and molecular physiology and biophysics, as well as with other departments in the schools of medicine and engineering.

Center for Matrix Biology

The mission of this center is to foster cohesive interactions among Vanderbilt University scientists who work, directly or indirectly, on extra cellular matrix biology in order to facilitate collaborations, promote excellence in matrix research and acquire funding support.

Center for Molecular Neuroscience

The Center for Molecular Neuroscience supports research and training of neuroscientists who utilize sophisticated genetic, cell biologic, biochemical and biophysical techniques to understand fundamental aspects of development, signaling and disease in the brain. Major research foci of faculty are in neuronal development and differentiation, control of membrane excitability, mechanisms of synaptic plasticity, elucidation and analysis of drug actions in the brain, and altered gene/ protein function in mental illness. Faculty of the CMN utilize state-of-the art molecular and transgenic techniques to understand how key genes control brain development and function and to develop new animal models for syndromes such as ADHD, Parkinson's disease, and Alzheimer's disease.

Center for Molecular Toxicology

The Center for Molecular Toxicology is a National Institute of Environmental Health Science-funded research center. The center's overall research goals are to understand phenomena of toxicological interest in chemical terms, answer questions related to toxicity at the biochemical level, and apply such chemical and biochemical knowledge to problems involving human health.

Center for Space Physiology and Medicine

To demonstrate its commitment to research in the physiological challenges of manned space flight, Vanderbilt University Medical Center established the Center for Space Physiology and Medicine in 1989. Under the direction of David Robertson, M.D., Professor of Medicine, Pharmacology, and Neurology, and F. Andrew Gaffney, M.D., Professor of Medicine, the center's mission is to direct and coordinate the medical center's space-related research. The collaborating members of the medical faculty are internationally recognized authorities in many areas relevant to manned space flight. The center also has close ties to scientists within NASA centers and to Russian investigators in the Institute for Biomedical Problems and the Russian Cardiological Research Center in Moscow.

Center for Structural Biology

The transinstitutional Center for Structural Biology, founded in 2000, is a new transinstitutional research and training unit that focuses on the integrated application of structural methods for solving fundamental problems in medicine and biology. The center also provides education and training in all areas of structural biology to all interested researchers on campus. Faculty, drawn from eight departments in the College of Arts & Science and the School of Medicine utilize NMR, EPR and fluorescence spectroscopes, X-ray crystallography, cryo-electron microscopy and computational techniques to understand a range of critical events such as signal transduction, viral infection, the replication of genes in healthy cells, and the malfunction of the repair of damaged genes in cancer.

Clinical Nutrition Research Unit Division of Cardiovascular Medicine

The Clinical Nutrition Research Unit (CNRU) is funded by the NIDDK to promote nutrition research and education at Vanderbilt. Nutrition research is carried out by faculty members in most academic departments and extends from basic laboratory research to clinical and applied research. A particular mission of the CNRU is to encourage translation of basic research to patient care. To this end the CNRU encourages information exchange and collaboration. It supports research cores that bring nutrition investigators together to discuss their work. It supports a seminar series to bring in outside nutrition scientists to speak to the Vanderbilt nutrition community.

Diabetes Research and Training Center

The Diabetes Research and Training Center (DRTC) at Vanderbilt is one of a network of centers established by the National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) to conduct research and training in diabetes mellitus and related endocrine and metabolic disorders. The DRTC is a multidisciplinary program with 95 participating faculty members distributed among fourteen departments in two schools and three colleges of the university. The Biomedical Research Component consists of a research base of 65 investigators in the areas of in vivo metabolism, signal transduction, etiology and complications, gene regulation, beta cell function, demonstration and education.

Digestive Disease Research Center Division of Gastroenterology

The Digestive Disease Research Center (DDRC) is a multidisciplinary center at Vanderbilt University Medical Center developed to serve a number of purposes. The center promotes digestive diseases-related research in an integrative, collaborative and multidisciplinary manner. In addition to enhancing the basic research capabilities of established DDRC investigators, the center attracts investigators not involved in digestive diseases-related research to pursue these lines of investigation, in order to develop and implement programs for training and establishment of young investigators in digestive diseases-related research and facilitate the transfer of basic research findings to the clinical area.

Frist Nursing Informatics Center

The Frist Nursing Informatics Center is housed on the second floor of Frist Hall. Faculty, staff and student support is provided for various informatics applications, including handheld devices, clinical log software, use of Blackboard (Web-based course template system), survey design, and other knowledge building tools. In addition, a computer lab environment supports online learning activities with additional lab machines available for online testing.

Clinical Research Center

See Vanderbilt Institute for Clinical and Translational Research (VICTR) on page 93 below.

Vanderbilt O'Brien Mouse Kidney Physiology and Disease Center

The mission of the Vanderbilt O'Brien Mouse Kidney Physiology and Disease Center (VOMKPDC) is to advance medical and biological mouse models of kidney disease and to provide experimental platforms to test potential therapeutic interventions. The center is based on the establishment of four distinct, yet interlinked, biomedical cores at two institutions: a phenotyping and pathophysiology core (Vanderbilt), a histology and morphometry core (Vanderbilt), an *in vivo* imaging core (Vanderbilt), and a renal transgenic core (University of Utah). By bringing nephrologists, pathologists, histologists, and cell and molecular biologists together with experts in renal cell-specific transgenic technology, this center provides an extended research base that enhances the efficiency of medical and biological research using mouse models of kidney disease.

Informatics Center

The Informatics Center at Vanderbilt functions as a highly effective system of people, processes and technology working at all levels of the medical center to improve health care using information technology and communication to change the face of health care to provide the best care, education, and research possible.

Institute for Experimental Therapeutics

The Institute for Experimental Therapeutics builds on Vanderbilt's internationally recognized strengths in human

pharmacology. The major missions of the Institute are to investigate mechanisms underlying variability in drug actions in humans, and to translate those results into more effective use of available drugs and the development of improved drug therapies.

Institute for Global Health

The Institute for Global Health fosters interdisciplinary research, teaching, and service activities linked to health and/ or development in resource-limited settings of the developing world. The Institute helps strengthen and sustain the interests and activities of the Vanderbilt community by:

- Facilitation of international contacts for program development and training
- Advocacy for better equity in global health investments
- Assistance in securing resources for international activities
- Standardization and facilitation of overseas administrative approaches
- Improved communication through grand rounds, seminars, and discussion forums
- Active partnerships with institutions in the U.S. and abroad that share the Institute's goals and wish to partner with Vanderbilt faculty, staff, and students.

By facilitating the involvement, development, and growth of collaborations aimed at addressing problems in resourcelimited settings, the Institute expects Vanderbilt itself to be enriched in its diversity and sensitivity to the global challenges in health and development. By serving as a facilitating body for expanding the activities of individual scientists and departments across the Vanderbilt campus, the Institute expects to aid multidisciplinary research efforts in diseases of poverty, tropical climes, and health disparities.

