

Bulletin of
Duke University



School of Medicine
2015-2016

The Mission of Duke University

James B. Duke's founding Indenture of Duke University directed the members of the University to "provide real leadership in the educational world" by choosing individuals of "outstanding character, ability and vision" to serve as its officers, trustees and faculty; by carefully selecting students of "character, determination and application;" and by pursuing those areas of teaching and scholarship that would "most help to develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to promote an intellectual environment built on a commitment to free and open inquiry; to help those who suffer, cure disease and promote health, through sophisticated medical research and thoughtful patient care; to provide wide ranging educational opportunities, on and beyond our campuses, for traditional students, active professionals and life-long learners using the power of information technologies; and to promote a deep appreciation for the range of human difference and potential, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the University; to contribute in diverse ways to the local community, the state, the nation and the world; and to attain and maintain a place of real leadership in all that we do.

Adopted by the Board of Trustees on February 23, 2001.

Bulletin of
Duke University

School of Medicine

2015-2016

Editor

Marcie Ellis

Coordinating Editor

Sarah Kibler

Publications Coordinator

Bahar Rostami

Academic Liaison

Stacey R. McCorison

Lori Crooks

Photographs

Marcie Ellis, Steve Wilson, and Robert Benson Photography

The information in this bulletin applies to the academic year 2015-2016 and is accurate and current, to the greatest extent possible, as of June 2015. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

Duke University does not tolerate discrimination or harassment of any kind. Duke University has designated Dr. Benjamin Reese, vice-president for institutional equity, as the individual responsible for the coordination and administration of its nondiscrimination and harassment policies generally. The Office for Institutional Equity is located in Smith Warehouse, 114 S. Buchanan Blvd., Bay 8, Durham, NC 27708. Dr. Reese's office telephone number is (919) 684-8222 and his e-mail address is ben_reese@duke.edu. Sexual harassment and sexual misconduct are forms of sex discrimination and prohibited by the university. Duke University has designated Howard Kallem as its director of Title IX compliance and Age Discrimination Act coordinator. He is also with the Office for Institutional Equity and can be contacted at (919) 684-1437 or howard.kallem@duke.edu.

Questions or comments about discrimination, harassment, domestic violence, dating violence, and stalking can be directed to the Office for Institutional Equity, (919) 684-8222. Additional information, including the complete text of the discrimination grievance procedure and the harassment policy and appropriate complaint procedures, may be found by contacting the Office for Institutional Equity or visiting its website at <http://www.duke.edu/web/equity>. Questions or comments about sex-based and sexual harassment and misconduct, domestic violence, dating violence, and stalking committed by a student may also be directed to the Office of Student Conduct at (919) 684-6938. Additional information, including the complete text of the policy and complaint procedure for such misconduct, may be found at <http://studentaffairs.duke.edu/conduct/z-policies/student-sexual-misconduct-policy-dukes-commitment-title-ix>.

Duke University recognizes and utilizes electronic mail as a medium for official communications. The university provides all students with e-mail accounts as well as access to e-mail services from public clusters if students do not have personal computers of their own. All students are expected to access their e-mail accounts on a regular basis to check for and respond as necessary to such communications.

Information that the university is required to make available under the federal Clery Act is available by visiting the Records Division, Duke University Police Department, 502 Oregon Street, Durham, NC 27708, or by calling (919) 684-4602. See http://duke.edu/police/news_stats/clery/index.php for more details.

The Family Educational Rights & Privacy Act (FERPA), 20 U.S.C § 1232g; 34 CFR Part 99, is a federal law that guides the release of students' education records, of which disciplinary records are a part. For additional information about FERPA, see <http://www.ed.gov/policy/gen/guid/fpc/ferpa/index.html>

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award baccalaureate, masters, doctorate, and professional degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097 or call (404) 679-4500 for questions about the accreditation of Duke University.

Contents

University Administration	8
History	14
History of Duke University	21
Doctor of Medicine Program	22
Admission Procedures	24
Financial Information and Tuition and Fees	27
Financial Aid Program	32
Doctor of Medicine Program Policies	38
Policies for All School of Medicine Programs	55
Immunization Requirements	62
Student and Professional Organizations	62
Academic Calendar—MD Program	65
Doctor of Medicine Degree	71
Dual Degree Programs	76
Courses of Instruction	85
Anesthesiology	85
Clinical Core	87
Community and Family Medicine	87
Dermatology	91
Free Time	91
Medicine	96
Neurology	107
Neurosurgery	109
Obstetrics and Gynecology	110
Ophthalmology	111
Orthopaedics	112
Pathology	113
Pediatrics	114
Psychiatry	120
Radiation Oncology	122
Radiology	123
Study Away	125
Surgery	125
Basic Science Departments	131
Biochemistry	131
Biostatistics and Bioinformatics	131
Cell Biology	132
Immunology	132
Molecular Genetics & Microbiology	132
Neurobiology	132
Pharmacology and Cancer Biology	132
Thesis	133
Special Interdisciplinary Training Programs	133
Doctor of Physical Therapy	143
DPT Faculty	144
The Profession of Physical Therapy	144
Mission Statement of the Doctor of Physical Therapy Division	144

Doctor of Physical Therapy Program	144
Admissions	144
Criminal Background Check Policy	146
Drug Screen Policy	147
Tuition and Expenses	147
Financial Aid	147
Code of Professional Conduct	147
Standards of Academic Conduct and Examinations	147
Health Insurance	148
Computer and Technology	148
Doctor of Physical Therapy Academic Progression	148
Program of Study	152
Academic Calendar	154
Courses of Instruction	155
Master of Biomedical Sciences	162
Academic Calendar	164
Financial Information	164
Health Insurance	165
Computer Technology	165
Criminal Background Check/Drug Screening Policy	165
Immunization and Health Record	166
Academic Regulations	166
Grading	167
Code of Professional Conduct	168
Satisfactory Academic Progress	169
Graduation	169
Program of Study	169
Courses of Instruction	169
Master of Biostatistics Program	172
Program of Study	173
Program Admission	173
Academic Calendar	174
Curriculum Overview	175
Academic Regulations	176
Code of Professional Conduct	178
Tuition and Fees	178
Health Insurance	178
Computer Technology	178
Financial Support	178
Graduation Requirements	179
Courses of Instruction	179
Master of Management in Clinical Informatics	183
Requirements for Admission	184
Academic Calendar	184
Financial Information	185
Academic Regulations	185
Curriculum Overview	187

Courses of Instruction	187
Management Courses	187
Clinical Informatics Courses	187
Master of Health Sciences Degree Programs	189
The Clinical Leadership Program	189
The Clinical Research Training Program	196
The Pathologists' Assistant Program	203
The Physician Assistant Program	213
School of Medicine Professional Certificate Programs	234
Ophthalmic Medical Technician	234
General Information for Students	240
Student Life	240
Services Available	242
Resources for Study	245
Graduate Program Information	251
Accreditation Council for Graduate Medical Education Programs	251
Duke Graduate Medical Education Employment Requirements	253
Auditing of Courses by House Staff	254
International Medical Graduates (IMG)	255
Continuing Medical Education	256
Index	257

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“I have selected Duke University as one of the principal objects of this trust because I recognize that education, when conducted along sane and practical, as opposed to dogmatic and theoretical, lines is, next to religion, the greatest civilizing influence. I have selected hospitals as another of the principal objects of this trust because I recognize that they have become indispensable institutions, not only by way of ministering to the comfort of the sick, but in increasing the efficiency of mankind and prolonging human life.”

—James Buchanan Duke, *Indenture of the Duke Endowment*, 1924

In 1924 James Buchanan Duke, an industrialist and philanthropist, established The Duke Endowment and directed that part of his gift be used to transform Trinity College in Durham, North Carolina, into Duke University.

The following year, upon his death, Mr. Duke made an additional bequest to the endowment and the university, including funds to establish a medical school, hospital, and nursing home.

One of Mr. Duke's primary motivations in establishing the endowment and the School of Medicine was the improvement of health care in the Carolinas. At a time when medicine in the region was still a cottage industry, James B. Duke dared to dream of creating what he hoped would become one of the leading medical institutions in the nation.

By the time the new school and hospital opened in 1930, this dream was already well on its way to becoming reality. Less than five years after the School of Medicine opened, the Association of American Medical Colleges ranked it among the top 25 percent of medical schools in the country. Today, the School of Medicine ranks eighth nationally among medical schools.

The school's unique curriculum is different from that of other medical schools. Students study the core basic sciences for one year instead of two, giving them the opportunity to devote their entire third year to a scholarly research project. Students care for patients during their second year, a full year earlier than their peers. The scientific grounding for that education is provided through participation in a wide variety of ongoing research programs. Duke Medicine encompasses the Duke University School of Medicine, the Duke University School of Nursing, and the Duke University Health System and its three hospitals, Duke University Hospital, Duke Regional Hospital, and Duke Raleigh Hospital and is recognized as one of the nation's most respected academic medical centers. The School of Medicine is consistently one of the largest recipients of funding from the National Institutes of Health.

Representing the continuing fulfillment of the dream of James Buchanan Duke, Duke Medicine still seeks to carry out its teaching, research, and patient care programs in a manner that meets the needs of society. In keeping with its heritage, it seeks to provide socially relevant medical education, research, and patient care and is expressly committed to the search for solutions to regional, national, and global health care problems.

Duke University School of Medicine's mission is to transform medicine and health locally and globally through innovative scientific research, rapid translation of breakthrough discoveries, educating future clinical and scientific leaders, advocating and practicing evidence-based medicine to improve community health, and leading efforts to eliminate health inequalities.

The website for Duke University School of Medicine is <https://medschool.duke.edu/education/student-services/office-registrar>.

Duke-NUS Graduate Medical School Singapore

The Duke-NUS Graduate Medical School Singapore (Duke-NUS) was established in 2005 as a strategic collaboration between the Duke University School of Medicine and the National University of Singapore (NUS). The school's curriculum is patterned after that of the Duke University School of Medicine. The school is part of the National University of Singapore system. The partnership presents a valuable strategic opportunity for Duke to expand its global reach and research. Its inaugural class matriculated in August 2007. In 2010, the school launched a PhD program. Duke-NUS graduated its first class in 2011 with joint MD degrees from Duke and NUS. The website for Duke-NUS Graduate Medical School Singapore is <http://www.duke-nus.edu.sg>.

Duke University School of Medicine

The School of Medicine comprises seven basic departments, fourteen clinical departments, and numerous centers and institutes (several of which are highlighted below) that promote cross-institutional, multidisciplinary efforts designed to harness strengths and leverage knowledge to make significant contributions to science, medicine, and human health.

Duke Cancer Institute

The Duke Cancer Institute (DCI) unites hundreds of cancer physicians, researchers, educators, and staff under a shared administrative structure to accelerate research advances related to cancer and improve Duke's ability to translate these discoveries into the most advanced cancer care to patients. The DCI is one of only forty-one centers in the country designed by the National Cancer Institute (NCI) as a "comprehensive cancer center," combining cutting-edge research with compassionate care.

Global Health Institute

Duke's Global Health Institute (DGHI) is a university-wide effort to address health disparities worldwide through multidisciplinary research, education, policy engagement, and service. DGHI's education, research, and capacity building initiatives are built on a strong network of partnerships with institutions around the world.

Duke Human Vaccine Institute

The Duke Human Vaccine Institute (DHVI) has established a place of national and international leadership in the fight against major infectious diseases. DHVI plays an integral leadership role in the Global HIV/AIDS Vaccine Enterprise and is a pioneer in emerging infections and biodefense research. By focusing on the scientific "bottlenecks" for the development of HIV, TB, and other vaccines, DHVI investigators continue to make significant contributions to overcome global health challenges on behalf of society.

Duke Clinical Research Institute

The Duke Clinical Research Institute (DCRI) is the world's largest academic clinical research organization. Known for conducting groundbreaking multinational clinical trials, managing major national patient registries, and performing landmark outcomes research, research conducted in the DCRI spans multiple disciplines, from pediatrics to geriatrics, primary care to subspecialty medicine, and genomics to proteomics. The DCRI also is home to the Duke Databank for Cardiovascular Diseases, the largest and oldest institutional cardiovascular database in the world, which continues to inform clinical decision-making 40 years after its founding.

School of Medicine History

1891: First plan for a medical school

Trinity College President John Franklin Crowell makes public a plan for starting a medical college with a teaching hospital at Trinity College.

1924: Duke Endowment established

James B. Duke establishes The Duke Endowment and directs that part of his \$40 million gift be used to transform Durham's Trinity College into Duke University.

1925: Bequest to improve health care

James B. Duke makes an additional bequest to establish the School of Medicine, School of Nursing, and Duke Hospital, with the goal of improving health care in the Carolinas.

1927: Dean selected

Dr. Wilburt Cornell Davison, a pediatrician from Johns Hopkins, is appointed dean of Duke University School of Medicine and Duke Hospital on January 21.

1927: Construction begins

Construction begins on the School of Medicine and Duke University Hospital.

1929: Students selected

3,000 applicants apply to the new medical school. Seventy first- and third-year students are selected, including four women.

1930: Duke University Hospital opens

Duke University Hospital opens for patients on July 21.

1930: Medical classes begin

The 18 third-year and 30 first-year medical students begin classes on October 2.

1931: Dedication ceremony

The dedication ceremony for Duke University School of Medicine and Duke Hospital is held on April 20.

1931: PDC organized

The Private Diagnostic Clinics are organized.

1932: First MD graduates

The first medical class graduates, including E.W. Robbins, MD'32, the first female alumna.

1935: Duke ranks in top 25 percent

The Association of American Medical Colleges (AAMC) ranks Duke among the top 25 percent of medical schools in the country—less than five years after it opened.

1936: Hospital infection breakthrough

Duke surgeons led by Dr. J. Deryl Hart pioneer the use of ultraviolet lamps in operating rooms to eliminate infectious organisms that cause post-operative infections. This procedure dramatically reduces the number of infections and related deaths.

1937: Equine encephalomyelitis vaccine

Dr. Joseph Beard, working with his wife and research partner, Dorothy Beard, develops a vaccine against equine encephalomyelitis.

1937: Brain tumor program established

Duke establishes the nation's first brain tumor research and education program, launching what will become one of the world's foremost cancer programs.

1939: Dietary break-through

Continuing through the 1940s and 1950s, Dr. Walter Kempner's research, using a rice-based diet and daily laboratory testing, demonstrates that degenerative processes attacking the kidney, heart, brain, and retina can be arrested by dietary changes. These dramatic findings draw patients to Duke from across the nation.

1940: Medical Alumni Association organized

Duke's Medical Alumni Association is organized.

1947: Research building opens

Bell Research Building opened as the first building of the medical center that wasn't connected with the main buildings.

1950: Cerebral palsy hospital dedicated

North Carolina Cerebral Palsy Hospital is dedicated with forty beds, now Lenox Baker Children's Hospital.

1950: Child-proof safety caps

Duke pediatrician Dr. Jay Arena leads the push for drug companies to develop the child-proof safety cap to prevent childhood poisoning, then a major health problem.