Elizabeth B. Lamb Center for Pediatric Research

The Elizabeth B. Lamb Center is dedicated to research in infectious diseases of children. The center is an interdisciplinary research unit combining interests in infectious diseases, immunology, microbiology, and pathology. It is located within the Division of Pediatric Infectious Diseases. The primary mission of the Lamb Center is to foster basic biomedical research with the goal of developing new approaches for the prevention and treatment of childhood infectious diseases.

Institute for Medicine and Public Health

The mission of the Institute for Medicine and Public Health is to improve personal and public health through discovery, training, and service programs designed to protect against threats to health, promote healthier living, improve quality of health services, and prepare leaders to advance health and health care. Its goal is to improve the quality, safety, equity, and efficiency of public and personal health services, with the ultimate goal to improve the health of all citizens.

Mass Spectrometry Research Center

The five areas that compose the Mass Spectrometry Research Center Research and Development, MS Core Service, Proteomics, Serum and Biofluids Core, and Bioinformatics provide the local research community with world-class instrumentation and collaborative support of cutting-edge research in the medical and bioscience fields. The Research & Development Laboratory is focused on the development of new mass spectrometry and data analysis techniques that can be applied to problems of medical significance. The Mass Spectrometry Service Laboratory is an advanced shared instrument facility. The MS Core Service provides cost effective, state-of-the-art instrumentation to students, fellows and faculty for identification and structural analysis of biological molecules and for qualitative and quantitative assays of drugs and metabolites in physiologic fluids. The Proteomics Lab provides assistance with or participation in proteomic studies. The Tissue and Biofluids Core Laboratory direct proteome profiling and protein imaging of intact tissues by MALDI-MS. The Core also provides proteome profiling of serum, plasma, and other biofluids by MALDI-MS and analysis of biofluid proteome fractions by "shotgun" LC-MS-MS methods. The newly established Bioinformatics Group develops new algorithms, software, and database tools for analysis of mass spectrometry data for proteomics and other applications within the MSRC. This group interacts with faculty in the Developments of Biomedical Informatics and Biostatistics, bringing together new analytical technologies with computational and statistical approaches to large complex datasets in biomedical research.

Vanderbilt Bill Wilkerson Center for Otolaryngology and Communication Sciences

The Vanderbilt Bill Wilkerson Center for Otolaryngology and Communication Sciences was created in 1997 to fill a need for ear, nose, and throat doctors and hearing and speech therapists to work side by side for the benefit of their patients with communication and otolaryngological diseases and disorders. The center is composed of the Vanderbilt Department of Hearing and Speech Sciences (formerly the Bill Wilkerson Center) and the Vanderbilt Department of Otolaryngology. The center offers diagnosis and treatment for a wide range of conditions that affect hearing, speech, language and voice production, as well as more than twenty research laboratories addressing basic and applied issues in Otolaryngology and Hearing and Speech Sciences.

The Vanderbilt Brain Institute

The Vanderbilt Brain Institute unites campus-wide neuroscience to facilitate interdisciplinary research, training and public outreach. The VBI's mission is to:

- be a communication center for transinstitutional neuroscience
- advance neuroscience educational initiatives
- spearhead fund-raising in interdisciplinary research and training
- coordinate public relations and community outreach programs

Vanderbilt Center for Bone Biology

The Vanderbilt Center for Bone Biology was created to investigate diseases of bone and mineral metabolism, which are now widely recognized as major public health problems. Although the last 15 years have seen an upsurge of interest in these diseases, this is not yet reflected by major changes in the way these diseases are treated or our understanding of what causes them. Technologic improvements in investigating mechanisms involved in normal bone remodeling, together with the widespread use of genetic mouse models to identify molecules responsible for common bone diseases, may now make it possible to unravel the pathophysiology of some of these common bone diseases, and to develop new diagnostic tools and treatments that could change the quality of life for many patients. The new Vanderbilt Center for Bone Biology is in the process of assembling a cadre of well-trained investigators to address these issues, with an initial primary focus on osteoporosis, and cancers such as breast cancer, prostate cancer, and myeloma, which frequently affect the skeleton, and pharmacologic enhancement of fracture repair.

Vanderbilt Center for Evidence-Based Medicine

The mission of the VCEBM is to promote understanding and adoption of evidence-based medicine. In Vanderbilt University Medical Center, VCEBM is responsible for coordinating journal clubs and clinical department efforts to adhere to evidence-based practice. In the School of Medicine, it is responsible for classroom instruction and case study assisting students in the development of evidence-based practice core competence. It is also a research center funded through grants from public and private organizations. Recent investigations include the impact of pay for performance programs in increased adherence to evidence-based practices by hospitals and a national study of consumer understanding of evidencebased medicine. Finally, VCEBM conducts workshops for hospitals and medical leaders on optimal ways to achieve clinical transformation through evidence-based practices.

Vanderbilt Center for Stem Cell Biology

The mission of the Vanderbilt Center for Stem Cell Biology is to perform basic research necessary to learn how to produce new cell-based treatments from embryonic stem cells. To do this, it is necessary to first learn more about the biology of stem cells and how to direct their differentiation towards specific fates. The Vanderbilt Center for Stem Cell Biology is home for the Coordinating Center for the Beta Cell Biology Consortium. A major goal of this consortium of scientists is to learn how to make pancreatic beta cells from embryonic stem cells. If achieved, this would provide a new cell-based therapy for the treatment of diabetes.

Vanderbilt Diabetes Center

The Vanderbilt Diabetes Center provides a comprehensive approach to diabetes. Programs dealing with education and training of students and fellows provide the next generation of care givers and scholars. Other programs support the diabetesrelated research of more than eighty VUMC faculty members. Several sophisticated core resources are of particular importance in this regard. Finally, the VDC through the recently established Vanderbilt-Eskind Diabetes Clinic provides comprehensive clinical care, including addressing complications of the disease, for diabetics of all ages.

Vanderbilt-Ingram Cancer Center

The Vanderbilt-Ingram Cancer Center is a National Cancer Institute-designated Comprehensive Cancer Center, one of only forty in the United States to earn this highest distinction from the NCI and the only one in Tennessee that treats patients of all ages. Vanderbilt-Ingram is also a member of the National Comprehensive Cancer Network, an alliance of twenty-one of the world's leading cancer centers that have joined together to improve quality and set the standards for cancer care. The center's nearly 300 researchers and physicianscientists generated more than \$70 million in competitive NCI funding in 2009, ranking the center among the top ten in NCI research funding. Vanderbilt-Ingram is home to three Specialized Programs of Research Excellence (SPOREs) in lung, gastrointestinal, and breast cancer. Its multidisciplinary clinical programs see more than 4,500 new cancer patients each year. Vanderbilt-Ingram offers key programs in lung, breast, genitourinary, gastrointestinal, neurologic, and hematologic malignancies, melanoma, sarcomas, and rare and aggressive cancers, as well as Phase I clinical trials and survivorship care. Vanderbilt is consistently the only center in Tennessee ranked by *U.S. News and World Report* among the nation's best in cancer care.

Vanderbilt Institute of Chemical Biology

The Vanderbilt Institute of Chemical Biology (VICB) is a transinstitutional initiative between the College of Arts and Science and the School of Medicine. The mission of the VICB is to promote research and education in the application of chemistry to important biological problems. Strong basic science programs and outstanding research and clinical centers exist at Vanderbilt that focus on understanding the molecular basis of disease. As these molecular studies increase our understanding, application of the tools of chemistry (e.g., synthesis, analysis, structure-activity) can be used to design and develop new agents to detect, treat, and prevent disease. The VICB operates core facilities in high throughput screening, chemical synthesis, antibody generation, and bioanalytical nuclear magnetic resonance to support these activities, and sponsors major research programs in drug discovery and proteomics.

Vanderbilt Institute for Clinical and Translational Research (VICTR)

The Vanderbilt Institute for Clinical and Translational Research (VICTR) is Vanderbilt's virtual home for clinical and translational research. Supported by the Vanderbilt Office of Research and the NIH-sponsored Clinical and Translational Science Award (CTSA), the mission of the institute is to transform the way ideas and research discoveries make their way from origin to patient care. This is accomplished through collaboration with a wide variety of research partners; by training, nurturing, and rewarding participating researchers; by funding research; by developing new and innovative ways to involve the community in research; by developing new informatics and biostatistical systems; and by making available the latest technologies and sound research results affecting patient care.

VICTR supports many program initiatives including the following:

- VICTR Clinical Research Center (CRC) supports clinical research by providing a controlled environment including inpatient and outpatient adult and pediatric space, laboratories, equipment, supplies, and nursing care. The CRC also serves as a resource for teaching and a site for research in the methodology of patient care systems and apprentice-ship for young clinical investigators.
- VICTR Pilot Funding Program. VICTR and CTSA funds provide support and resources for the generation of pilot and preliminary data. Resources are available following a quick review and approval process, including, but not

limited to, core laboratory services, biostatistical/ethical consultations, informatics support, expert studios, clinical lab services/supplies, in- and outpatient facilities, and nursing care. VICTR resources can supplement funding obtained from other sources. (Federal agencies do not fund inpatient beds or nursing support.

- VICTR Voucher Program provides financial support in the form of "micro-grants" (less than or equal to \$2,000) to enable preliminary work and generation of pilot data on clinical translational research projects. Applicants must describe how the research program has the potential to move from patient observations and laboratory discoveries to the bedside (and ultimately to clinical practice). The submission process is minimal, and requests are typically reviewed within two business days.
- VICTR Clinical and Translational Research Studios. Structured, dynamic sessions bring together relevant research experts in a particular methodology to focus on a specific stage of research. These one-and-a-half-hour sessions are intended to enhance research quality, improve funding success, foster advances in clinical practice and improvements in patient health, increase publications, and generate new hypotheses. A studio consists of two to six experiences faculty selected to participate in a guidance session based on specific areas of research and needs identified by the investigator. Studio types include research hypothesis generation, design, implementation, analysis and interpretation, translation, and manuscript.
- VICTR StarBRITE Portal is an interactive Web-based system that provides researchers and study personnel at Vanderbilt and Meharry with links to resources, experts, regulatory support, templates for research preparation and study conduct, database development software, educational requirements and opportunities, institutional applications, and research approval process support.

Vanderbilt Institute for Integrative Genomics

The Vanderbilt Institute for Integrative Genomics is a transinstitutional initiative to foster use of genomic approaches for understanding the biology of disease. Genomics is the term applied to a broad array of scientific paradigms aimed at determining how the genome of an organism defines its physiological and pathological conditions. The goal of this institute is to harness the full power of genomics by integrating this emerging field with more traditional as well as other new scientific disciplines. The institute strives to bring the science of studying genomes into phase with existing experimental paradigms in developmental biology, vascular biology, cancer biology, genetics, cardiovascular medicine, neuroscience and other fields. This initiative is designed to capitalize on institutional strengths in four specific areas: functional genomics/model organism disease models, cancer genetics, epigenetics/chromatin biology, and computational genetics. Integrative Genomics interfaces strongly with the Zebrafish Initiative funded by the Academic Venture Capital Fund, as well as other existing programs. Goals include strategic faculty recruitment, a seminar series highlighting innovative approaches to obtaining or using genomic information, and support of strategic core facilities to enable cutting-edge research.

Vanderbilt Kennedy Center for Research on Human Development

The mission of the Vanderbilt Kennedy Center for Research on Human Development is to improve the quality of life of persons with disorders of thinking, learning, perception, communication, mood and emotion caused by disruption of typical development. It is dedicated to improving the lives of children and adults with disabilities by embracing core values that include the pursuit of scientific knowledge with creativity and purpose; the dissemination of information to 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 nationally designated National Institutes of Health research center on mental retardation and other development disabilities supported in part by the National Institute of Child Health and Human Development. In 2005, it was designated 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, diagnosis, and treatment institute, embracing faculty and resources available through Vanderbilt University Medical Center, the College of Arts and Science, and Peabody College. The center brings together scientists and practitioners in behavior, education, genetics, and neuroscience to work together in unique ways to solve the mysteries of development and learning.

Vanderbilt University Institute of Imaging Science

The Vanderbilt University Institute of Imaging Science is a university-wide interdisciplinary initiative that brings together scientists whose interests span the spectrum of imaging research—from the underlying physics of imaging techniques to the application of imaging tools to address problems such as understanding brain function. The new Institute has a core program of research related to developing new imaging technology based on advances in physics, engineering, and computer science. The Institute promotes applied research in collaboration with biomedical scientists and physicians who have interesting questions that imaging can address. In addition to high-field MRI and MR spectroscopy in human subjects, the Institute offers state-of-the-art options for small animal imaging.

Women's Reproductive Health Research Center

The Women's Reproductive Health Research Center at Vanderbilt was established in 1999 with principal funding from the National Institute of Child Health and Human Development as part of the Specialized Cooperative Centers Program on Reproduction Research. This center's program was established to promote clinically focused research programs at institutions that possess research strength in both basic science and clinical medicine. At Vanderbilt, the center has developed a program that is broadly focused on the promotion of reproductive health by increasing understanding of normal reproductive biology as well as the dysfunction associated with diseases such as abnormalities of pregnancy, dysfunctional uterine bleeding, endometriosis and cancer. In addition to support from the National Institutes of Health, the center receives substantial support from the Endometriosis Association for an international research and training program in endometriosis research. This training program supports collaborations among basic and clinical scientists within the multi-disciplinary research environment at Vanderbilt with a focus on the care of women with endometriosis and associated diseases. The over-arching goal of the center is to move scientific discoveries of reproductive disease from bench to bedside to improve the health care of women.