1955: Duke Center for Aging

Psychiatrist Dr. Ewald W. Busse establishes the Duke University Center for Aging, the first research center of its kind in the nation. Now the oldest continuously running aging center in the United States, the Duke Center for the Study of Aging and Human Development has pioneered long-term studies of health problems among the elderly.

1957: Medical Center expansion

Outpatient Private Diagnostic Clinics and Hanes and Reed private floors and operating rooms opens.

1959: Advances in open-heart surgery

Duke develops a machine that lowers patients' blood temperatures below 68 degrees Fahrenheit and is the first to place a patient under this deep hypothermia during open-heart surgery.

1960: Second dean appointed

With the retirement of Dean Wilburt C. Davison, Dr. Barnes Woodhall, a neurosurgeon, is appointed dean of the School of Medicine.

1963: New building opens

The Clinical Research Building opens (Stead Building).

1963: Hyperbaric chamber

The hyperbaric chamber opens.

1963: Minority students admitted

The first African American student, W. Delano Meriwether, is admitted to Duke University School of Medicine.

1964: Third dean appointed

When Dean Barnes Woodhall becomes vice provost of Duke University, Dr. William G. Anlyan, a general and thoracic surgeon, becomes dean of the School of Medicine.

1965: Physician Assistant program

Under the leadership of then-chair of medicine Dr. Eugene A. Stead Jr., Duke establishes the nation's first Physician Assistant Program.

1966: Building expansion

New Duke Hospital Entrance, the Woodhall Building, opens.

1966: New curriculum

Duke introduces a new medical school curriculum that emphasizes critical thinking and evaluation over rote memorization and provides greater flexibility, earlier clinical exposure, and increased research opportunities.

1966: MSTP established

The Duke Medical Scientist Training Program, a joint degree program leading to both the MD and the PhD degrees, is founded. It is one of the first three in the nation.

1968: Research building opens

The Nanaline Duke Research Building opens.

1968: Superoxide dismutase

Dr. Irwin Fridovich and graduate student Joe McCord discover the enzyme which protects all living things against the toxicity of oxygen.

1969: 1,000-foot dive

In its hyperbaric chamber, Duke conducts the first recorded studies of human ability to function and work at pressures equal to a 1,000-foot deep-sea dive.

1969: The Davison Club

A group of Duke medical alumni establish the Davison Club to provide support for scholarships and medical education at Duke.

1972: Duke Comprehensive Cancer Center established

The Duke Comprehensive Cancer Center becomes one of the nation's first cancer centers to be established with the passage of the National Cancer Act. In 1973, Duke is designated as a "comprehensive" cancer center by the National Cancer Institute in 1973.

1973: Expansion continues

The Sands Research Building opens

1973: Duke Eye Center opens

The Duke Eye Center opens in what is now the Wadsworth Building.

1975: Medical library moves

The Seeley G. Mudd Building housing the Medical Center Library opens.

1975: Research building expansion

The Jones Research Building opens.

1978: Cancer research expansion

The Morris Cancer Research Building opens.

1980: Duke North opens

The new \$94.5 million, 616-bed Duke North Hospital opens, bringing the total number of patient beds to more than 1,000.

1981: Major scientific breakthrough

A Duke biophysicist's ribbon diagram, a method of representing the 3D structure of proteins, is first published.

1982: Rare childhood disease breakthrough

Duke pediatric immunologist Rebecca Buckley uses matched or unmatched bone marrow transplantation to restore the immune systems of children born with severe combined immunodeficiency, also known as bubble boy disease. Today, Duke's program is the world's largest and most successful.

1985: AZT clinical trials

Duke becomes one of two hospitals to conduct the first human clinical trials of AZT, the first drug to offer a substantial improvement in quality of life for AIDS patients.

1989: Fourth dean appointed

Dr. Ralph Snyderman, HS'67, a rheumatologist, is appointed chancellor for health affairs and dean of the School of Medicine on January 1.

1990: New research building

The Bryan Research Building opens.

1990: Alzheimer's discovery

Duke researchers discover a gene that increases people's risk of developing the most common kind of Alzheimer's disease, showing for the first time that it can be inherited.

1992: First bone-marrow transplantation program

The Duke Comprehensive Cancer Center develops the nation's first outpatient bone-marrow transplantation program.

1993: First umbilical cord blood transplant

Dr. Joanne Kurtzberg performs the world's first umbilical cord blood transplant at Duke, opening the door for lifesaving transplants between unmatched donors and recipients.

1994: Cure for DiGeorge syndrome

Dr. Louise Markert demonstrates that babies born with no immune system, a fatal condition known as complete DiGeorge syndrome, can be cured with thymus transplantation, a procedure she perfected at Duke.

1994: Major research expansion

The Levine Science Research Center and Medical Sciences Research Building open.

1994: Breast cancer discovery

Duke scientists help discover the BRCA1 the gene responsible for many inherited forms of breast cancer.

1995: MRI lung image

Duke scientists, with colleagues at Princeton University, generate the first clear images of the human lung using magnetic resonance imaging (MRI). The new technique greatly aids diagnosis and treatment of lung disorders such as emphysema and asthma.

1998: Duke University Health System established

The Duke University Health System—an integrated academic health care system—is created as Duke establishes partnerships with Durham Regional Hospital (now Duke Regional Hospital, Raleigh Community Hospital (now Duke Raleigh Hospital), and other regional health care providers. Dr. Ralph Snyderman is the first president.

1998: New Ambulatory Surgery Center

Duke North Pavilion a new outpatient surgery center, opens.

1999: Fifth dean appointed

Dr. Edward W. Holmes, HS'70-'74, a scientist specializing in genetics and metabolic disease, becomes the fifth dean of Duke University School of Medicine. The role of chancellor for health affairs is separated from the dean's role and retained by Dr. Ralph Snyderman, who is also president and CEO of Duke University Health System.

1999: New Clinics

The old Duke Hospital (Duke South) is renovated and opens as Duke Clinic in 1999.

2000: Children's health center opens

The McGovern-Davison Children's Health Center opens.

2001: Sixth dean appointed

Dr. R. Sanders "Sandy" Williams, MD'74, HS'77-'80, a cardiologist, is appointed 6th dean of Duke University School of Medicine.

2002: Research expansion

Genome Sciences Research Building I opens on LaSalle Road

2004: Third chancellor for health affairs appointed

Dr. Victor J. Dzau, MD, a cardiologist, is appointed chancellor for health affairs, Duke University, and president and CEO, Duke University Health System

2004: Eye Research Institute

Ruth and Herman Albert Eye Research Institute opens.

2004: Engineering-medicine collaboration

The Center for Interdisciplinary Engineering, Medicine, and Applied Sciences (CIEMAS) opens, expanding the collaboration between Duke University's Pratt School of Engineering and the School of Medicine.

2005: Center for HIV/AIDS Vaccine Immunology

Funded by the largest NIH grant in the country, Dr. Barton Haynes leads a team of experts in efforts to lay the groundwork for a vaccine against HIV/AIDS.

2006: Pompe disease cured

Duke wins FDA approval of the drug Myozyme, the first and only cure for Pompe disease, a rare and fatal metabolic disorder. The drug is the work of Y.T. Chen, MD, and Priya Kishnani, MD, in the Department of Pediatrics, Division of Medical Genetics.

2007: Seventh dean appointed

Nancy C. Andrews, MD, PhD, is appointed the 7th dean of Duke University School of Medicine. She is the first woman to lead a top ten US medical school.

2009: Duke Singapore partnership

Duke-National University of Singapore Graduate Medical School opens as a partnership in research and education between the School of Medicine and the Singaporean government.

2011: Duke Cancer Center opens

The Duke Cancer Center, dedicated solely to the care of patients with cancer opens in February 2011.

2011: Major advancement in brain tumor research

Hai Yan, MD, PhD, and a team of scientists from Duke and Johns Hopkins universities identify mutations in a gene that makes cells immortal and appear to play a pivotal role in three of the most common types of brain tumors, as well as cancers of the liver, tongue and urinary tract.

2011: Primary Care Leadership Track

The School of Medicine establishes an innovative program to educate students who will become change agents in community health and primary care.

2012: Nobel Prize

Dr. Robert Lefkowitz shares the Nobel Prize in Chemistry with Dr. Brian Kobilka, HS'87, for their work on cell receptors.

2013: Trent Semans Center opens

In January, classes begin in the Mary Duke Biddle Trent Semans Center for Health Education, the first building dedicated to medical education since the Davison Building opened in 1930. The \$53 million Trent Semans Center was paid for almost entirely through philanthropy.

2013: Duke Medicine Pavilion

The 8-floor, 608,000 square foot in-patient pavilion includes 160 critical care rooms, 18 operating rooms and an imaging suite. The building's environmentally-friendly design earned it a LEED silver certification.

2013: First in human procedure Physician-scientist

Jeffery Lawson, MD, PhD, and Laura Niklason, MD, PhD, of Yale School of Medicine, develop a bioengineered blood vessel, which Lawson grafted into an artery in a Duke patient's arm, the first in-human procedure of its kind in the United States.

2013: Discovery offers new direction for epilepsy treatment

Duke researcher David Goldstein, PhD, identifies two new genes and implicates 25 distinct mutations in serious forms of epilepsy, suggesting a new direction for developing tailored treatments of the neurological disorders.

History of Duke University

Duke University traces its roots to 1838 in nearby Randolph County, where local Methodist and Quaker communities joined forces to support a permanent school that they named Union Institute. After a brief period as Normal College (1851-59), the school changed its name to Trinity College in 1859 and became a liberal arts college affiliated with the Methodist Church. The college moved to the growing city of Durham in 1892 when Washington Duke provided financial assistance and another local businessman, Julian S. Carr, donated land. In December 1924, the trustees graciously accepted the provisions of James B. Duke's indenture creating the family philanthropic foundation, The Duke Endowment, which provided for the expansion of Trinity College into Duke University.

As a result of the Duke gift, Trinity underwent both academic and physical expansion. The original Durham campus became known as East Campus when it was rebuilt in stately Georgian architecture. West Campus, Gothic in style and dominated by the soaring tower of the Duke Chapel, opened in 1930.

In 1972, the men's and women's colleges merged into the Trinity College of Arts & Sciences. Academic expansion of the university throughout its history has also included the establishment of graduate and professional schools. Duke now is composed of ten schools, including The Graduate School, Duke Divinity School, the School of Medicine, the School of Nursing, the School of Law, the Pratt School of Engineering, The Fuqua School of Business, the Nicholas School of the Environment, and the Sanford School of Public Policy, along with international outposts, including one in Kunshan, China. Today, Duke embraces a diverse community of learners, including approximately 6,500 undergraduates and 7,500 graduate and professional students from a multiplicity of backgrounds.

Durham, with a population of 200,000, is in the Piedmont region of North Carolina and has easy access to the sea coast and mountains. It is one of the three cities bounding the Research Triangle Park, where numerous private research laboratories and governmental agencies are located. Duke University is twenty-five miles from North Carolina State University in Raleigh, eight miles from The University of North Carolina at Chapel Hill, and is in the same city as North Carolina Central University.

For more historical information, visit <http://library.duke.edu/rubenstein/uarchives>.

Doctor of Medicine Program



Duke School of Medicine Mission Statement for the Education of Medical Students

The mission of the educational program for MD students at Duke University is to prepare a diverse student body to pursue a spectrum of medical career options in order to become physician leaders who can advance biomedical research and improve local, national, and global health.

The general goals of the educational program are to ensure that students:

- acquire an understanding of core basic and clinical science knowledge;
- develop the clinical skills to care for diverse patient populations;
- explore how scientific investigation transforms medical knowledge and clinical care;
- demonstrate creativity, leadership, scholarship, and teamwork;
- direct and practice respectful patient-centered care;
- display professional, ethical, and humanistic behaviors; and
- build the skills necessary to be a lifelong learner.

Physicians are facing profound changes in the need for understanding health, disease, and the delivery of medical care—changes which shape the vision of the medical school. These changes include a broader scientific base for medical practice; a national crisis in the cost of health care; an increased number of career options for physicians, yet the need for more generalists; an emphasis on career-long learning in investigative and clinical medicine; the necessity that physicians work cooperatively and effectively as leaders among other health care professionals; and the emergence of ethical issues not heretofore encountered by physicians. Medical educators must prepare physicians to respond to these changes. The most successful medical schools will position their students to take the lead addressing national health needs. Duke University School of Medicine is prepared to meet this challenge by educating outstanding practitioners, physician scientists, and leaders.

Continuing at the forefront of medical education requires more than educating Duke students in basic science, clinical research, and clinical programs for meeting the health care needs of society. Today, medical education also requires addressing such concerns as national science and health policy, providing medical care for the disadvantaged, and applying basic science discoveries to clinical medicine. As health care practices at the federal, state, institutional, and individual levels evolve, these endeavors need input from physicians uniquely prepared to assume guiding roles.

Duke University's role as a leader in medical education is built upon its internationally recognized tradition of fostering scientific scholarship and providing excellent preparation for the practice of medicine. The curriculum promotes creativity, scholarship, leadership, and diversity. It integrates the basic and clinical sciences and prepares students to pursue the spectrum of options available to modern physicians, from basic science to primary care. The School of Medicine produces at least three prototype physicians; the physician scientist, the clinician-investigator, and the practitioner (either generalist or specialist).

The Duke faculty enhance the School of Medicine's curriculum by continually embracing new methods of education and evaluation to improve the medical education experience. Attention to curricular development assures Duke graduates that they are grounded in basic biomedical sciences, trained to become competent and caring clinicians, prepared to pursue a lifetime of continuing education, and capable of participating in local, national, and international discussions about the delivery of health care now and in the future.

Features of the four-year curriculum include:

- development of a core medical curriculum that is rigorous, efficient, integrative, and forms a realistic base of knowledge for a physician;
- integration of basic, clinical, psychosocial, and population information and skills throughout the four years of medical education;
- general introduction to basic and clinical science for one year each, followed by two years of individualized curricular options that promote professional diversity and personal development;
- an elective third year which permits students to pursue their independent scholarly interest across a range of scientific disciplines from basic biomedical science to health policy;
- promotion of structured active learning that includes explicit experience in leadership and cooperative roles;
- mentorship of students by faculty in all facets of the learning process;
- implementation of a standardized and valid assessment of progress, carefully and thoughtfully evaluating the acquisition of knowledge, skills, and attitudes appropriate to the future goals of each student;
- incorporation of information technology and the use of computers into student learning and evaluation; and
- research and implementation of new and improved methods of teaching.

The curriculum offers flexibility in the medical education program and new opportunities for intellectual exploration. It also makes heavy demands upon the student. It should be recognized that medical students at the School of Medicine are expected to maintain a consistent level of performance and to demonstrate qualities of initiative and dedication to their chosen profession. A scholarly attitude toward medicine that continues throughout an entire career is an important objective of the medical school. The foundations of this attitude toward learning should accompany the student upon entering.

Students also are expected to maintain a professional attitude toward patients at all times, to respect confidences, and to recognize that they are the recipients of privileged information only to be discussed within the context of scholarship and in circumstances that truly contribute to the educational process or to the care of the patient. This attitude involves consideration not only of speech and personal appearance but also of morality, honor, and integrity.