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- ADJUNCT PROFESSORS Charles E. Edmiston, Jr., Michael E. Glasscock III, Lewis M. Nashner, Eugene C. Nelson
- CLINICAL PROFESSOR Gary W. Duncan
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Chairs, Professorships, and Lectureships

Endowed Chairs and Professorships

Accenture Chair in the Vanderbilt Center for Better Health Dorothy Beryl and Theodore R. Austin Chair in Pathology Betty and Jack Bailey Professorship in Cardiology Barry and Amy Baker Chair in Laryngeal, Head, and Neck Research Allan D. Bass Chair in Pharmacology Melinda Owen Bass Chair in Medicine Bixler/Johnson/Mays Professor of Psychiatry Blakemore Research Chair in Psychiatry James G. Blakemore Chair in Psychiatry William L. Bray Chair in Urology Frances and John C. Burch Chair in Obstetrics and Gynecology Lucius E. Burch Chair of Reproductive Physiology and Family Planning Betty and Lonnie S. Burnett Chair in Obstetrics and Gynecology Benjamin F. Byrd Jr. Chair in Oncology Ann and Monroe Carell Jr. Family Chair in Pediatric Cardiology Chancellor's Chair in Medicine Dr. Amos Christie Chair in Global Health Sam and Darthea Coleman Chair in Ophthalmology Mark Collie Chair in Diabetes Research Cornelius Abernathy Craig Chair Craig-Weaver Chair in Pediatrics Hertha Ramsey Cress Chair in Medicine Joe C. Davis Chair in Biomedical Science Annette Schaffer Eskind Chair Edward and Nancy Fody Chair in Pathology John Clinton Foshee Distinguished Chair in Surgery Gottlieb C. Friesinger II Chair in Cardiovascular Medicine Thomas F. Frist Sr. Chair in Medicine Ernest W. Goodpasture Chair in Experimental Pathology for Translational Research Mary Phillps Edwards Gray Chair in Stem Cell Biology and Tissue Regeneration Catherine McLaughlin Hakim Chair in Medicine George W. Hale Professorship of Ophthalmology Donna S. Hall Chair in Breast Cancer Paul V. Hamilton M.D. Chair in Geriatrics Paul V. Hamilton M.D. and Virginia E. Howd Chair in Urologic Oncology

Elsa S. Hanigan Chair in Pulmonary Medicine Joel G. Hardman Chair in Pharmacology Patricia and Rodes Hart Chair in Urologic Surgery Ingram Chair in Surgical Sciences Ingram Professorships in Cancer Research E. Bronson Ingram Chair in Pediatric Oncology Hortense B. Ingram Chair in Cancer Research Lisa M. Jacobson Chair in Cardiovascular Medicine Rudy W. Jacobson Chair in Pulmonary Medicine David T. Karzon Chair in Pediatrics Krick-Brooks Chair in Nephrology Janie Robinson and John Moore Lee Chair in Pediatrics Grant W. Liddle Scholar Fund Lee E. Limbird Chair in Pharmacology Guy M. Maness Chair in Laryngology and Voice Guy M. Maness Chair in Otolaryngology Jeffrey W. Mast Chair in Orthopaedics Trauma and Hip Surgery Dan May Chair Katrina Overall McDonald Chair in Pediatrics McKesson Foundation Chair in Biomedical Informatics William F. Meacham Chair in Neurological Surgery Stanford Moore Chair in Biochemistry Hugh J. Morgan Chair in Medicine Harold L. Moses Chair in Cancer Research Elizabeth and John Murray Chair in Medicine John A. Oates Chair in Translational Medicine Carol and John S. Odess Chair in Facial Plastic and Reconstructive Surgery James C. Overall Chair in Pediatrics Ralph and Lulu Owen Chair in Medicine Harry and Shelley Page Chair in Interventional Cardiology Carol D. and Henry P. Pendergrass Chair in Radiology Carolyn Perot Rathjen Chair in Pediatric Hematology and Oncology Ann and Roscoe R. Robinson Chair in Nephrology Ann and Roscoe R. Robinson Professorship of Clinical Research at the **Diabetes** Center David E. Rogers Professorship Paul W. Sanger Chair for Experimental Surgery John L. Sawyers Chair in Surgical Sciences Kenneth Schermerhorn Chair in Orthopaedics and Rehabilitation H. William Scott, Jr. Chair in Surgery Addison B. Scoville, Jr. Chair in Medicine Ruth King Scoville Chair of Medicine John L. Shapiro Chair in Pathology

Mark C. Smith Chair in Otolaryngology/Head and Neck Surgery Phyllis G. and William B. Snyder M.D. Chair in Ophthalmology and Visual Sciences Julia Carell Stadler Chair Ann Geddes Stahlman Chair in Medical Ethics Edward Claiborne Stahlman Chair in Pediatric Physiology and Cell Metabolism Gladys Parkinson Stahlman Chair in Cardiovascular Research Gray E. B. Stahlman Chair in Neurosciences Major E. B. Stahlman Chair in Infectious Diseases and Inflammation Mary Geddes Stahlman Chair in Cancer Research William Stokes Chair in Experimental Therapeutics William S. Stoney Jr. Chair in Cardiac and Thoracic Surgery Jacquelyn A. Turner and Dr. Dorothy J. Turner Chair in Diabetes Research Jim Turner Chair in Cognitive Disorders John B. Wallace Chair in Medicine Mina Cobb Wallace Chair in Immunology Natalie Overall Warren Distinguished Chair in Biochemistry William C. Weaver III Chair in Neurology Dorothy Overall Wells Chair in Pediatrics Albert and Bernard Werthan Chair in Medicine Lester and Sara Jane Williams Chair in Academic Surgery Anne Potter Wilson Chair

Elton Yates Professorship in Autonomic Disorders

Annually Funded Chairs and Professorships

Oswald T. Avery Distinguished Chair in Microbiology F. Tremaine Billings Professorship in Medicine and Pharmacology Harry Pearson Broquist Professorship in Biochemistry C. Sidney Burwell Professorship in Medicine Stanley Cohen Professorship in Biochemistry John Coniglio Chair in Biochemistry Marion Wright Edelman Professor of Pediatrics Rosalind E. Franklin Professorship in Genetics and Health Policy Godfrey Hounsfield Chair in Radiology and Radiological Sciences Rudolph H. Kampmeier Associate Professor (Medicine) Donald A. B. and Mary M. Lindberg University Professor of Biomedical Informatics Cesar Milstein Associate Professor of Pediatrics T. H. Morgan Professorship in Human Genetics

Elliott V. Newman Professorship in Medicine

Wilhelm Roentgen Professor of Radiology and Radiological Sciences

T. Edwin Rogers Chair in Pharmacology

Joseph C. Ross Chair in Medical Education and Administration

Sarah H. Sell Chair in Pediatrics Norman Ty Smith Chair in Patient Safety and Medical Simulation Earl W. Sutherland Jr. Professorship in Pharmacology Earl W. Sutherland Jr. Chair in Molecular Physiology and Biophysics Levi Watkins, Jr. Professorship for Diversity in Medical Education Robert H. Williams Professorship in Medicine John B. Youmans Professor of Medicine

Ronald E. Santo Chair in Diabetes Research

Committed Chairs

R. Benton Adkins Jr. Chair in General Surgery Dr. Ben J. Alper Chair in Rheumatology Fred H. Bess Chair in Audiology Robert and Rachelle Buchanan/A. H. and Lucile Lancaster Chair in Dermatology Martha O. and Dixon N. Burns Chair in Medical Ethics Gerald M. Fenichel Professorship in Neurology Edward and Nancy Fody Chair in Pathology Thomas P. Graham Jr. Chair in Pediatric Cardiology Dorothy and Laurence A. Grossman Chair in Cardiology Donna S. Hall Chair in Breast Cancer Patricia and Rodes Hart Chair in Urologic Surgery Ingram Professorship in Pediatric Oncology Ann Light Chair in Pulmonary Medicine John N. Lukens Jr. Chair in Pediatric Hematology-Oncology Jack Martin M.D. Research Professorship in Psychopharmacology Mildred Thornton Stahlman Chair in Perinatology

Margaret and John Warner Chair for Neurological Education

Lectureships

THE JOHN Q. ADAMS LECTURESHIP IN OTOLARYNGOLOGY. Through the generosity of the Adams family this annual lecture furthers education in otolaryngology.

THE ALPHA OMEGA ALPHA LECTURE. The Alpha Omega Alpha Medical Honor Society each year invites a scientist of prominence to deliver a lecture before the students and faculty and members of the medical community. The first lecture was given during the school year 1926/27.

THE ALLAN D. BASS LECTURESHIP. This lectureship was established in 1976 in recognition of Dr. Bass's outstanding contributions to Vanderbilt University, the Nashville community, and the field of Pharmacology. He served as a professor and chairman of the Department of Pharmacology from 1953 to 1973, as associate dean for biomedical sciences from 1973 to 1975, and as acting dean of the School of Medicine from 1973 to 1974. The lectureship is made possible through the generosity of his associates and colleagues in the American Society of Pharmacology and Experimental Therapeutics; the FASEB; the AMA Council on Drugs; the Nashville Academy of Medicine; the present and former staff, students, and faculty members at Vanderbilt University; and the Department of Pharmacology. The first lecture was given in April 1977. THE ROBERT N. BUCHANAN JR. VISITING PROFESSORSHIP IN DER-MATOLOGY. The Department of Medicine established in 1980 a visiting professorship to honor Dr. R. N. Buchanan, Jr., professor emeritus and former chairman of the Division of Dermatology. Each year, a distinguished dermatologist is invited to come to Vanderbilt to deliver a series of formal lectures and participate in teaching conferences.

THE BARNEY BROOKS MEMORIAL LECTURESHIP IN SURGERY. In 1952, through the generosity of a Vanderbilt alumnus, an annual lectureship was established to honor the memory of Dr. Barney Brooks, formerly professor of surgery and head of the department, and surgeon-in-chief of Vanderbilt University Hospital. As a fitting memorial to Dr. Brooks, these lectures have been given by physicians who have made distinguished contributions in clinical or investigative surgery.

THE GEORGE DANIEL BROOKS LECTURESHIP IN ONCOLOGY. Established and endowed in 1991 by Frances Brooks Corzine in honor of her father, G. Daniel Brooks, who died of cancer. The focus of the lectureship is oncology and rotates between clinical and basic cancer distinguished lecturers.

THE JOHN E. CHAPMAN LECTURESHIP IN THE ECOLOGY OF MEDI-CINE AND MEDICAL EDUCATION. Established by Richard E. Strain, M.D. '75, in memory of his father, Richard E. Strain, Sr., M.D. '35, and honoring Dr. John E. Chapman, former Dean of Vanderbilt University School of Medicine. The annual lecture will be devoted to subjects that address the changing role of medicine in our culture.

THE CULLY COBB LECTURESHIP IN NEUROLOGICAL SURGERY. This fund is used exclusively to cover expenses for speakers at the regular meetings of the Meacham Society. Dr. Meacham (M.D. '40) was chairman of the Department of Neurosurgery from 1954 to 1984. Dr. Cobb is a clinical professor of neurological surgery.

THE W. ANDREW DALE MEMORIAL LECTURESHIP. Established by the Dale family and friends, this first lecture in vascular surgery supports the advancement of vascular education, research, and patient care. The lecture reflects the depth of Dr. Dale's commitment to Vanderbilt Medical School and vascular surgery.

THE ROLLIN A. DANIEL JR. LECTURE IN THORACIC SURGERY. In 1977, the Department of Thoracic and Cardiac Surgery established the Rollin A. Daniel Jr. Lecture as a tribute to Dr. Daniel. Since Dr. Daniel's death, there has been generous support from Dr. Daniel's family and many former residents to this lectureship fund. Each year a distinguished thoracic surgeon is invited by the Department to visit Vanderbilt and deliver the annual lecture, usually in the fall.

DEAN'S LECTURE SERIES. The Dean's Lecture Series provides a forum for nationally recognized speakers to enrich the educational environment by providing insight into topics that are important to the science and art of medicine. Supported by the Dean's Office and facilitated by the students of VUSM, this series is intended to stimulate thought, curiosity, and enthusiasm about the challenges, controversies, and complexities of medicine and biomedical science.

DISCOVERY LECTURE SERIES. In 2006, the medical center launched its new Vanderbilt Discovery Lecture Series. Held twice each month, this series features the world's most eminent scientists, as well as Vanderbilt's own top researchers, who speak on the highest-impact research and policy issues in science and medicine today. The series kicked off in September with Sydney Brenner, Ph.D., who won the Nobel prize in Physiology or Medicine in 2002 for his discoveries in genetic regulation of organ development and programmed cell death. Lecture topics cover the spectrum of research areas, from pharmacology and cell and developmental biology to pediatrics and global health.

THE LEONARD W. EDWARDS MEMORIAL LECTURESHIP IN SURGERY. This annual lectureship was established in 1972 by the family and friends of Dr. Leonard Edwards, who was a professor of clinical surgery, in recognition of his more than fifty years of contributions to Vanderbilt and the Nashville community as a distinguished surgeon and teacher. The first lecture was given in 1972 by Dr. Lester Dragstedt.

THE PHILIP W. FELTS LECTURE SERIES IN THE HUMANITIES. This lecture series was established to honor Dr. Felts's dedication to medical students and his desire to help them develop as individuals as well as physicians. Funding in his memory comes primarily from former students and his own Vanderbilt classmates and friends as well as Vanderbilt faculty members. It allows medical students to invite a nationally recognized figure in the humanities to speak at the School of Medicine each year as part of the annual student-run humanities series. He was director of alumni affairs when he died in 1992.