The medical education program also focuses on ethics and human values. In the face of major advances in medical technology and sciences, today's medical student must be prepared to deal with new complexities of medical practice. These advances and complexities also make it of paramount importance that medical education enable each student to grow in both depth and breadth as a human being. The School of Medicine is rising to this challenge.

Admission Procedures

Maturity, strong study habits, intelligence, character, humanism, and integrity are essential qualifications for admission to Duke University School of Medicine. Beyond this, premedical students should strive for an education that develops abilities to observe critically, think analytically, and work both independently as well collegially as part of a team. Although knowledge of basic scientific principles should be secured, the competence with which premedical students conduct their undergraduate careers is of more importance than the specific subjects which they study.

Application for Admission

The Duke University School of Medicine participates in the American Medical College Application Service (AMCAS), and application to the School of Medicine must begin by submitting the electronic AMCAS application. The application may be accessed at the following website: <http://www.aamc.org/students>.

Upon receipt of the application data from AMCAS, all applicants receive a Duke University School of Medicine Supplemental Application. When the Supplemental Application and application fee are submitted, a favorable screen by the members of the admission screening committee of an applicant's AMCAS application and supplemental application materials generates an invitation for an on-site interview. Applications should be submitted between June 1 and October 15, the deadline for all materials to be received by AMCAS to be considered at Duke Medical School. Applicants are urged to file their AMCAS applications as early in the admission cycle as possible since interview slots can fill quickly. AMCAS may take as long as four to six weeks to process and verify application and transcripts. It is the applicant's responsibility to ensure that his/her application is verified by AMCAS in order for AMCAS to transmit your application data to Duke by the Duke AMCAS Application deadline.

All interviews are conducted on site at the School of Medicine. No regional interviews are offered. Applicants are encouraged to complete their applications as early as possible in the application cycle to secure an interview. The final deadline for receipt of the Supplemental Application is October 30 but we strongly encourage applicants to complete both the AMCAS Application and the Duke University School of Medicine Supplemental Application four to six weeks prior to the posted deadlines. Applicants who complete their applications earlier in the process on average have a broader range of interview dates from which to select. Our interviews are conducted from early-September to mid-February of the application cycle.

Requirements

Applicants applying for admission to the School of Medicine prior to the 2016 entering class must complete a minimum of ninety hours of approved college credit, including one year of college English or a university writing course, a minimum of one semester of inorganic chemistry with lab, one minimum of one semester of organic chemistry with lab, one year of physics with lab, one year of biology and/or zoology with lab, one semester of calculus and one semester of another college-level mathematics course, preferably statistics. An introductory course in biochemistry and cell biology (labs not required) are also required. All science requirements must be complete not more than seven years prior to matriculation. The administration of the 2015 MCAT has prompted the following changes to our requirements for applicants applying for admission to the 2016 entering class and beyond: applicants must have completed at least one of the following courses: cell biology, molecular biology, or genetics. One semester of biochemistry (or evidence that biochemistry was included in one of either cell biology, molecular biology of genetics) is required (lab portion of biochemistry is not required), one semester of physics (lab optional), one semester of statistics, two semesters of expository writing (this requirements may be satisfied by an intensive writing course in history, political science, philosophy, etc.), and at least two upper level courses in psychology, sociology, or anthropology with an emphasis on the social determinants of health care and the biologic basis of behavior. Spanish is recommended.

The Medical College Admission Test (MCAT), administered by the American College Testing Programs and Services, PO Box 414, Iowa City, IA 52240, is required of all applicants. This test is administered each year at numerous colleges throughout the United States. If possible, applicants should arrange to take the MCAT as early as possible in the year they plan to submit applications for admission. MCAT scores dated earlier than four years prior to the year for which an applicant is seeking will not be considered. Information regarding the MCAT can be obtained by visiting the official site for the MCAT which provides registration instructions, test dates, and testing locations: <https://www.aamc.org/students/applying/mcat/>.

School of Medicine Technical Standards

All candidates for the MD degree must possess the physical and mental skills and abilities necessary to successfully complete the medical school curriculum. To achieve the optimal educational experience, students are required to participate in all phases of the training program.

The study of medicine is not a pure intellectual exercise. Rather, a specific set of minimal physical, mental, emotional, and social abilities are needed to be a successful student. Students must possess all of the abilities listed in the five categories below. The use of an intermediary that would, in effect, require a student to rely on someone else's power of observation and/or communication will not be permitted.

Observation

- Visually observe materials presented in the learning environment including audiovisual presentations, written documents, microbiology cultures, microscopic examination of microorganisms, tissues and gross organs in the normal and pathologic state, and diagnostic images;
- Observe patients accurately and completely, both at a distance and directly. This requires functional vision, hearing, and sensation.

Communication

- Effectively speak, write, hear, read, and use a keyboard;
- Perceive nonverbal communications, including facial expressions, body language, and affect;
- Communicate effectively and sensitively with patients and their families via speech as well as reading/writing;
- Communicate in oral and written form with the health care team in an effective, accurate, and efficient manner.

Motor

- Elicit information from patients via palpation, auscultation, and percussion, as well as carry out diagnostic maneuvers;
- Execute movements reasonably required to provide general medical care and emergency treatment to patients. These skills require coordination of gross and fine motor movements, equilibrium, and sensation; and
- Manipulate equipment and instruments to perform basic laboratory tests and procedures as required to attain curricular goals. (e.g. needles, stethoscope, ophthalmoscope, tongue blades, intravenous equipment, scalpel).

Intellectual/conceptual, Integrative, and Quantitative Abilities

- Perform calculations necessary to solve quantitative problems as required by the curriculum;
- Collect, organize, prioritize, analyze, and assimilate large amounts of technically detailed and complex information in a timely fashion. This information will be presented in a variety of educational settings, including lectures, small group discussions, and individual clinical settings. The applicant should be able to analyze, integrate, and apply this information appropriately for problem-solving and decision-making;
- Apply knowledge and reasoning to solve problems as outlined by the curriculum;
- Comprehend the three-dimensional spatial relationships of structures; and
- Remain awake and alert.

Behavioral, Emotional and Social Attributes

- Possess the emotional health to fully apply his/her intellectual skill, exercise good judgment, and to complete all responsibilities attendant to the diagnosis and care of patients;
- Develop a mature, sensitive, and effective relationship with patients and colleagues;
- Tolerate the physical, mental, and emotional stress experienced during training and patient care;
- Possess qualities of adaptability, flexibility, and the ability to function in the face of uncertainty;
- Form a compassionate relationship with his/her patients while maintaining appropriate boundaries for a professional relationship;
- Behave in an ethical and moral manner consistent with professional values and standards;
- Exhibit sufficient interpersonal skills, knowledge, and attitudes to interact positively and sensitively with people from all parts of society, ethnic backgrounds, and belief systems; and
- Cooperate with others and work corroboratively as a team.

The faculty of the Duke University School of Medicine recognizes its responsibility to present candidates for the MD degree that have the knowledge, attitudes, and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care. Candidates for the MD degree at Duke will be prepared to enter postgraduate medical education as general physicians able to undertake specialty education.

The Committee on Admissions is responsible for adhering to these technical standards during the selection of medical students.

Selection

The earliest date of notification of acceptance is in early March for applicants entering the following August. Those selected to interview are carefully evaluated by the Committee on Admissions. A personal interview is conducted at Duke for those applicants with competitive credentials. The interview format at the Duke University School of Medicine is the Multiple Mini Interview (MMI). Candidates who demonstrate the most promise for exceptional performance in their future practice of medicine are admitted on the basis of merit. In order to ensure enrollment, accepted candidates must return a signed agreement within three weeks after notification. Since admission is offered in advance of matriculation, it is provisional upon the successful completion of any incomplete, premedical, and required subjects as well as the continued demonstration of scholarship in college coursework. Incoming medical students must consent to and undergo a mandatory criminal background check and a mandatory drug screening prior to matriculation. Both the criminal background check and the drug screening are conducted by the Duke Health System and the results of both are kept strictly confidential. A negative or failed background check or drug screening does not necessarily prohibit a student from entering medical school but the student's standing will be evaluated on a case-by-case basis. An incoming student will not be permitted to begin orientation and/or classes without consenting to a criminal background check and a drug screening.

Applicants who are not US citizens or who are not Lawful Permanent Residents (LPR) of the United States are granted equal consideration for admission to the medical school. Financial support is not guaranteed for the international applicants and as such, if accepted applicants must be prepared to finance their education either with personal or other funding sources. If an applicant is a Lawful Permanent Resident and holds a "green card," the green card must be in the incoming student's possession at the time an offer of admission is extended. If the green card is not in the student's possession, then the student will be required to provide proof of funding in order for the School of Medicine to begin processing the documents required by the US Department of Homeland Security.

Transfer

Transfers are considered only into the clinical year (Year Two) at the School of Medicine and only for the spouses of Duke House staff (i.e., residents, fellows, etc.), medical school faculty, or currently enrolled students in the School of Medicine. If all of these criteria are met, a student requesting consideration for transfer cannot begin the process until confirmation by the Duke University School of Medicine of space availability in the second year of the Duke curriculum is known, usually early to mid-June of the academic year. All required materials and evaluations must be completed by July 15.

The application procedures are as follows:

1. completion of the Duke University School of Medicine Secondary Application and completion of a criminal background check;
2. receipt of the AMCAS application data that was submitted for the applicant's original medical school application;
3. a letter from the dean of the medical school where the student is currently enrolled plus two letters from faculty supporting the applicant's candidacy for transfer;
4. a certified transcript from the institution the student will be transferring from;
5. passing/satisfactory performance on the USMLE Step 1;
6. satisfactory completion of the basic science coursework at the current medical school;
7. if deemed appropriate after review of the above, an interview with two members of the Duke University School of Medicine Executive Admissions Committee; and
8. a final decision by the dean of the Duke University School of Medicine.

Questions may be directed to the Duke University School of Medicine, Office of Admissions, DUMC 3710, Durham, NC 27710.

Advanced Placement

After acceptance to the School of Medicine, applicants who hold PhD degrees in biomedical or preclinical sciences may apply to be considered for a three-year, MD degree program. This program consists of the core basic science courses during the first year, the core clinical rotations during the second year, and clinical electives during the third year. If the PhD has not been awarded prior to matriculation, the student is not eligible for this program. Applications to receive credit for the PhD can be obtained at the medical school admissions and registrar's offices,

and must be submitted to the registrar's office by the end of the first year of enrollment. A subcommittee of the Third Year Committee is formed to review the dissertation which is then sent to full committee for approval. A recommendation is made to the Vice Dean who will formalize the waiver who then notifies the student and registrar's office.

Reapplication

Applicants who wish to reapply should contact AMCAS to complete a new AMCAS application. Supporting information will be transferred to the new application. These documents are kept on file for three years. To be seriously considered, reapplicants must demonstrate significant additions of experience or coursework to the original application.

Financial Information and Tuition and Fees

Tuition Policy Statement

The Duke University School of Medicine's mission in medical education is to build upon our internationally recognized tradition of excellence in training outstanding practitioners and physician-scientists who will be leaders in all fields of medicine. By selecting outstanding and dedicated students for matriculation, the school is committed to preparing physicians to respond to societal health needs. The School of Medicine has a policy of need-blind admission and adequate financial aid for those students with financial need. Tuition is set at a level that is competitive with schools of comparable quality and selectivity for admission. This tuition policy, plus a financial aid program which protects against excessive student indebtedness, permits the School of Medicine to attract the most qualified students nationally and regionally, regardless of the student applicant's personal or family financial status. It is important that tuition and financial aid are balanced to ensure that debt does not skew career choices of medical students once they graduate from the medical school. All students (except MSTP and those exempted from third year) are responsible to pay four years of medical school tuition.

Tuition

The following table represents an estimate of a student's necessary expenses in the School of Medicine. The total of these figures suggests a basic minimum budget of approximately \$74,200 for a fourth year student to \$83,700 for a first year student. These are estimated figures only. Tuition and fees are subject to change without notice.

2015-16 Estimated Cost of Education

Expense	Amount
Tuition	\$53,575
Technology fee	\$2,000
First year fees ^a (includes microscope rental, first year only)	\$1,649
Annual cost of books and supplies: first year	\$1,400
Annual cost of books and supplies: second year	\$1,000
Annual cost of books and supplies: third and fourth years	\$500
Rent, board, miscellaneous, and travel: first and third years (12 mos.)	\$24,144
Rent, board, and miscellaneous: second year (13 mos.)	\$26,156
Rent, board, and miscellaneous: fourth year (8 mos.)	\$16,096
Continuing Optional Research Study Fee ^b (per semester)	\$500
Motor vehicle registration: car	\$402

a.Sphygmomanometer, ophthalmoscope, otoscope, and other equipment required of each student must conform to rigid standards.

b.The School of Medicine encourages students to interrupt their studies to pursue approved research that is complementary to the medical curriculum at Duke or elsewhere for no credit. To retain full-time student status for loan deferment purposes, students may seek approval to enroll in the Continuation of Research Study option. Only students eligible to be enrolled at Duke during the applicable time period may participate.

All individuals registered in the Duke University School of Medicine as MD degree candidates are considered to be full-time students if they are registered for a minimum of eight credits each semester. Each student determines the

number and types of courses taken with their advisory dean and, when applicable, one or more of the appropriate committees.

Tuition and fees are payable on a semester basis. Students are required to pay full tuition for four years as a requirement for graduation. Tuition rates are determined according to matriculation date and increase yearly at a rate determined by the School of Medicine Finance and Resource Planning Office and approved by the Board of Trustees. Students are charged for no more than the equivalent of four full years of tuition. A student who fulfills the tuition payment obligation but has not completed requirements by the end of the last payment period is not assessed additional tuition during any subsequent terms of enrollment.

Students are eligible for need-based financial aid for the four years of tuition-based enrollment. Extended periods of enrollment are not grant eligible and loans are available only if the student meets certain federal requirements. For additional information, please contact the Office of Financial Aid.

Failure to pay tuition, complete any academic requirements, or complete a financial aid exit interview will result in a block of a student's academic transcript. Until all School of Medicine requirements are met, the transcript will not be released for any purpose.

Advanced Standing Matriculants

Students who enter the MD degree program with previously earned doctorate degrees may petition the Third Year Committee and Vice Dean to receive a maximum of thirty-six elective, basic science credits to be applied to the third year MD curriculum. Students granted sixteen transfer credits are given allowance for one tuition payment. Those granted thirty-six transfer credits are given allowance for two tuition payments. Advanced standing students who elect to register at Duke for the curricula for which they could have received transfer credit, forego the appropriate tuition waivers and are assessed tuition accordingly.

Enrollment Status Definitions

For various reasons, it may be appropriate for a medical student to be registered for an enrollment status other than continuously enrolled for credit for one or more terms. Upon receipt of the appropriate approved forms, the registrar's office will process enrollment in the enrollment statuses listed below. The exception would be free time (Interdisciplinary 450C). Students are not required to complete paperwork for free time, and they should enroll in that status during online registration periods. In all cases excepting extended time for second degree programs, a student must still complete the four years of enrollment for credit in medical school within a six-year period. Options include:

Continuation of Research Studies (CRS) is a semester term-based, noncredit bearing enrollment status used when the student is continuing the scholarly experience with the same mentor. It can be elected for up to three semesters following the initial scholarly experience. An application consisting of an interim report and mentor, study program director, and advisory dean approval is required. Full-time student status is maintained during this enrollment, and the student is eligible for the benefits of enrollment, including loan deferment, eligibility for student health services and insurance, and financial aid for living expenses. The required thesis based on the scholarly experience can be submitted either before or at the end of the period of CRS. Students may not be enrolled in any other coursework while enrolled in CRS. A continuation fee is charged for CRS status.