THE ABRAHAM FLEXNER LECTURESHIP. In the fall of 1927, Mr. Bernard Flexner of New York City donated \$50,000 to Vanderbilt University to establish the Abraham Flexner Lectureship in the School of Medicine. This lectureship is awarded every two years to a scientist of outstanding attainments who shall spend as much as two months in residence in association with a department of the School of Medicine. The first series of lectures was given in the fall of 1928.

THE LEROY BRUNSON GEORGE JR. LECTURESHIP IN TRANSPLANTA-TION. This lecture was provided by his mother, in tribute to his brave spirit in facing unprecedented heart surgery in 1956, which resulted in his death.

THE ALVIN F. GOLDFARB LECTURESHIP IN REPRODUCTIVE ENDO-CRINOLOGY. Established by the children of Dr. Goldfarb to honor their father, an alumnus of Vanderbilt University School of Medicine, this is the first named lectureship in the Center for Fertility and Reproductive Research. Serving as an important forum for continuing education, the lectureship enables the Vanderbilt medical community to learn from those at the cutting edge of research and practice in reproductive biology.

THE ERNEST W. GOODPASTURE LECTURE. In 1968 the Goodpasture Lecture was established by a friend of Vanderbilt University and of the Department of Pathology, Mrs. George M. Green, Jr. The lecture is to honor the memory of Dr. Ernest William Goodpasture, distinguished chairman of the Department of Pathology from 1925 until his retirement in 1955. Each year, a lecturer prominent for achievements in research or in medical education is selected. The first lecture was given in the fall of 1971.

THE THOMAS P. GRAHAM, JR. LECTURE IN PEDIATRICS. The Department of Pediatrics and the Division of Pediatric Cardiology established this lecture to recognize Dr. Graham as a renowned clinician and teacher.

THE A. R. GLENN GREENE LECTURESHIP IN CARDIOVASCULAR MED-ICINE. This fund was established in 2008 to pay tribute to Dr. R. Glenn Greene's career in medicine and his longstanding commitment to Vanderbilt's Division of Cardiovascular Medicine. The lectureship will support an annual speaker in cardiology, with a preference given to echo.

THE J. LYNWOOD HERRINGTON LECTURESHIP IN GENERAL SURGERY. St. Thomas Hospital administers this fund for the exclusive use of surgical grand rounds, speakers, and lectures. It is in honor of Dr. Herrington, clinical professor of surgery, emeritus.

THE J. WILLIAM HILLMAN VISITING PROFESSORSHIP. This professorship was established in 1976 as a tribute to the late Dr. J. William Hillman, who served as professor and chairman of the Department of Orthopaedics. To commemorate Dr. Hillman's tireless dedication to the art of teaching, the department annually invites a prominent orthopaedist to spend three or four days in residence teaching the house staff through a series of walking rounds and informal talks, concluding with a day-long seminar on special topics in the field.

THE GEORGE W. HOLCOMB JR. LECTURESHIP IN PEDIATRIC SUR-GERY. This lectureship was established in 1990 in tribute to George Whitfield Holcomb, M.D., clinical professor of pediatric surgery, emeritus, for his many contributions as a pediatric surgeon and teacher from 1952 to 1989. The lectureship will keep pediatric surgeons at Vanderbilt abreast of new clinical procedures and research discoveries in the field of pediatrics by inviting guest lecturers from all over the country to give presentations.

THE MARC H. HOLLENDER LECTURESHIP IN PSYCHIATRY. This fund is used by the Department of Psychiatry for an annual lecture honoring the memory of its former chairman, Dr. Marc H. Hollender.

THE BOEHRINGER INGELHEIM DISTINGUISHED LECTURESHIP IN BIO-MEDICAL SCIENCES. This lectureship was established by the Boehringer Ingelheim Pharmaceutical Company in 1992 as an annual lecture. The lectureship was given in tribute to the strength of basic biomedical sciences at Vanderbilt University Medical Center. The focus of two lectures given by the distinguished lecturer is on a fundamental research area of broad and dramatic impact on the biomedical sciences.

THE VANDERBILT-INGRAM CANCER CENTER ORRIN INGRAM DISTIN-GUISHED LECTURE SERIES. Established in 2004. Each year, this program typically recruits four esteemed scientists to deliver lectures at Vanderbilt-Ingram Cancer Center. The series was designed to stimulate ideas, enhance communications and collaborations between Vanderbilt-Ingram members and their peers, and expose Vanderbilt-Ingram physicians and scientists to some of the most promising cancer research and programs taking place in the world today.

THE EVERETTE JAMES JR. LECTURESHIP IN RADIOLOGY AND RA-DIOLOGICAL SCIENCES. Established by friends and colleagues of Dr. James, former chairman of the Department of Radiology and Radiological Sciences, this lectureship brings internationally known experts in a variety of areas of diagnostic radiology to Vanderbilt annually.

THE CONRAD JULIAN MEMORIAL LECTURE. This lecture was instituted in 1980 in honor of Dr. Conrad G. Julian, the first director of gynecologic oncology at Vanderbilt University Hospital. The lecture is delivered each year on a subject related to gynecologic oncology and is given in conjunction with the annual Gynecologic Oncology Seminar.

THE PAULINE M. KING MEMORIAL LECTURESHIP. This lectureship was established in 1962 by Mr. Robert F. King of Klamath River, California, as a memorial to his wife. Each year, a distinguished thoracic or cardiovascular surgeon is invited to lecture by the Department of Surgery. The first Pauline M. King Memorial Lecture was given in the spring of 1963.

THE HOWARD S. KIRSHNER LECTURESHIP IN NEUROLOGY. This lectureship was established by Arlin Adams, Dr. Howard S. Kirshner's fatherin-law, to honor Dr. Kirshner's 60th birthday and as a tribute to his longstanding career as a neurologist.

THE LEONARD J. KOENIG LECTURESHIP IN MEDICINE. This fund, established in 1977 and named for longtime Nashville pediatrician Dr. Leonard Koenig, is for lectures and seminars within the Department of Medicine.

THE M. GLENN KOENIG VISITING PROFESSORSHIP IN INFECTIOUS DISEASES. This visiting professorship was established in 1973 through the generosity of alumni, faculty, friends, and the family of the late Dr. M. Glenn Koenig who served as a professor of medicine and head of the Division of Infectious Diseases. In recognition of Dr. Koenig's unexcelled ability to teach at the bedside, the Department of Medicine invites physicians of unusual competence in the teaching of clinical infectious diseases to join the Division of Infectious Diseases for short periods to spend time on the wards and in discussions with students, house staff, fellows, and faculty. The first visiting professorship was held in 1973.

THE KROC FOUNDATION LECTURESHIP IN MOLECULAR PHYSIOLOGY AND BIOPHYSICS. Established in 1986 by the Kroc Foundation in honor of Ray A. Kroc and Robert L. Kroc to support several visiting professors each year. These individuals present a state-of-the-art lecture on diabetes, insulin action, or a related endocrine topic and consult with faculty members and their groups.