Optional Research Studies (ORS) is a semester term-based, noncredit bearing enrollment status used following the required scholarly experience when the student is conducting a new research project with a new mentor at Duke or away from Duke. It can be elected for up to three semesters. An application consisting of a brief research project description and approval by the mentor and the advisory dean is required. A brief report to the advisory dean on the progress of the project is required at the end of each semester. Full-time student status is maintained during this enrollment, and the student is eligible for the benefits of enrollment, including loan deferment, eligibility for student health services and insurance, and financial aid for living expenses. Students may not be enrolled in any other coursework while enrolled in this status. A continuation fee is charged for this status.

Independent Study (IS) is a four-week term-based, noncredit bearing enrollment status used when the student is engaged in medical education-related activity that is relevant to the degree (e.g. structured USMLE preparation, medical volunteerism, internship at organization related to training) but is not research. It can be elected for up to twelve 1-month terms. An application consisting of a brief description of the activity and advisory dean approval is required. A brief report to the advisory dean on the progress of the activity is required at the end of each four-week term. Full-time student status is maintained during this enrollment, and the student is eligible for the benefits of enrollment, including loan deferment, eligibility for student health services and insurance, but is not eligible for

financial aid for living expenses. A continuation fee is charged for this status if the student is enrolled in independent study for an entire term.

Free Time (FT) is a four-week term-based, noncredit-bearing status used when the student is not engaged in any curricular or education-related activity for brief periods of time less than a semester. The student is not considered enrolled and does not have the benefits of enrollment on this status unless s/he is registered for 50 percent or more of the semester term credits. Fourth-year medical students are required to enroll in free time for periods when they are not enrolled in classes or enrolled in another approved status. No fee is charged for this status.

The School of Medicine encourages students to interrupt their studies to pursue approved research that is complementary to the medical curriculum either at Duke or elsewhere for no credit. Full-time student status can be retained for a maximum period of two years during these periods of study if approval is obtained from the appropriate officials and the student registers for and pays an enrollment fee of \$50 for each semester or part of a semester away. The fee for enrollment Continuation of Research Studies (CRS 301B) and Optional Research Studies (OPTRS 301B) has been increased to \$500 per term beginning with the entering class of 2014. This was approved by the Board of Trustees in February 2014. No refund of any portion of the fee is allowed for students who subsequently withdraw from the School of Medicine. Students are eligible to apply for the federal Stafford loans for living expenses during this time. Please contact the Office of Financial Aid for further instructions.

Dual Degree Students. Beginning with the entering class of 2009, students pursuing dual degrees are responsible for both tuition expenses. A limited amount of scholarship support is available; it will be advertised in early November of each year.

Remediating Students. Students who are not registered for courses but are completing required remedial work as determined by the appropriate promotions committees are considered to have full-time status. They are not assessed tuition charges however students are eligible to apply for the federal Stafford loans for living expenses during this time. Please contact the Office of Financial Aid for further instructions.

Transfer Students. Only in extraordinary circumstances are transfer students accepted into the Duke program. However, in these instances, such a student must have completed successfully two years of coursework in the basic sciences to be eligible to apply. Upon entrance to the Duke MD program, transfer students receive credit for the first and third year curricula, and the corresponding four tuition payments are waived.

Merit Awards for Medical Students

Duke University School of Medicine has a limited number of merit scholarships. Application and awarding of these scholarships are determined by individual committees. These scholarships are:

Senior Scholarships are offered to third-year students for use during their fourth year of study. Selection by a special committee is based on outstanding academic achievement and extracurricular activities during the first two and one-half years of medical school. These scholarships, to be paid toward tuition, are in the range of \$20,000.

Financial need is not a criterion for selection; however, applicants who feel their financial need is greater than the merit award may apply for financial aid. Students who already have Duke-sponsored, full tuition scholarships are not eligible for funds from this scholarship. Funds supporting the Senior Scholarship program are:

William G. Anlyan, MD Scholarship, established 1988, by gifts from faculty, staff, and friends.

Barham Endowed Merit Fund, established November 1984, by gift from Mr. and Mrs. Joseph Barham, Oak Ridge, Louisiana.

The Dean's Merit Scholarships: Dean's Merit Scholarships range in amount of half current tuition to full current tuition and are awarded to academically excellent incoming medical students. Selection is made by the Vice Dean of Education based on recommendations from the Medical School Admissions Committee. Annual renewal is contingent upon satisfactory academic progress.

The Dean's Tuition Scholarships. Dean's Tuition Scholarships range in amount of half current tuition to full current tuition and are awarded to academically excellent incoming medical students whose life experiences and background will meaningfully contribute to the diversity of the class. Factors considered may include personal attributes, experiential factors, demographics, or other considerations. Selection is made by the Vice Dean of Education based on recommendations from the Medical School Admissions Committee. Annual renewal is contingent upon satisfactory academic progress. Funds supporting the Dean's Tuition Scholarship are:

- **Family Dollar Scholarship**, established November 1984, by gift from Mr. Leon Levine, Chairman of the Board, Family Dollar Stores, Inc., Charlotte, North Carolina.
- **Mary W. and Foster G. McGaw Scholarship**, established February 1986, by bequest from Foster G. McGaw.

Fullerton Medical Scholarships: Duke University School of Medicine is one of the six medical schools in North Carolina and South Carolina that participates in the Fullerton Foundation's Medical Scholarship program, established in 1985. The Program's objective is to “identify and reward the student who demonstrates and projects the potential for development into a highly capable professional who is concerned with the total welfare of the society of which he/she is an active participant, as well as being a competent physician. The nominee must have potential for service in the health care field, which can be demonstrated by, but not limited to, leadership in high school, undergraduate school and the community, knowledge of society and the problems and opportunities of the world today, and the individual's awareness of his/her own capabilities and limitations.” Each year the schools nominate an incoming student for one of the two \$20,000 annual awards. The nominee or family of the nominee must be a resident of North Carolina or South Carolina for the past five years. Final Selection is made by the Foundation. The award continues for the remaining three years of medical school based on the student maintaining satisfactory progress. On behalf of the four finalists, the Foundation awards a \$1,000 honorary stipend.

The Rauch Family Merit Scholarships, established in 2013 by the Rauch Family Foundation, are the first all-inclusive scholarships at the School of Medicine. The scholarships will be awarded to an incoming first year student who shows outstanding promise for a significant career in medicine. The merit-based scholarships will fund the approved cost of attendance as determined by the Duke Board of Trustees, which includes tuition, fees, transportation, and allowances for living and miscellaneous expenses. The scholarships continue through graduation as long as the student remains in good standing. Students are selected by the Executive Committee for Admissions during the regular merit scholarship selection process.

Office of Admissions Payment Policy for Students Who Do Not Hold US Citizenship or US Resident Status

Each non-US citizen admitted for enrollment at Duke University School of Medicine is eligible to apply for needs-based financial assistance at the time of admission. Financial aid eligibility is determined at the time a student is admitted and the student is notified of their eligibility prior to accepting admission into the School. Funds accepted by the student will credit to the student account. The amount disbursed is dependent on the number of terms a student is enrolled. It is the student's responsibility for paying all required tuition and fees on a semester/term basis.

For questions regarding this policy, please contact the Office of the Bursar, or the Duke University School of Medicine Office of Admissions.

Payment of Accounts

Statements for tuition, fees, and other charges are processed by the bursar's office. All statements are delivered electronically via ACES. You will receive an e-mail each time a new bill is ready for you to view on ACES. Fall bills will be due on August 3, 2015, and spring bills will be due on January 4, 2016. Please pay by e-check at www.bursar.duke.edu (click on the DukePay link on the right hand side of the main menu). If full payment is not received by the stated due date, a late payment penalty charge will be assessed on the subsequent statement.

Check payments can be mailed to Duke University, Bursar's Office—Payment Processing Center, PO Box 602538, Charlotte, NC 28260-2538. To ensure prompt credit to your student account, please include a copy of your bill when mailing your payment. This is our payment processing center at Wells Fargo Bank. Only payments should be sent to this address. Correspondence, scholarship checks, and overnight mail sent to this address will not be processed.

When drawing your check, make sure it:

- is payable in US dollars to Duke University;
- includes your name and student account number (from your bill);
- is from a US financial institution (such as Bank of America); or
- is from US branch of your financial institution (example: the New York City branch of Barclay's Bank PLC)

Your check will be deposited upon receipt.

If you are paying from abroad and are unable to send a US dollar check from a US financial institution, or if your bank is unable to provide you with a check drawn on its US branch, please submit your payment by bank wire. Wire instructions are included on the e-bill that is available to you on ACES. Duke University does not accept credit or debit cards for payment of tuition and fees.

Scholarship checks, overnight/express mail, and other correspondence should be sent to Duke University Bursar, PO Box 90759, 114 S. Buchanan Blvd., Bay 8, Room B-103, Durham, NC 27708.

Checks should be made payable to Duke University. Please write your account number on your check or money order. Please do not send cash. Payment by check should be made in US dollars, drawn on a check from a US financial institution.

Restrictions on Past Due Accounts

Tuition and fees are due before the start of each term. If your account becomes past due, a late payment penalty charge (not to exceed 1.25 percent of the past due balance from a prior bill) will be assessed on subsequent bills. If your account remains unpaid, you will not be allowed to register for future semesters and may be administratively withdrawn from Duke. As long as your account is past due, you will not have access to academic transcripts, be able to have academic credits certified, or receive a diploma at graduation. If your account remains outstanding after your departure from Duke, it may be referred to a collection agency and reported to a credit bureau.

Monthly Payment Plan

Duke University partners with Tuition Management System (TMS) to allow currently enrolled students and their parents to pay all or part of the academic term expenses in monthly payments as follows:

Fall balance	July 1-November 1
Spring balance	December 1-April 1

A nonrefundable fee is charged for TMS participation; this fee is paid directly to TMS. As a TMS participant, you will continue to receive statements on a regular basis from the bursar's office. This statement should reflect your TMS payments made to date. The balance due on your statement, which includes charges for the current term, must be covered by your remaining scheduled TMS payments for that term. Payments made to TMS for July 1 to November 1 must clear fall term charges; payments made December 1 to April 1 must clear spring term charges. If the balance due on your statement will not be cleared by your remaining scheduled payments for the term, please submit a payment for the difference directly to Duke. For more information, visit www.afford.com or contact TMS at (800) 722-4867.

MD Program Late Registration Fee

Failure to register during the prescribed online registration periods offered by the School of Medicine will result in a \$250 late registration fee. Any student who begins registration during or after the Drop/Add period of registration will be assessed this fee.

Delinquent Accounts

An individual is in default if the total amount due is not paid in full by the due date. A student in default is not allowed to register for classes, receive a transcript of academic records, have academic credits certified, be granted a leave of absence, or receive a diploma at graduation. In addition, an individual in default may be subject to withdrawal from school and have the account referred to a collection agency or credit bureau.

Refunds of Tuition and Fees

Tuition and fees refunds are governed by the following policy:

- In the event of death, a full refund of tuition and fees is granted.
- Students who withdraw from the medical school or are approved to take an official leave of absence before the end of the first week of classes (as determined by the calendar corresponding to the student's curriculum) receive a full refund of tuition.
- Students who withdraw or take leaves of absence after the first week of classes of their particular curricula receive no refund of tuition. However, if a student returns to the School of Medicine, that tuition payment is included in the total number required by the school.

Because Duke University participates in Title IV federal aid programs, it follows federal guidelines with respect to the refund and repayment of Title IV funds. Students will have their Title IV financial aid adjusted according to the federal regulations. Additional information regarding this procedure may be obtained from the Office of Financial Aid. Students are encouraged to sign up for direct deposit. (<http://finance.duke.edu/bursar/forms/index.php#ddr> or <http://www.bursar.duke.edu> and click the Direct Deposit icon).

Financial Aid Program

The Duke University School of Medicine makes financial assistance available to accepted students who, due to economic circumstances, could not otherwise attend the university. The School of Medicine is committed to meeting the demonstrated financial need of applicants based on federal and institutional policies and procedures. For our current academic year, approximately 85 percent of the total student enrollment received financial assistance from sources other than parents. Grants, scholarships, and loans from all sources to medical students totaled more than \$20 million. More than \$10 million of these funds were from Duke University School of Medicine scholarship/grant sources. Financial assistance is available in a combined form of grants and loans, and all awards are made on the basis of demonstrated need to eligible US citizens.

Financial Assistance to Incoming Students

Students should start the financial aid application process as soon as possible after January 1. Students are given information about this process at the time of their interview, and all students, regardless of their interest in financial aid, are sent information at the time of their acceptance. The economic circumstance of the applicant has no bearing on whether the applicant is accepted into the medical school.

Students applying for need-based funding are required to complete the Need Access and the Free Application for Federal Student Aid (FAFSA). Copies of federal income tax returns with all supplemental schedules and W2s for both parent(s) and student are also required as part of the financial aid application. Students applying for federal loans only should complete the FAFSA. An official aid award notice is e-mailed to the accepted applicant after receipt of the required forms.

Sources of Aid for International Students

The School of Medicine values the enrichment that comes from having talented international students participate in the medical doctor program, and recognizes that many may need financial assistance in order to participate. A limited amount of need-based institutional grant is offered to students who demonstrate financial need. Applications are due on April 1. Additional information regarding these grants, and how to apply, can be found at <https://medschool.duke.edu/education/student-services/office-financial-aid>.

Financial Assistance to Upper-Class Students

Annual reapplication is required of all need-based aid recipients. Typically, May 1 prior to the award year is the filing deadline. International students must reapply by April 1.

Financial Aid When Studying Away

Need-based financial aid is available during fourth year clinical elective years. A student receiving a research scholarship may also qualify for need-based financial aid funds. External scholarships are used to replace the loan package first.

Your new award will incorporate any research scholarship within your financial aid award in accordance with NIH, Duke SOM policies and federal financial aid regulations. Duke University School of Medicine policy dictates that all external scholarships replace loans first followed by need-based grants if necessary. This includes any merit scholarships as well. Total aid from all sources cannot exceed the established and board approved cost of education. Whenever aid exceeds cost, there is an over-award situation which is a violation of federal regulations (HEA section 673.5 (b) (2), 673.5 (d)). All effort has been made to ensure that you have all the financial aid to which you are entitled.

Need-based financial aid funds are not available for the added monthly cost at study away sites where cost is greater than if the student studies at Duke. Unsubsidized loans can be obtained for these additional expenses. Students are reminded that their refunds include any additional living allowances that may have been added to their budget. Every effort will be made to map refunds to expenses but students are expected to track their own spending habits to scheduled refunds.