THE ELIZABETH B. LAMB LECTURESHIP IN MICROBIAL PATHOGEN-ESIS. Through the generosity of Elizabeth B. Lamb and family, income from the Lamb Center for Pediatric Infectious Diseases Research Endowment contributes to funding this annual lecture which brings an expert in the field to campus to expand professional education regarding infectious diseases research in children.

THE PAUL DUDLEY LAMSON MEMORIAL LECTURE. This lectureship was instituted in 1965 in memory of Dr. Lamson, professor of pharmacology and chairman of the department from 1925 until his retirement in 1952. A prominent scientist is brought to the campus biennially under the sponsorship of the alumni and staff of the Department of Pharmacology. THE JOHN LEONARD LECTURESHIP IN MEDICINE. This fund was established by friends and colleagues of Dr. John Leonard to honor his more than twenty-five years of service as the Director of House Staff Education in the Department of Medicine.

THE LILY'S GARDEN ENDOWED LECTURE IN CHILDHOOD CANCER. In December 2008, Lily Hensiek, daughter of Larisa and Steven and granddaughter of Carol and Ron Johnston, was diagnosed with Pre-B acute lymphocytic leukemia. Lily's diagnosis led to the creation of Lily's Garden, a foundation committed to "weeding out leukemia" by providing funding for pediatric cancer research. The endowment will be used to provide support so that, each year, an international expert in childhood cancer will visit Vanderbilt for one week, give a research seminar, do grand rounds, and spend the week teaching and rounding with the fellows and faculty.

THE FRANK H. AND MILBREY LUTON LECTURESHIP. Established in 1976 through the generosity of friends and former students, this lectureship honors Dr. Frank H. Luton, the first psychiatrist on the Vanderbilt faculty. Each year, a prominent lecturer in the field of psychiatry is selected.

THE MARTHA E. LYNCH LECTURESHIP. The Martha E. Lynch Lectureship is an annual series of lectures presented by the Vanderbilt Bill Wilkerson Center and is designed to provide continuing education to speech-language pathologists working in the public school system. The lectureship is named in honor of Martha E. Lynch, a speech-language pathologist who has devoted her thirty-year career to children with communication disabilities.

THE DAN MAY LECTURE. Made possible by a gift from the May family, this lecture series honors Mr. May, a Nashville business, educational, and civic leader who was a Vanderbilt graduate, long-time Board of Trust member, and friend of the University. The lecturer is a distinguished scholar of medicine or another discipline with expertise in cardiovascular disease, medical education, or humanistic aspects of medicine.

THE PATRICIA TOWNSEND MEADOR LECTURE IN LAW, ETHICS, AND HEALTH CARE. This gift is to honor the memory of Patricia Townsend Meador (B.S.N. '78, J.D., M.P.H.). Mrs. Meador was a wise counselor and had a gift for interpreting complex issues and advising health care leaders and systems. A lectureship in law, ethics, and health care will promote her vision by educating future fenerations of health care professionals about the ethical issues they face every day in health care delivery.

THE GLENN A. MILLIKAN MEMORIAL LECTURE. This lectureship was established in 1947 in memory of Dr. Millikan, professor of physiology, by members of the then second-year class. It has subsequently received support by means of a capital fund by Dr. Millikan's father and mother, Dr. Robert A. Millikan and Mrs. Gretna B. Millikan, and friends. Contributions have been made to the fund by members of the founding class and other students. The lectureship is maintained to provide a distinguished lecturer in physiology.

THE MEREDITH AND JOHN OATES LECTURESHIP. This lectureship was established in the John A. Oates Institute in Experimental Therapeutics within the Department of Medicine in 2006 through the generosity of a small group of friends and patients. This tribute honors Dr. Oates' leadership and Mrs. Oates' personal commitment to the pursuit of excellence at Vanderbilt by inviting outstanding speakers to Vanderbilt Medical Center to present scientific talks in areas related to Dr. Oates' prestigious research.

THE WILLIAM F. ORR LECTURESHIP. This annual lectureship was established in 1976 through the generosity of Hoffman-LaRoche, Inc., in honor of Dr. William F. Orr, first professor and chairman of the Department of Psychiatry, a position he held from 1947 to 1969. A psychiatrist of national prominence is invited each year to present the lecture and to participate in various teaching conferences in the Department of Psychiatry.

THE FRED D. OWNBY LECTURESHIP IN CARDIOLOGY. This lectureship was established in 1996 as a tribute to Dr. Fred D. Ownby's contributions to the field of cardiology, his passion for education, and his commitment to the people of Middle Tennessee. Presented annually by a visiting professor, researcher, or clinician of national renown, the lectures, seminars, and teaching rounds address the latest advances in research, technology, and treatment of cardiovascular illnesses.

THE JAMES M. PHYTHYON M.D. MEMORIAL LECTURESHIP IN PEDIAT-RIC ANESTHESIOLOGY. The family of James Phythyon, M.D., in conjunction with the Department of Anesthesiology, honored Dr. Phythyon's years of service and commitment to the field of pediatric anesthesiology with this lasting gift intended for programmatic initiatives.

THE COBB PILCHER MEMORIAL LECTURE. In 1950, the Pi Chapter of the Phi Chi Medical Fraternity established the Cobb Pilcher Memorial Lecture to honor the memory of Dr. Pilcher, formerly associate professor of surgery, distinguished neurosurgeon, and a member of Phi Chi fraternity. Each year a lecturer of prominence is selected. The first lecture was given in 1950.

THE DAVID RABIN LECTURE IN ENDOCRINOLOGY. The Department of Medicine established in 1980 a visiting lectureship in recognition of the salient contributions of Dr. David Rabin to the world of endocrinology. Dr. Rabin was a professor of medicine and head of the Division of Endocrinology from 1975 until his death in 1984. This lectureship annually brings to Vanderbilt a world leader in the science of endocrinology and the application of that science to the solution of the problems of humankind.

THE SAMUEL S. RIVEN VISITING PROFESSORSHIP. This professorship was established in 1989 to honor Dr. Samuel Riven for more than fifty years of service to his patients and the Department of Medicine at Vanderbilt University. A physician of prominence is invited each year to present a lecture and to participate in various teaching conferences in the Department of Medicine.

THE ROSCOE R. ROBINSON M.D. LECTURESHIP. Dr. Robinson was an internationally recognized nephrologist and educator who, as the Vice Chancellor for Health Affairs, led VUMC through a period of tremendous growth and change during the 1980s and 1990s. The Robinson Lectureship was a gift from the School of Medicine faculty to celebrate the vice chancellor's years at Vanderbilt.

THE JOSEPH C. ROSS M.D. LECTURESHIP IN EMERGENCY MEDICINE. The Ross Lectureship is the first endowed lectureship in emergency medicine and was established by Dr. Ross, his family, and other supporters.

THE W. D. SALMON LECTURESHIP IN THE DIVISION OF GASTROEN-TEROLOGY. Honoring William D. Salmon, Jr. (M.D. '49 and professor of medicine, emeritus), this annual lecture series brings a visiting professor to campus to discuss topics in the field of gastroenterology.

THE DOLORES SHOCKLEY LECTURESHIP AND AWARD IN PHAR-MACOLOGY. Dolores Shockley was the first African American woman to receive a Ph.D. from Purdue University, the first to receive a Ph.D. in pharmacology in the United States, and the first to chair a pharmacology department (Meharry Medical College). To recognize their remarkable colleague and her achievements, Lee and Tom Limbird endowed this lectureship and award in her honor. At the time of each biennial lectureship, recipients of the Dolores Shockley Award will be recognized for their contributions advancing diversity in biomedical research and training.

THE HARRISON J. SHULL LECTURESHIP IN THE DIVISION OF GAS-TROENTEROLOGY. This lectureship honors the memory of the late Dr. Harrison J. "Hack" Shull, Sr. (M.D. '34), the first physician to specialize in gastroenterology in Middle Tennessee. He started Vanderbilt's Division of Gastroenterology in the 1950s.

THE NORMAN E. SHUMWAY JR. LECTURESHIP IN TRANSPLANTATION. This lectureship was established in 1991 to recognize the contributions and leadership of Dr. Shumway, a 1949 graduate of Vanderbilt University School of Medicine, in pioneering transplantation research, education, and patient care.

THE R. TURNER SIMPSON LECTURESHIP IN THE HISTORY OF MEDI-CINE. This lectureship was made possible by the generous contributions of John W. Simpson, M.D., Vanderbilt School of Medicine class of 1932, and his wife. The late Dr. Turner Simpson, brother of Dr. John W. Simpson, was also a Vanderbilt graduate. This lectureship will bring prominent figures in the field of medical history to Vanderbilt. THE DRS. WILLIAM S. AND GRACE R. SNYDER LECTURESHIP IN OPH-THALMOLOGY. Established in 1983 by Phyllis and William B. Snyder, M.D. '57, the Snyder Lectureship honors Dr. Snyder's parents, both of whom practiced medicine in Kentucky. The lectureship is in the Department of Ophthalmology and Visual Sciences.

THE PAUL STERNBERG SR. LECTURESHIP. The Paul Sternberg Sr. Lectureship was established in 2004 by Dr. and Mrs. Paul Sternberg and family in memory of his father, an innovative and skilled ophthalmic surgeon.

THE EARL W. SUTHERLAND LECTURESHIP IN THE DEPARTMENT OF MOLECULAR PHYSIOLOGY AND BIOPHYSICS. In 1999, this lectureship was established to honor the memory of former Vanderbilt professor and Nobel Laureate Earl W. Sutherland.

THE PAUL TESCHAN LECTURESHIP IN THE DIVISION OF NEPHROL-OGY AND HYPERTENSION. This lectureship was established in 1990 by colleagues of Dr. Teschan, professor of medicine, emeritus. Its purpose is to bring the world's outstanding leaders in nephrology to Vanderbilt to provide the Division of Nephrology with special occasions of stimulation and professional enrichment.

THE CHARLES J. THUSS SR., GERTRUDE NOBLE THUSS, CHARLES J. THUSS JR., AND CARTER THUSS LECTURESHIP IN PLASTIC AND RE-CONSTRUCTIVE SURGERY. This lectureship was established in 1977 by Dr. Charles J. Thuss, Jr., medical class of 1961, of San Antonio, Texas, in honor of his parents. The lectureship is funded in collaboration with the Department of Plastic Surgery for the purpose of bringing distinguished lecturers in the field of plastic and reconstructive surgery to the Vanderbilt campus.

THE "UNIT S" OTOLARYNGOLOGY LECTURESHIP. This lectureship was established in 1994 through the leadership and generosity of Dr. William G. Kennon, Jr., and other descendants of the Vanderbilt University School of Medicine team which served during World War I.

THE VANDERBILT UROLOGY SOCIETY VISITING PROFESSORSHIP AND RHAMY-SHELLEY LECTURE. This annual visiting professorship and lectureship was established in 1972 through the efforts of former residents in urology at Vanderbilt University Medical Center. An outstanding urologist, from either the United States or abroad, is invited to spend four or five days as a visiting professor in the Department of Urology, to join with former residents and other urologists in demonstrations of surgical technique and diagnostic acumen, as well as in a series of conferences and lectures. The activities conclude with a formal lecture which honors Dr. Robert K. Rhamy, who was chairman of the Department of Urology at Vanderbilt from 1964 to 1981, and Dr. Harry S. Shelley, former chief of the Division of Urology at Nashville Veterans Administration Hospital.

THE LEVI WATKINS JR. LECTURE ON DIVERSITY IN MEDICAL EDUCA-TION. This lectureship is established to recognize Dr. Watkins, the first African American graduate of the Vanderbilt University School of Medicine in 1970. It is established to support efforts to increase diversity in medical and graduate education.

THE ALBERT WEINSTEIN LECTURESHIP IN DIABETES. This lectureship was established as a tribute to the late Dr. Albert Weinstein by his wife, Miriam, and family members. Dr. Weinstein was born in Middlesboro, Kentucky, in 1905 and received his A.B. degree from Vanderbilt University in 1926. Three years later, he graduated as Founder's Medalist from Vanderbilt University School of Medicine. Following his residency training at Johns Hopkins, he moved to Nashville to begin his medical practice in internal medicine at Vanderbilt, where he served as a clinical professor for more than three decades. Recognized for his remarkable insight into the treatment of his patients, he was also an avid reader and publisher, credited for more than forty scientific papers on a wide array of subjects, including diabetes, cardiology, and hypertension.

THE MARY JANE AND ALBERT WERTHAN VISITING LECTURESHIP IN DERMATOLOGY. This lectureship was established by the Werthans in 1997 in honor of Dr. Lloyd King, Chairman of the Division of Dermatology at Vanderbilt University Medical Center. The named lectureship will bring

topflight physician-scientists to Vanderbilt annually to discuss advances in the diagnosis, treatment, and causes of skin lymphoma and other types of skin cancers.

THE JOHN D. WHALLEY CHILD LANGUAGE LECTURESHIP. The John D. Whalley Child Language Lectureship is an annual lecture presented by the Vanderbilt Bill Wilkerson Center, featuring internationally recognized researchers in the area of child language disorders. The lectureship is a tribute to the late John Donelson Whalley, one of the influential forces behind the development of the Scottish Rite Masons Research Institute for Communication Disorders at the Bill Wilkerson Center.

THE GRANT WILKINSON LECTURESHIP IN CLINICAL PHARMACOLOGY. Friends and colleagues established this fund to pay tribute to the illustrious career of Dr. Wilkinson and to bring international leadership in clinical pharmacology to campus each year. This lectureship exposes both current and future students and faculty to the best of contemporary pharmacological science.

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Psychology, Peabody College; Professor of Pediatrics; Professor of	WILLIAM H. EDWARDS, JR., Associate Clinical Professor of Surgery at
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