External scholarship awards are typically disbursed in August and early January; however, students will want to verify with their scholarship source the actual disbursement calendar and make financial arrangements accordingly. The funds credited to the student account first go to pay any outstanding tuition or fees on the account. Any remaining balance will be refunded to the student. In the case of the Howard Hughes award, the research allowance

is allocated to the individual lab mentor through the Duke University Accounting system. They have fiscal responsibility for these funds, not the financial aid office.

For additional information, contact the Office of Financial Aid at (919) 684-6649 or finaid@dm.duke.edu.

Need-Based Aid

Grants

The School of Medicine is pleased to be able to offer grants to those students who qualify for need-based aid. The school recognizes, however, the responsibility of the individual and the family to provide funds to achieve the objective of a medical education. Thus, the school does not consider parents to have discharged the full financial obligation for the continuing education of the student upon the completion of the undergraduate degree. When being considered for a Duke grant, it is the responsibility of the student to provide all parental information to the financial aid office. This information is in the form of parents' tax returns/W2s from the most recent tax year and the Need Access Application, which the student fills out and submits online. It is important that the student submit their financial aid application as soon as possible in order to receive a financial aid notification prior to May 15. It is Duke's policy to calculate and assess each family a parental contribution each year. By accepting the award, you understand that this assessment will take place each year of your medical education. Situations may change for students during medical school—marriage, birth of children, etc.—but parental information is still required to be submitted for students to be considered for Duke need-based grants. Additional information is available at the financial aid website at <https://medschool.duke.edu/education/student-services/office-financial-aid>.

It is the responsibility of recipients of financial aid to keep the School of Medicine Office of Financial Aid informed of any outside financial assistance they may receive. It must be understood that the school reserves the right to reconsider its offer of financial assistance in the event of a major outside award to a recipient. No financial aid funds may be used during a period when the recipient is not involved with academic work toward the medical degree. Less than half-time or special students are not eligible for financial aid.

Loans

Federal Direct Grad PLUS Loan

The Federal Direct PLUS Loan is used to borrow additional funds up to the total cost of attendance, less other financial aid received. This loan is available to graduate and professional students and may also be consolidated with Direct Stafford loans upon graduation. A credit check is required for all Grad PLUS loans. Current interest rates and loan fees may be found at studentloans.gov.

Private/Alternative Loans

Private education loans are designed to assist students who need additional funding to meet the gap between the cost of attendance and any financial aid. Private loans are not part of the federal education loan programs. These loans carry a variable interest rate.

Federal Direct Stafford Student Loans

For purposes of Federal Direct Stafford Loans and other Title IV funds, graduate and professional students are financially independent of parents. The annual maximum for medical students is \$47,166. Loans disbursed after July 1, 2012, will not have any interest subsidy meaning the borrower will be responsible for the interest that will accrue during the enrollment period. Students must complete the Free Application for Federal Student Aid (FAFSA). Borrowers must be a US citizen or permanent resident, have no previous default on a federal loan, and be enrolled in at least half-time maintaining satisfactory academic progress. Duke University School of Medicine reserves the right to decline loan applications not having a satisfactory credit history. Current interest rates and loan fees may be found at studentloans.gov.

University Loans

The School of Medicine has an emergency loan fund, the Francis and Elizabeth Swett Loan Fund, available in small amounts to any medical student on a no-interest basis for a short period of time. The emergency loan is not intended for tuition payments.

Additional information may be obtained by contacting the Office of Financial Aid, Box 3067, DUMC, Durham, NC 27710; (919) 684-6649; or finaid@dm.duke.edu.

Resources with Service Commitment

Board of Governors' Medical Scholarship-Loan Program (BGMSL)

BGMSL provides financial support to North Carolinians studying medicine at Duke University School of Medicine, Brody School of Medicine at East Carolina University, the University of North Carolina at Chapel Hill School of Medicine, or Wake Forest University School of Medicine. Students receive a \$5,000 stipend plus tuition, mandatory fees, and mandatory medical insurance. For additional information, please visit <http://www.ncseaa.edu/BGMSL.htm> or call College Foundation of North Carolina, at (866)866-CFNC (2362).

Forgivable Education Loan for North Carolina Residents

The loan provides financial assistance to qualified students who are committed to working in North Carolina in fields designated as critical employment shortage areas. Additional information can be found at <http://www.cfnc.org>.

Primary Care Loan (PCL)

Recipients must agree to enter and complete a residency training program in primary health care not later than four years after the date on which the student graduates from the school, and must practice in such care through the date on which the loan is repaid in full.

If the borrower fails to complete a primary health care residency and to practice in a primary health care field, the loan balance is recomputed from the date of issuance at an interest rate of 7 percent per year, compounded annually. This 7 percent loan is available on a limited basis for qualified borrowers.

Federal Armed Forces Scholarships

Armed Forces (Army, Navy, and Air Force) scholarship programs may be available for accepted or enrolled students. The recipient receives full tuition, fees, and a monthly stipend in return for a commitment of service as a physician for each year of funding.

Awards and Prizes

Typically these are awarded at graduation for the top students in a given area.

Andrew C. Puckett Essay Contest

In honor of Dr. Andrew C. Puckett, associate dean emeritus of the School of Medicine. The topic is chosen each year by Dr. Puckett. The award is chosen by a committee with Dr. Puckett participating in the selection. Prize consists of a certificate and award for \$500.

Davison Scholarship

The Davison Scholarship award is supported by the Davison Club in the memory of Dean Wilburt Davison to enable a medical student to participate in a clinical science elective outside the United States in an area of primary care. Any student eligible to study away may apply for the award. For consideration for the scholarship, the elective must be approved by the Study Away Committee.

Dean's Recognition Award

In recognition of contributions made to the school and the class in leadership and service as well as academic performance, this award, which consists of a certificate and a monetary award, is given to four to six graduating seniors.

Excellence in Emergency Medicine

Selected by the faculty in the division of Emergency Medicine to a student who has demonstrated outstanding proficiency in emergency medicine. One-year subscription to the Society for Academic Emergency Medicine journal, *Academic Emergency Medicine*, one-year subscription to *SAEM Newsletter*, one-year complimentary membership in the SAEM.

Thomas Jefferson Award

This award, consisting of \$200, a certificate, to recognize a graduating senior student who has made outstanding contributions to the university or to fields which have not been traditionally confined to science and medicine. The award is given by the awards committee to a graduating senior.

The Richard Schatz Travel Scholarship

This award was established by Dr. Schatz to benefit medical student who wish to study abroad. He is a Duke alum and has committed \$10,000 each year for study outside the continental United States in order to broaden students' experience both in a medical and a general way by observing points of view, conditions and medical practice in other countries. The recipient will be designated a "Schatz Scholar."

Leonard Tow Humanism in Medicine Award presented by the Arnold P. Gold Foundation

The Humanism in Medicine Award is a national award given to a graduating senior at each US medical school by the Arnold P. Gold Foundation, a charitable foundation based in New Jersey, that has as one of its missions the development and recognition of humanistic physicians. The criteria for this award include that the recipient consistently demonstrates compassion and empathy in the delivery of care to patients, illustrates professional behavior by example, shows respect for everyone and is committed to continuous self-improvement. Nominations are solicited from the graduating class and the recipient chosen by a panel that includes previous faculty recipients of the award and the advisory deans. The award consists of a certificate and a monetary award of \$1,000. The companion award is presented to a faculty member at the annual faculty awards ceremony.

Other Awards

Throughout the year, the School of Medicine receives notification of awards consisting of books, money, and/or plaques or medals to be awarded to students in a variety of fields at all medical schools on a national competitive basis selected by committees of the sponsoring organizations. These awards are screened by the dean's office and publicized appropriately.

Third Year Research Scholarships

Overview

A variety of research scholarships and research programs are available to support medical students in their year of individual scholarly activity. Most of these require a full twelve-month commitment to research. Students may apply for multiple external scholarships as well as internal scholarships offered by departments at Duke. All scholarships and programs involve a competitive application process.

The brief descriptions below include the currently approved external and internal scholarships and program details and contact information. Applications to external scholarship programs are often due in January, and applications to internal scholarship programs are due April 1. There are a few exceptions to these deadlines. Further questions can be directed to Renee Mahaffey in the Office of Student Affairs at 684-5901 or renee.mahaffey@duke.edu.

External Research/Scholarship Programs

Doris Duke International Clinical Research Fellowships in Global Health. Duke is one of six institutions to receive an international research grant from the Doris Duke Charitable Foundation. (The others are Harvard, UCSF, the University of Minnesota, UNC and Yale.) The Doris Duke Fellowship at Duke will support clinical research at two sites: Moshi, Tanzania and Eldoret, Kenya. For more information, contact Dr. Dennis Clements at dennis.clements@duke.edu or go to the Doris Duke website at <http://www.ddcf.org>.

Howard Hughes Medical Institute (HHMI) Research Fellows Program. Hughes fellows may work in any laboratory of their choice (excluding the NIH) including those within their own medical school. Selection of a mentor is key to the application process. The application, which includes a research plan and a letter from the mentor, must be submitted by January 10, 2016. Students receive an annual salary of \$28,000. In addition, students will receive a \$5,500 allowance for research or education-related expenses that directly benefit the fellow, and a \$5,500 fellow's allowance to defray health insurance and tuition costs. For additional information and application, visit <http://www.hhmi.org/grants/individuals/medfellows.html>.

Intramural Research Program at the National Institute of Environmental Health Science (NIEHS). Two "Fellowships in Environmental Medicine" were offered in 2015. To apply, review Principal Investigators and their research areas using the link to all NIH intramural programs – <http://irp.nih.gov/our-research/our> programs. Choose a preceptor and contact that person regarding their project opportunities and their interest in accepting a third year medical student. If they are willing, between the two a plausible research project must be created, with a reasonable

chance of completion in 12 months. Research should have an “environmental medicine” theme. Contact clinical director Stavros Garantziotis (NIH/NIEHS) at garantziotis@niehs.nih.gov. The stipend is approximately \$28,000.

National Institute of Health (NIH) Medical Scholars Program. The program offers research experiences with intramural investigators from across NIH in basic science laboratories, and in clinical and translational research conducted at the NIH Clinical Center, the world’s largest hospital dedicated to patient-oriented research. Program applications will be accepted October through mid-January. Student support will include a \$33,700 stipend, and resources for education enrichment, such as travel to scientific meetings. For more information on the NIH Medical Research Scholars Program, please visit the NIH Clinical Center’s Office of Clinical Research Training and Medical Education website at www.cc.nih.gov/training/mrsp.

The VECD Fogarty Global Health Fellowship. The Global Health Fellowship Program is a one-year clinical research training program for pre- and post-doctoral candidates, sponsored by the Fogarty International Center (FIC) and several collaborating institutes and centers at the National Institutes of Health (NIH). The purpose of the program is to support a one-year mentored research fellowship for clinical investigators studying diseases and conditions in developing countries. Several training sites are available through the Vanderbilt-Emory-Cornell-Duke (VECD) Consortium. Applications are due December 1. For more information, please go to <http://www.vecd.org> or contact Cecelia Pezdek (cecelia.pezdek@duke.edu) of the Hubert Yergan Center for Global Health at Duke.

Sarnoff Cardiovascular Research Foundation. The Sarnoff Fellowship Program offers medical students enrolled in accredited US medical schools the opportunity to spend a year conducting intensive work in a biomedical research laboratory. Applications are encouraged from all interested medical students, whether or not they have prior research experience. Applicants enrolled in an MD/PhD program are not eligible for a Sarnoff Fellowship. Fellowship awardees receive an annual stipend of \$30,000, in addition to an allowance for travel to select a preceptor and fellowship laboratory, moving expenses, health insurance, computer and laboratory supplies, and travel to scientific meetings. For more information, contact Dr. Neil Freedman at neil.freedman@duke.edu. Applications must be submitted online at http://www.sarnofffoundation.org/?page=Fellowship_Info.

Internal Scholarship Programs

Students applying for the Duke Internal Scholarships listed below should use the [Internal Duke Scholarship Application form](#). Most Internal Scholarships applications are due April 1. Announcements are generally made in April or May.

Basic Science Research Scholarships. Two \$5,000 scholarships for students conducting their third-year research in a laboratory associated with the Molecular Genetics and Microbiology department (MGM)—Duke School of Medicine Basic Science Department. These scholarships are restricted to laboratories of primary faculty in the department. (Please note it is expected that MD/PhD candidates and students receiving significant external scholarship funds (e.g., HHMI fellowships) will not be eligible for these small scholarships.) Please contact Joanna Downer, PhD, for more information at joan-na.downer@duke.edu or (919) 681-8272.

The Donald B. Hackel Fellowship. The Donald B. Hackel Fellowship in Cardiovascular Pathology provides for research in vascular biology under the direction of a full-time faculty member whose primary appointment is in the Department of Pathology. This twelve-month fellowship carries an annual stipend of \$15,000. For further information contact Dr. William Bradford at bradf001@mc.duke.edu.

The Duke CTSA Scholarship is a two-year scholarship funded by the Clinical and Translational Science Award (CTSA). CTSA scholars will complete two years of mentored clinical research and the Duke Clinical Research Training Program (CRTP). Upon successful completion of all CRTP degree requirements, CTSA scholars will graduate from Duke University with a Master of Health Sciences in Clinical Research (MHSc). The scholarship provides a stipend for each full year of study. Additional funds are applied toward CRTP tuition, insurance costs, and travel expenses to scientific meetings. CTSA scholars will graduate from Duke medical school a year late. The application deadline is April 1. Please note that CTSA funding is pending. For the 2015-16 scholarship period, all scholars will be interviewed for the DTMI one year scholarship, and the CTSA scholarship will be awarded to interested and qualified individuals when funding is available. Please indicate your interest in the CTSA on the application. For further information, contact Stephanie.molner@duke.edu or go to <https://www.dtmi.duke.edu/dtmi-teams/education/ctsa-scholarship-predoctoral-students-t11>.

The Duke Translational Medicine Institute (DTMI) Scholarship is a one-year scholarship funded by a Pfizer Foundation grant to Robert Califf, MD, the director of the DTMI. DTMI scholars will complete one year of mentored clinical research and the core Duke Clinical Research Training Program (CRTP) coursework curriculum. Upon successful completion of all requirements, DTMI scholars will receive the “Academic Core in Clinical Research” certificate. The scholarship provides CRTP tuition. The application deadline is April 1. For further information, please contact Stephanie.molner@duke.edu or go to <https://dtmi-plone.dcri.duke.edu/for-researchers/training-education/mentored-training-and-career-development-programs/dtmi-scholarship-for-medical-students>.

Duke Global Health Institute. The Third-Year Global Health Study Program takes advantage of the School of Medicine’s unique curriculum to allow medical students to take their entire third year for research activities. Additional internal scholarships are available however they require a different application. For more information contact the Global Health Third Year Study Project Coordinator, Brian Seavey at gh-thirdyear@duke.edu or visit their website at <http://globalhealth.duke.edu/education/graduate-professional/md-third-year-track>.

Duke OHNS/DCRI Clinical Research Training Fellowship. This one-year fellowship focuses on Otolaryngology Head and Neck Surgery/Communication Disorders. The research proposal should include a description of interests and general research ideas. Interviews are required, and the start date is July or August of the research year. The stipend is \$22,032, plus \$16,000 in tuition support (the student is responsible for taxes). Application deadline is October 28, 2016. Go to the website link: <http://www.entnet.org/content/clinical-research-training-programs>.

Duke-Singapore Student Scholar Fellowship. A student may choose to do a 10-month scholarly experience doing mentored clinical or basic science research in Singapore, a country on the cutting edge of biomedical and health services. Opportunities for outreach in neighboring Asian countries are also possible. This research will take up 80%+ of the Scholar’s time. Singapore Scholars are also expected to provide mentoring to Duke-NUS students (6-8 hours per week). This may involve tutoring first or second year students; serving on various curriculum committees (first, second and/or third); facilitating small group or one-on-one discussions about first and second year students’ experiences with the curriculum; and/or sharing their experience of third year research. As a Singapore Scholar you will receive SGD20,000 (roughly \$14,380) tuition support, two Duke-Singapore coach round-trip airline tickets during the year, living expenses of SGD3,200/month (roughly 2,300). In addition, temporary living expenses to assist the move to Singapore will be reimbursed up to SGD75 per day (roughly \$54) for up to two weeks. (The amounts stated in Singapore dollars can be converted; go to <http://www.xe.com>.) Support will be for 10 months of the research project. For more detailed information, please contact Deidra Morris at (919) 613-1709. The deadline is usually January 31 and applicants are notified in early March.

Eugene A. Stead Student Research Scholarships. Dr. Eugene A. Stead, Jr. served as chair of the Department of Medicine at DUMC from 1947 to 1967. The Stead Scholarships are the oldest of the Internal Scholarships. The Stead Scholarship Committee typically awards three to five scholarships annually, with a focus on third-year students who are working with basic science mentors and mentors with a primary appointment in the Department of Medicine. There are also scholarships for students interested in Global Health, which are offered jointly with the Hubert-Yeargan Center for Global Health. The research stipend is typically \$25,000. For further information you can contact Christopher Woods, MD, MPH at (919) 668-7174.

Interdisciplinary Research in Medicine or Physiology (Hyperbaric Medicine). This scholarship is currently unavailable.

Ovarian Cancer Research Fellowship. The Ovarian Cancer Research Fellowship in Gynecologic Oncology is offered to one third-year Duke University medical student annually. The broad aim of the laboratory group in which the student will work is to elucidate the molecular pathogenesis of ovarian cancer and to translate this knowledge into prevention strategies. This ten-month fellowship carries an annual stipend of \$7,000. Students who aspire to careers in obstetrics and gynecology will have the highest priority in judging applicants for this award, but this should not discourage others from applying. If you have questions, contact Dr. Andrew Berchuck, MD, professor of Obstetrics and Gynecology, Division of Gynecologic Oncology, Box 3079 DUMC, Durham, NC 27710.

R. Randall Bollinger Surgical Scholarship. The Department of Surgery offers research scholarships in surgery for third-year students at Duke University Medical Center. Funding is variable but has ranged from \$3,000 to \$10,000 per year in the recent past. Ideally, students will be expected to publish their findings in peer-reviewed

journals and to present their research at regional or national scientific meetings. Accepted applicants will be expected to interview and present a brief presentation in April for consideration. For more information, contact Ranjan Sudan at ranjan.sudan@duke.edu.

Ruth K. Broad Foundation Medical Fellow in the Neurosciences. The Ruth K. Broad Biomedical Research Foundation, a support corporation of Duke University, is offering an award to promote learning and research in the neurosciences for one Duke medical student. This will be the first time the organization has offered an award specifically for medical students. The award will support twelve months of full-time biomedical research training during the third year of the MD degree program. Applicants must be enrolled at the School of Medicine, applying to pursue laboratory-based research (basic or translational, biomedical engineering, etc.) relevant to neurodegenerative disease. The award will provide \$38,000 that will accrue to the student's medical school account, and will be attributed toward tuition, fees, and possibly a research allowance. The award will be open to student projects based on merit, regardless of whether the principal investigator has a primary appointment in a basic science department, or is an MD or PhD. The fellowship research may be conducted at another US academic institution with 501(c) (3) status, with the approval of the student's academic advisor along with approval of the mentor at the host lab. The recipient may be asked to present findings at an annual RKBF board meeting, and will be asked for a written report at the end of the funding period. The application deadline is in February and applications are submitted directly to the foundation. Application information is available online at <http://sites.duke.edu/broadfoundation/medical-fellow-in-the-neurosciences/> or e-mail the foundation at ruthkbroadfoundation@mc.duke.edu.

Financial Aid and Scholarships. Need-based financial aid is available during the third-year basic science elective and fourth-year clinical elective years. A student receiving a research scholarship may also qualify for need-based financial aid funds. Your award will incorporate the scholarship along with your financial aid award in accordance with NIH, Duke SOM policies, and federal financial aid regulations. Duke University School of Medicine policy dictates that all external scholarships replace loans first. At such time that these loans are replaced in full, then the grant portion of your aid award will be reduced. This includes any merit scholarships as well. Total aid from all sources cannot exceed the established and board-approved cost of education. Whenever aid exceeds cost, there is an over award situation which is a violation of federal regulations (HEA section 673.5 (b) (2), 673.5 (D)). All effort will be made to ensure that you have all the financial aid you are entitled.

Need-based financial aid funds are not available for any added monthly cost at study away sites where living expense is greater than if the student studies at Duke. Unsubsidized loans can be obtained for these additional expenses.

Third Year Scholarship Students' Ability to Enroll in Coursework

Students who have been awarded scholarships for third-year research should be aware that some scholarships will not allow coursework while involved in scholarly research funded by a specific scholarship. As an example, the Howard Hughes Medical Institute (HHMI) agreement and contract states that "fellows may not undertake medical school coursework, a clerkship, or any graduate school coursework."

All third-year students are required to satisfy the third-year practice course/continuity clinic. When a scholarship prohibits doing coursework for credit, this requirement may be satisfied by an approved outpatient course during the fourth year, with approval of the student's mentor, study program director, advisory dean, and the Practice Course director. Some students involved in specific study programs are also required to enroll in specific courses related to that lab experience. In no instance, however, should a scholarship recipient enroll in courses without the specific permission of the study program director and their research mentor.

Students should be aware that taking courses during a period when they are not allowed may lead to loss of scholarship support, loss of credit, or other adverse measures.

Doctor of Medicine Program Policies

Absences

Excused absences

Students must request and negotiate excused absences from required course activities with the director of a course or clerkship in situations such as illness or health care appointments, attendance at scientific or professional

meetings, personal or family emergency, or major life events. Course directors are responsible for making clear to students which portions of their courses require attendance and any limit on excused absences without negative consequence. These absences should be negotiated in writing (e-mail or letter) as far in advance as possible and a plan established for completion of any activity or work missed. Requests made on short notice for previously planned absences will likely be denied. Absences announced on short notice due to illness or emergency may still be excused with proper notification of the course director or advisory dean, and unannounced absences may be excused in cases of incapacitation to the point of inability to make these contacts. (Please refer to [“Time Away Requests for Second-Year Courses”](#))

Unexcused absences

Any absence without prior notification of the course director or advisory dean is considered unexcused unless documentation of inability to make those contacts is provided. Any absence not approved by a course director for a required part of a course is considered unexcused. An unexcused absence will have a negative impact on the student’s grade or evaluation, and may result in a Code of Professional Conduct charge if deemed unprofessional behavior.

Academic Calendar Approval Process

The School of Medicine’s Registrar’s Office formulates the academic calendar for the School of Medicine annually. This process begins in mid-August and a draft of the proposed academic calendar for the School of Medicine is presented to the subcommittees for each academic year and the Curriculum Administration Group for review. Upon their review and recommendations, the calendar is submitted to the Curriculum Committee for approval during the October meeting. Upon approval by the Curriculum Committee, the academic calendar is considered official and no changes will be made to the calendar during that academic year.

The academic calendar is published on the School of Medicine Registrar’s Office [website](#).

Academic Dismissal Policy of the Duke University School of Medicine

Accepted by Duke University School of Medicine Curriculum Committee, May 2010.

- A student who fails a course, clerkship, or elective will be placed on academic probation. Any of the following circumstances will result in dismissal:
 - Failure of any combination of three classroom-based/clinical setting-based /clerkships/electives (includes clerkships, electives, and selectives) courses
 - Failure of two (clinical setting-based courses) clinical courses
 - Failure of the same course twice

Academic Standards

The faculty of the Duke University School of Medicine has the responsibility to define minimum acceptable standards for academic performance. In all courses, minimum passing standards are defined by the course director in collaboration with his or her department chairperson and faculty. These standards are communicated to the students at the beginning of each course. In all courses, acceptable professional standards of behavior and attitudes are included in the performance evaluation.

Faculty has the responsibility of notifying students who are not meeting minimal standards for passing a course as soon as it becomes evident, early enough to allow the student to be able to work toward achieving the minimal standard. Students who are not meeting minimum standards should meet with the course instructor and advisory dean to develop a plan of action.

In addition to performance directly related to course requirements, all students must maintain a high standard of professional behavior. High standards are described in the [“Payment Policy for Students Who Do Not Hold US Citizenship or US Permanent Resident Status”](#) policy. The number of such reports, failure of a course, the severity of the transgression, and other aspects specific to the behavior in question can result in disciplinary action, including dismissal from medical school.

Appropriate Treatment of Learners at Duke University School of Medicine

Policy Statement

Duke University School of Medicine (SOM) is committed to creating and maintaining a positive learning environment for learners that is respectful and appropriately attentive to their learning needs and free from conduct

by teachers that could be interpreted by learners as mistreatment. Behavior that violates this stated expectation will be investigated, and if found to represent mistreatment, may become the subject of disciplinary action by the SOM.

Policy Rationale

The SOM adopted in 2002 the “Compact Between Teachers and Learners of Medicine” as articulated by the AAMC and this additional policy is designed to clarify and expand on the goals articulated there. Both documents are based on the premise that students learn how to be professionals by observing and imitating their role models, and that therefore the teachers of a medical school have an obligation to convey professional values by demonstrating appropriate standards of behavior.

This policy is not intended to abridge the academic freedom of teachers, and will be applied in a manner that protects those freedoms. It is consistent with the “Statement on Faculty Professionalism” of the School of Medicine, the “Duke Medicine Code of Conduct: Integrity in Action”, and the “Harassment and Discrimination Policy” of Duke University. Under the “Policy on Appropriate Treatment of Learners at Duke University School of Medicine”, students could be considered teachers or learners, depending on the role they play in any specific situation.

Policy Standards

Conduct that is expected of those in a teaching role includes:

- Taking responsibility for learners assigned to one’s course or service, and ensuring a safe, fair, supportive, unbiased learning environment that respects learners’ physical and social boundaries and encourages their development as medical professionals
- Clearly communicating expectations, and applying consistent evaluation and grading methods which are communicated in advance of learner performance
- Assigning tasks to learners based on their knowledge, skills and experience
- Providing supervision and appropriate remediation when learners are not adequately prepared
- Providing feedback to learners in a timely, constructive, personalized and explicit manner
- Abiding by the Duty Hours Policy and other policies of the SOM
- Adhering to Duke University’s policies on Harassment and Consensual Relationships
- Examples of conduct that is considered inappropriate in a teaching role include, but are not limited to:
 - Threatening or intimidating behavior or words (e.g. verbal threat of intent to harm, making a gesture as if to strike, screaming or yelling at a learner, standing over a learner or getting “in your face”)
 - Using obscenities, profanity, or racially/culturally-derived/gender-based terms or names directed at a learner, OR using such verbal expressions so as to create a negative environment even if not directed at the learner. (e.g. cursing at a learner or other members of the team, using a gender- or racially-charged epithet to refer to a learner)
 - Using threatening or obscene gestures, cartoons, or jokes in the presence of a learner
 - Degrading a person or group on the basis of a personal or cultural characteristic (e.g. “people like you are all stupid”, “your people all expect me to read your minds”, “I can’t believe you want to go into specialty X and become a drone”)
- Ignoring learners assigned to you or failing to complete assigned learner evaluations
- Requiring learners to perform personal services at any time (e.g. get me coffee, pick up my laundry, pet-sit this weekend, pick up something I forgot in my office, listen to my personal problems)
- Inviting learners who are being currently supervised, evaluated, or graded to romantic or sexual relationships; sexual assault, or sexual or gender-based discrimination or harassment through words, gestures, and behaviors (e.g. inviting on a date, commenting repeatedly on attractiveness or clothing, making sexually suggestive comments or gestures)
- Taunting, mocking, or humiliating a learner through acts and words (e.g. mimicking something the student got wrong, giving highly pejorative feedback in the presence of others)
- Using aggressive questioning to the point of badgering or humiliation in the guise of the “Socratic method” (e.g. after questioning the student to the limits of his/her knowledge, persisting in asking the same question the student can’t answer or more difficult questions for the purpose of humiliation)
- Endangering the safety of a learner (e.g. inflicting physical harm, requiring the learner to go somewhere unsafe or to be exposed to dangerous objects or substances without education and proper protection, asking learners to perform tasks they are not trained to do, telling a learner not to report an occupational exposure)

- Endangering the learner's professional development (e.g. telling learners to ignore institutional or school policy, inviting learners to do something unethical or illegal)
- Grading based on factors other than performance on previously announced grading criteria; creating disadvantage in learning opportunities, teaching, feedback or grading based on personal characteristics of the learner (e.g. giving a better grade because someone is going into your field or you like him/her best)
- Acting in retribution against any learner who reports perceived inappropriate treatment (e.g. telling others that a learner is a "snitch" or to "watch out for that one", giving the learner a grade less than s/he deserves, calling a residency program to "warn" them about a learner)

Reporting of Inappropriate Treatment in the Teacher-Learner Relationship

Perceived inappropriate treatment of a learner, either experienced or witnessed, should be reported by using one or more of the following methods:

- verbally or in writing to the course director of the learner's course
- verbally or in writing to the advisory dean or personal advisor of the learner
- in a mandatory end-of-course evaluation
- in other internal surveys done by the learner's program
- on the Adverse Events website for the SOM (can be anonymous)
- to a member of the Committee on Appropriate Treatment of Learners (CAT)
- to the SOM or University Ombudsperson

Conduct that may be a violation of the university's [Harassment Policy and Procedures](#) must be reported to the [Duke University Office for Institutional Equity](#).

Investigation of Reports of Inappropriate Treatment of Learners in the School of Medicine

All reports of inappropriate treatment of learners will initially be evaluated by the Committee on Appropriate Treatment of Learners (CAT) for an initial determination of merit; conduct that may be a violation of the [Harassment Policy and Procedures](#) (including sexual harassment, domestic violence, dating violence, and stalking) will also be addressed by the [Office for Institutional Equity](#). CAT will service as a repository of reports from all sources and will therefore track whether multiple reports of inappropriate treatment by the same individuals occur. If a report warrants and provides enough information to support further investigation, CAT will conduct that investigation. If requested by the learner, the timing of this investigation can be adjusted to protect the learner. If an investigation reveals that inappropriate treatment has occurred, the matter will be referred to the Chair, Residency Program Director, Course Director, or supervisor of the individual involved for potential disciplinary action and for a report back to CAT of what action was taken to ensure that the behavior will stop. For example:

- Investigations of inappropriate treatment by students who are in a teaching role can be handled as potential breaches of professionalism and can be reported on a Professionalism Notification Form to the student's advisory dean or reported to a school official as a potential Code of Professional Conduct violation.
- Investigations of inappropriate treatment by residents who are in a teaching role will be reported to the Residency Program Director and/or Vice Chair for Education or Chair of the relevant clinical department.
- Investigations of inappropriate treatment by faculty who are in a teaching role will be reported to the Vice Chair for Education or Chair of the relevant clinical department and may ultimately be reported to the Dean's Advisory Council on Faculty Conduct.

CAT will determine an appropriate deadline for reporting of actions taken based on the urgency of the situation. If CAT is not satisfied that an appropriate action has been taken to prevent future inappropriate treatment by a teacher, it will report its concern to the Vice Dean for Education for further action. In all cases, CAT will report back to the person who reported the inappropriate treatment, if identified, that action has been taken on his/her report, though specific details of that action will not generally be revealed.

Confidentiality of Reporting Mechanisms

While there are several anonymous and confidential ways to report inappropriate treatment of learners, full disclosure of the persons involved and the behaviors witnessed can lead to more effective action to correct the problem. Therefore, we encourage full reporting of incidents of inappropriate treatment of learners and people involved in them. However, anonymous reports will also be investigated to the extent that specific information is provided. The identity of learners reporting inappropriate treatment can often be protected by delaying action on the report until the learner is no longer vulnerable, or by collating reports so that individuals cannot be identified. The School and the University will keep confidential all records of complaints and investigations to the extent permitted

by law. However, *discrimination, harassment (including sexual violence), domestic violence, dating violence, and stalking must be reported by any University official to the Office for Institutional Equity so that they can be promptly acted upon in order to be compliant with Federal Law. This does not mean that the full complaint process will automatically take place. Rather, the Office for Institutional Equity will contact the learner(s) as part of determining what steps to take.*

Protection of Rights of those Reporting Inappropriate Treatment

The success of this policy and procedures in safe-guarding the learning environment depends on the timely reporting of incidents of inappropriate treatment. In all cases, retaliation, or the encouragement of another to retaliate, against the person making such a report or the learner involved is strictly prohibited and, if found to exist, would become the focus of an investigation and sanctions.

Protection of the Rights of those Accused of Inappropriate Treatment

Intentional false or malicious reports of inappropriate treatment by learners will not be tolerated and will be handled as a disciplinary matter in the learner's program. All reports of inappropriate treatment will be handled confidentially with the exceptions noted above, and in a manner that affords the accused due process.

Attendance Policy

Students in the MD curriculum of the Duke University School of Medicine are expected to attend all classroom, clinical, and laboratory activities of their curriculum with these exceptions:

- Activities that are clearly identified by the course director as non-mandatory attendance activities,
- Activities for which the individual student has received permission in advance from the course director for an absence, and which may or may not require make-up work,
- Activities for which the student is unexpectedly unable to attend due to illness, accident, or other emergency and for which the student has notified the advisory dean, course director or designee of the reason for the absence, and which may or may not require make-up work.

Attendance policy for individual courses is set by the course director(s) and should be made explicit, with consequences for non-attendance, and communicated to students at the beginning of a course. Students may negotiate with individual course directors for absence due to personal events or needs, and reasonable advance requests for absence due to appointments and events that must occur during curricular time should be granted (doctor and dentist appointments, court appearances). For other requests, course directors should take into account the nature of the activity (does it enhance the student's curriculum, is it a once-in-a-lifetime opportunity), the amount of control the student has over the scheduling of the event, the impact of missed time on the curriculum, the student's performance in the class, and the availability of equivalent experience through make-up activities. The course director's decision in these requests is final.

Attendance Requirements for Medical Students—Holidays

Students in the School of Medicine are to observe approved holidays as outlined on the School of Medicine Academic Calendar. Holidays that occur on a Saturday may officially be observed on the preceding Friday. Official School of Medicine holidays occurring on Sunday will be observed on the following Monday. Second- and fourth-year medical students that are completing clinical rotations and scheduled for the weekend or evening shifts (or call) prior to the scheduled and approved holiday, must complete their scheduled shift. For example, a holiday observed on the Monday after the actual holiday, a course instructor and/or department may schedule the student to be on the wards until the end of their shift.

Course Audit

With the consent of the appropriate instructor, fourth-year students are permitted to audit one course a semester in addition to the normal program. Students who audit a course do not actively participate, submit work, or receive credit for the course. Because of the nature of an audited course, most clinical science courses cannot be audited. However, those offered in a lecture format (as indicated in the electives book provided to fourth-year students) may be audited with the written permission of the instructor. After the first week of classes in any term, no course taken as an audit can be changed to a credited course and no credited course can be changed to an audit. Further, an audited course may not be repeated for credit.

Course Evaluations

Course evaluations are an integral element of the assessment process. As such, all students are required to complete a course evaluation for each course. Failure to do so may result in disenrollment from current or subsequent courses. For more information contact the Office of Curricular Affairs.

Due Process Guidelines

If a student decides to appeal a decision of a promotions board, he or she must submit in writing to the Vice Dean the reasons for the disagreement with the decisions and any extenuating circumstances he or she wishes to identify within two calendar weeks of receiving notice of the decision. Within a week of receiving the appeal, the Vice Dean appoints a Promotions Appeal Committee of three senior faculty. The Promotions Appeal Committee reviews the student's request and meets with other faculty or members of the Duke Medicine faculty or staff who have pertinent information. The student may present her or his appeal in person and may bring a friend from the faculty or student body to assist. The Promotions Appeal Committee reports its decision to the Vice Dean who presents this to the student. If the student still is dissatisfied and wishes to appeal further, he or she may request a review of the process by the dean of the School of Medicine, with all pertinent documentation provided to that office. The dean's decision is binding.

Duty Hours Policy

The Duke University School of Medicine has adopted a duty hours policy for medical students to provide guidance and protection for students, especially on the clinical services in the second and fourth years of the curriculum. It is recognized by faculty and students that the goals of educating students in the clinical setting are both the development of their clinical skills and professional attributes and the provision of student contributions to medical teams and the care of patients. It is the intent of this policy to support the achievement of these goals while allowing students adequate time to rest, attend to extracurricular obligations, and recreate in order for them to be maximally effective as learners.

Statement of Duty Hours Policy

- Students will be expected to be on-site on any clinical service no more than eighty hours per week, averaged over a two-week period during second year clerkships and a four-week period during fourth-year courses. This maximum should include actual time spent on service in the hospital or clinic on "on-call" nights, but should not include time a student may spend at home reading or studying, or sleeping in the hospital while on call. Exceptions to the eighty-hour limit can be made for unique learning opportunities that may arise (e.g. an unexpectedly long surgical case, an unanticipated transplant surgery, awaiting an obstetric delivery, etc.), but should not become routine. Extensions may be granted for situations in which a student's supervising residents are allowed longer hours by national accreditation agencies (e.g. eighty-six hours in neurosurgery).
- Students will have one full day completely free of curricular or patient-care responsibilities in the hospital or clinic per week, averaged over a two-week period during second-year clerkships and over a four-week period during fourth-year courses. Weekends off after a course ends may be included as days off for the preceding two-week period only. School holidays that occur during a course may be included as days off for the two-week period in which they fall.
- Students will not be expected to be in the hospital or clinic setting for more than thirty consecutive hours, including hours spent sleeping while on call if less than four hours.
- In conjunction with the restrictions on total time spent in the hospital or clinic, course directors should design learning activities to make the most efficient use of time from the standpoint of learning. Learning activities appropriately include
 - the care of patients assigned to the student, the student's team, or services being cross-covered, and other activities that are the work of the student's team, and
 - classes, conferences, rounds, projects and individual learning assignments that are part of a course.
- Students should not be expected to use the hours allocated on tasks that are not directly related to learning activities (e.g. performing personal favors or services for other medical personnel), nor should they be expected to do tasks unrelated to their learning activities (see 4a) solely because residents must leave due to work hours restrictions.

- Students will be expected to keep an accurate log of time spent in the hospital/clinic and provide the log to an office designated by the Office of Curricular Affairs. Intentional falsification of logs will be treated as an Honor Code violation. Course directors review cumulative, nonstudent-identifiable duty hours data twice a year and correct any systemic problems that are contributing to students regularly working excess hours on their rotations. Students will not be penalized for accurate reporting, nor will information from student logs be used in any way in determining grades or evaluations.
- The Office of Curricular Affairs will compile a bi-annual for the Clinical Course Directors including the average duty hours per week on individual rotations and, the number of reports of excess duty hours data and correct any systemic problems that are contributing to students regularly working less hours on their rotations. Students will not be penalized for accurate reporting, nor will information from student logs be used in any way in determining grades or evaluations.

—Approved by the Curriculum Committee on September 4, 2006

E-mail, Official Means of Communication

Duke University School of Medicine uses e-mail as an official means of communication with students. Deans, faculty, and administrators will generally employ your Duke e-mail address (@duke.edu) when reaching out to you, and you are expected to check your Duke e-mail account on a regular basis and to respond in a timely fashion. If you have your @duke.edu forwarded to a different e-mail address, it is your responsibility to insure that important and time-sensitive communications are not lost. Failure to read and respond to official e-mail in a timely fashion can have serious consequences for you.

Fail Grades for First Year

If a grade of “Fail” is received in a course, either because of major deficiencies in meeting course requirements or failure to clear an “Incomplete” grade as described, the “Fail” grade will become a permanent part of the student’s transcript. With the course director’s advice and consent, the promotions committee may recommend to the Vice Dean that the student remediate the course prior to promotion to the next year. (Remediation of failed courses may occur only while other courses are not in session in order to avoid further academic difficulty.) When deficiencies in coursework are major or in multiple courses, the promotions committee may recommend that the student repeat the entire course(s) the following year.

Grade Appeal Process

A student wishing to appeal an official grade or comment must present his/her appeal to the course director within two calendar weeks of the grade being posted. If requested as part of the appeals process, a student should have access to the actual checklists or comments that have been compiled as part of the grade, though identity of the evaluators submitting these data may be kept confidential. If a satisfactory resolution cannot be accomplished, the student may appeal the grade to the Grade Review Panel within two calendar weeks of the meeting with the course director by completing the “Request for Grade Review” form and submitting it to the Office of Curricular Affairs. The Grade Review Panel, designated by the Vice Dean will consist of one basic science faculty, one clinical science faculty, and one advisory dean other than the student’s advisory dean, and should be convened ad hoc within one month of receiving the notification of appeal. Both the student and the course director will be asked to present information regarding the appeal.

The Grade Review Panel will review the data related to the student’s performance in the course and the grading criteria for the course and will make a recommendation to the Vice Dean regarding preserving or changing the grade. At this time, the Vice Dean will either uphold the decision of the Grade Review Panel or make his/her independent decision relative to the documentation submitted.

If the student is not satisfied with the outcome of the grade appeal process, s/he may appeal to the dean of the School of Medicine within two weeks of receiving the decision of the Vice Dean. An appeal to the dean may be made only upon the grounds of improper procedures in the appeals process rather than continued disagreement about the outcome of the process. The dean will review the data related to the process of the appeal and determine whether the process was valid. If s/he finds the process valid, the decision is final and binding. At this time, the registrar’s office will be notified of the final grade and it will be reflected on the student’s permanent record. If the dean finds the process invalid, a new Grade Review Panel will be convened.

—Approved: Coordination and Guidance sub-committee, 5/10/2004

—Approved: Curriculum Committee, 6/2/2004

Grading Policy¹

Final course grades are available to the students via ACES. A grading basis is established for each course with Curriculum Committee approval. Currently there are two grading schemes established: Pass (P)/Fail (F) and Honors (H)/High Pass (HP)/Pass (P)/Fail (F). Certification by the course director that the student satisfactorily completed requirements for a course shall assign a grade.

The Liaison Committee on Education (LCME) requires that grades be submitted to the Office of the Registrar and made available to students within six weeks of the last day of classes. There is a shorter grade submission period for the last section prior to graduation.

An Incomplete (I) grade is reserved for those students who have not met all of the requirements of a course because of illness or other such extenuating circumstances, or because of the inability to attain sufficient understanding of course material without additional study. Incomplete grades that are not satisfied within one calendar year automatically become a grade of Fail (F). The course director notifies the registrar when an incomplete grade has been satisfied. A passing grade is then added, however a note of the Incomplete (I) remains on the official transcript. Grades of I are not removed from the permanent record and will appear on the official transcript.

A grade of withdrew (W) is available for those students who withdraw from a course due to a leave of absence or if a student withdraws from the School of Medicine.

A grade of F (fail) is recorded by the registrar on the official transcript and becomes part of the student's permanent record upon certification by the course director that unsatisfactory work has been done in the course based on documented criteria for passing. Failures cannot be erased from the official transcript, but the requirements of the course may be satisfied by repeating the course in a satisfactory manner. At that time, a passing grade is recorded on the official transcript.

Holiday Observance Policy

Students in the School of Medicine are to observe holidays as outlined on the School of Medicine academic calendar. Holidays that occur on a Saturday may officially be observed on the preceding Friday. Official School of Medicine holidays occurring on Sundays will be officially be observed on the following Monday. Second and Fourth year medical students who are completing clinical rotations and scheduled for the weekend or evening shifts (or call) prior to the scheduled and approved holiday, must complete their scheduled shift. For example, a holiday observed on the Monday after the actual holiday, a course director and/or department may schedule the student to be on the wards until the end of their shift.

Observed holidays (subject to change):

- Labor Day
- Thanksgiving Day (and the day after Thanksgiving)
- Christmas Day (and additional days as outlined on school academic calendar)
- New Year's Day
- Martin Luther King, Jr. Holiday
- Memorial Day
- Independence Day

Internship Interviews

It is the recommendation of the School of Medicine that a student miss no more than three days in any four week course/clerkship/elective. It is, however, at the discretion of the course instructor to determine the number of allowable days a student can miss for the purpose of interviewing. The student must give the instructor of the effected course sufficient notice of his or her intention to be away for an interview so that a mutual determination can be made as to the best time to be absent. This ensures that the learning experience in that course is in no way jeopardized. Students must confer with the instructor to complete missed time and work in a timely manner. Students must complete missed time within the same semester that they were enrolled in the course in which they are making up time.

1. Policy currently under review. Visit <https://medschool.duke.edu/education/student-services/office-registrar> for updates to the policy.

Leave of Absence

In order to be granted a leave of absence of greater than one month, a student is required to complete the “Status Change” form and submit it to his/her advisory dean. The initial leave of absence may be granted for personal or academic reasons for a period not to exceed one calendar year. The advisory dean presents the completed form to the registrar who will notify appropriate course directors, the Office of Financial Aid, the Office of Curricular Affairs, and the Vice Dean for Education. A student desiring an extension of the leave of absence beyond one calendar year *must* update the “status change” form and obtain permission of the advisory dean for the extension before the current leave has expired. Failure to do so will automatically result in administrative withdrawal from the School of Medicine.

For purposes of deferring repayment of student loans during a school-approved leave of absence, **federal regulations limit the leave to six months**, and other lenders may have varying requirements. It is imperative that a student confer with the Office of Financial Aid about the implications of a leave of absence for financial aid matters. Please refer to the bulletin for tuition reimbursement information.

To be eligible to return from a leave of absence a student must:

- have satisfied all financial obligations (debt) to the university and
- notify the advisory dean and the registrar at least thirty days prior to re-enrollment so that necessary paper work and registration may be accomplished, and relevant course directors informed. Failure to notify the school of the intent to return at the end of the approved period of LOA may result in administrative withdrawal from the School of Medicine.

In all cases of leave of absence, other than for approved double degree programs, a student must complete requirements for the MD degree **within six years** of matriculation. Enrollment after a leave of absence greater than two years, for whatever reason, will require that the student apply for readmission to the School of Medicine. Students who are readmitted after a leave of absence may be required by the Vice Dean of medical education to repeat some or all of the previously completed coursework.

Medical Leave of Absence

A medical leave of absence may be requested by a student or recommended by the advisory dean if it becomes apparent that a student is unable to continue the program of study for medical/psychiatric reasons. A medical leave is initially granted for up to thirty days. If additional medical leave time is required, the leave of absence policy must be followed and documentation from the treating physician must be submitted to the advisory dean. In order to return to the School of Medicine from a medical leave, all requirements for returning from LOA must be met and in addition, a statement from the student’s physician attesting to the student’s fitness to resume activities as a full-time student and recommendations for continued treatment must be submitted to the advisory dean. If there is an ongoing health issue requiring prescriptions, the advisory dean will request periodic verification of treatment from the student’s provider regarding compliance with treatment requirements.

Medical Licensure

The United States Medical License Examination (USMLE) is a three-step examination for medical licensure in the United States. USMLE is sponsored by the Federation of State Medical Boards (FSMB) and the National Board of Medical Examiners (NBME). It is governed through a jointly appointed composite committee consisting of representatives from the FSMB, the NBME, the Education Commission for Foreign Medical Graduates (ECFMG), and the public. Step One assesses how well a student can apply the knowledge and understanding of basic biomedical science, with an emphasis on principles and mechanisms of health, disease, and modes of therapy. There are two parts of Step Two. The first part, Step Two CK Clinical Knowledge (CK), assesses how well a student can apply their medical knowledge and understanding of clinical science considered essential for the provision of patient care under supervision, including emphasis on health promotion and disease prevention. The other part, called Step Two CS Clinical Skills (CS), assesses clinical performance of candidates through encounters with a number of standardized patients. Candidates take a medical history and for some patients conduct a physical examination. There is also a clinical note that is written after seeing the patient. Steps One, Two CK and Two CS must be passed to be eligible for Step Three. Step Three, typically taken in the first year of postgraduate training, assesses how well a resident can apply the medical knowledge and understanding of biomedical and clinical science considered essential for the unsupervised practice of medicine, with emphasis on patient management in ambulatory settings. Steps One, Two CK and Three are computer-based and must be taken in certified Prometric testing centers. Centers closest to

Durham are in Raleigh and Greensboro. Step Two CS is taken at one of five specially designed testing centers around the country. More information can be obtained from the USMLE website at <http://www.usmle.org>.

Duke University medical students are required to take Steps One, Two CK and Two CS prior to graduation. Duke School of Medicine considers licensure to be the responsibility of the individual, so passing is not a requirement for progress through the curriculum. However, students must sit for the exam prior to graduation in order to complete graduation requirements and receive their diplomas. The Duke curriculum is not directed to prepare students specifically for licensure examinations; however, satisfactory performance in medical school should provide sufficient information and experience to pass these exams.

According to the NBME, "In order to be eligible to register for USMLE Step 3, students and graduates of LCME- or AOA-accredited medical schools will be required to not only meet current examination requirements (i.e., passing Step 1 and passing Step 2 CK) but also to pass Step 2 CS if they: a) have graduation dates in 2005 or later, or b) have graduation dates prior to 2005 and have not passed the CK component of Step 2 taken on or before June 30, 2005." More information is available at the USMLE website. Applications for Steps One and Two are available on the National Board of Medical Examiners website (<http://www.nbme.org>).

Missing Grades

All grades must be supplied to the registrar's office prior to a student receiving their degree. Every effort will be made by the registrar's office to collect these grades. However, if within one month of graduation this does not occur, students will be requested to obtain the missing grades for their permanent records. Diplomas may be withheld until such time as all grades are submitted for the student.

MSPE Authorship and Content

Every 4th year medical student, whether applying for residency or not, will receive a Medical Student Performance Evaluation, an official school document that becomes a part of the permanent file. The MSPE is composed based on information the student has supplied about his/her activities and accomplishments, the official transcript and checklist or narrative evaluations in the official record, and knowledge that the letter-writer has about the student's qualifications. MSPEs from Duke do not provide any ranking information or any information from Pass/Fail courses that could be used to rank students.

Typically, the MSPE is composed by the student's advisory dean. If a student believes that his/her own advisory dean can not be objective in writing the MSPE, the student can submit to the Vice Dean for Education a request to opt-out of the usual method for assigning authorship of the MSPE. The Vice Dean will then assign that student's MSPE to another advisory dean on a rotating basis, or, if the student prefers that no advisory dean author his/her letter, to the director of assessment in the Office of Curricular Affairs. This request should be made prior to the writing of the MSPE by the student's advisory dean and not in response to the content once written.

The student is allowed to read the completed MSPE and to negotiate with the letter-writer over factual content or errors. If a student wishes to further appeal or challenge information that appears in the MSPE, s/he may do so by notifying the Vice Dean, who will either make a decision about the content in question or convene a panel of two faculty members and the director of assessment to arbitrate a final decision. After graduation from the School of Medicine, copies of the MSPE may be obtained from the registrar's office.

Policy for Completion of Coursework in First Year During the Term of the Course

The nature of the first year curriculum is rapid-paced and cumulative, such that each course is considered prerequisite for the successive courses. Efforts are made by course instructors, the Assistant Dean for Basic Science, and advisory deans to proactively identify students, who are having academic difficulty or who, for reasons of illness or other extenuating circumstances, are temporarily unable to attend class. In these situations, the assistance of student tutors, special guidance by course directors, or other forms of academic or counseling support may be offered to help the student accomplish course goals. In extenuating circumstances and at the discretion of the course director(s), the student may negotiate to delay due dates, tests or presentations, or to retest or revise coursework. (See policy on retesting examinations).

Promotion

The Promotions Committee will periodically review the academic performance of all medical students on a quarterly basis. The committee members and the chair will be appointed by the Vice Dean for Medical Education. The advisory deans will serve as ex-officio capacity. Serving on the Promotions Committee will be a four year commitment.

The Promotions Committee will recommend to the Vice Dean for Medical Education:

- Promote students whose work is satisfactory.
- Warn students whose work is less than satisfactory that they must improve their scholastic endeavor and require such students to remediate, retake, or review specific courses, or undertake other actions that may assist in the correction of deficiencies.
- Place on probation or suspension students whose work is unsatisfactory or who have demonstrated unprofessional behavior
- Or request the resignation of any student who is considered an unpromising candidate for the degree of doctor of medicine
- Recommend dismissal

The student wishing to appeal a decision may do so to the Vice Dean for Education within two weeks of notification.

The Vice Dean, in consultation with the dean of the School of Medicine, reserves the right to require the withdrawal of any student at any time if, in his/her opinion, the student should not continue in the School of Medicine.

Reciprocal Agreements With Neighboring Medical Schools

Under a plan of cooperation between the Duke University School of Medicine, the Wake Forest School of Medicine, East Carolina University's Brody School of Medicine, and The University of North Carolina at Chapel Hill School of Medicine, degree candidates of one institution may participate in elective courses for credit at one of the other schools. Courses taken usually are ones not available at the home institution or not offered at times that can be accommodated by the students' schedules. Enrollment in another institution is limited to one term and is contingent upon available space in the course(s). These courses are regarded as "in house" electives at Duke and, as such, appear on the transcript with the awarded grades. Students involved in this program are assessed the current Duke tuition and fees. Interinstitutional visitors to Duke are charged neither tuition nor student health fees for this type of enrollment.

Important Note: The amount of credit granted for an interinstitutional course is the same as that awarded for a comparable course at Duke unless the course concerned is (1) a sub-internship, or (2) offered for fewer credits and meets less often than its Duke counterpart. Students can earn a maximum of four course credits for sub-internships taken at any school other than Duke or The University of North Carolina at Chapel Hill.

Readmission after Withdrawal

Students who wish to re-enter the medical program after withdrawing from the School of Medicine must provide the following to the associate dean for student affairs:

- A statement detailing
 - the reason(s) for withdrawing from the program, including relevant history leading up to the decision;
 - how the issues relating to those reasons have been addressed;
 - a discussion as to why the student is reapplying to the medical school, including information concerning changes in situation, reasons for wishing to pursue a career in medicine, and an explanation as to the chosen time for return; and
 - a chronological list and brief description of actions since withdrawing from the medical school;
- an updated curriculum vitae;
- a transcript of any academic courses taken since the withdrawal; and two letters of reference from people with whom the student worked during the withdrawal period.

In the event of a withdrawal because of medical reasons, the School of Medicine requires an evaluation from Student Health Services to assess readiness for returning to the School of Medicine.

The applicant is scheduled for two interviews with either administrative staff or faculty in the medical school. After these meetings take place, a committee composed of the Vice Dean and the advisory deans convenes to review the information submitted relevant to the reapplication. The decision of the committee, which is final and non-negotiable, is provided in writing to the applicant and to the school administrative offices.

Registration

Students are expected to register at specified times for each successive term. All students register on-line via ACES. First-year students register for the required first-year classes; second-year students register for their two selectives, the Clinical Skills course, Clinical Assessment, Practice Year 2, and the required clinical core online; third-year students register for their study programs, and other required third-year courses (as well as electives); fourth-year students register for their elective and capstone courses online. Students who are approved to complete an away rotation should refer to the study away section in the bulletin. Prior to registration, students are sent registration instructions via e-mail. Students must contact their advisory deans prior to the scheduled registration period and the advisory dean must flag their advisees as eligible to enroll prior to an online registration period. Students completing their scholarly experience (third year of medical school) are currently required to complete the third-year registration form. Students must obtain signature approval of their advisory dean, the third-year study program director, and their approved mentor. Upon receipt of the signature approvals on the registration form, the students submit the completed form to the third year coordinator. A copy of the approved form is provided to the School of Medicine Office of the Registrar.

There are designated online Drop/Add periods for each term for the fourth-year courses. Drop/Add dates and instructions are e-mailed to the students in advance of the scheduled Drop/Add dates. Drop/Add requests made outside of the Drop/Add periods must be done by completion of the Drop/Add form. Signatures of the impacted course directors and the student's advisory dean are required.

Students who fail to register during the specified enrollment periods are subject to a \$250 late registration fee. Students who have not paid any fees owed to or fines imposed by the university or School of Medicine (such as laboratory fees, library fees, and parking fines) by the date specified for registration for the following term will not be allowed to register for the following term until such fees and fines have been paid in full. The registrar's office cannot remove a registration hold placed by the bursar's or loan offices, therefore, students should contact the bursar's or loan office to resolve any payment issues or registration/transcript holds placed by the bursar or loan offices. Students may only take courses for the number of credits as approved by the Curriculum Committee

Repetition of Courses

Students enrolled in the doctor of medicine program may not take the same course for credit more than once.

Retesting Policy¹

Individual Examinations

In order to be eligible to retake a test of a failed examination in a School of Medicine course that allows for retesting on individual examinations during the course, the student must complete the Request for Re-examination form and submit it to his/her advisory dean. The opportunity to retake the examination is contingent upon the student completing the agreed upon steps directed by the course director and advisory dean which may include utilizing academic resources(s) to prepare for the retake, reducing co-curricular activities, seeking medical/mental health services, and/or taking a leave of absence.

The student is eligible for only one retake of a failed exam. For first year students, the retake must occur prior to a student starting second year clerkships. For students in clinical clerkships or electives, the retake must be taken within a year of the original exam. A grade of "Incomplete" ("I") is reported while a retake is pending. Any student permitted a retest in a course due to failure is not eligible for honors. If a student fails the reexamination and thereby fails the course, the student will receive a "Fail" grade on the transcript.

This policy is applicable only to students who fail an exam and cannot be utilized for students who want to improve a passing grade. Students who miss an exam and whose absence has been deemed excused by the course director will have the opportunity to take a make-up exam (see Excused Absences, Unexcused Absences, and Testing policies in the School of Medicine Bulletin).

1. Policy currently under review. Visit <https://medschool.duke.edu/education/student-services/office-registrar> for updates to the policy.

Course

A student who has a failing score at the conclusion of a School of Medicine course that has a course policy allowing for reassessment by retest may request a retest in writing using the Request for Re-examination form and submit it to his/her advisory dean. The opportunity to retake the examination (or the course) is contingent upon the student taking the remedial steps directed by the course director and advisory dean which may include utilizing academic resource(s) to prepare for the retake, reducing the co-curricular activities, seeking medical/mental health services, and/or taking a leave of absence.

Satisfactory Academic Progress

Satisfactory academic progress for students in the School of Medicine is defined as the successful completion of all requirements necessary for the advancement from one year to the next. These requirements are as follows:

First to Second Year. Requires satisfactory completion of 46 course credits in the approved basic science curriculum in one calendar year.

Second to Third Year. Requires satisfactory completion of 56 course credits in the approved clinical science curriculum within fourteen months.

Third to Fourth Year. Requires satisfactory completion of 36 course credits in basic science within ten months (twelve months for master's or scholarship students).

Fourth Year to Graduation. Requires satisfactory completion of 28 course credits in clinical science within one calendar year.

In unusual circumstances (including illness, remediation, or irregular sequence of courses) the determination of satisfactory progress for academic purposes is made by the Vice Dean.

Satisfactory Academic Progress Policy for Financial Aid

New Federal regulations that went into effect July 1, 2011, require that Duke establish and implement a policy to measure whether students applying for and/or receiving financial aid are making satisfactory academic progress (SAP) toward a degree. This regulation applies to all students applying for aid, whether or not financial aid has been previously received. Satisfactory Academic Progress (SAP) is the successful completion of degree requirements according to established increments that lead to awarding the degree within published time limits. There are three measurements that are used to determine eligibility: credit hour requirement, grade point average, and maximum time frame. Not meeting these requirements may result in loss of all financial aid. Below is an explanation of these requirements.

Monitoring of Academic Progress

Students' progress will be reviewed after grades are finalized, with the exception of medicine which will be at the end of each year. A determination of eligibility to receive financial aid for subsequent enrollment periods will be made at this time. Although Duke will send a notification to the student, the student is fully responsible for monitoring their own academic progress as it relates to financial aid eligibility. The student should review their grades on an on-going basis and compare it to the standards set forth in this SAP policy to determine if they are meeting (or failing to meet) the established criteria. Evaluations will be done in a timely manner; however the next term, (or year for medicine), may be in progress at the time we are able to notify students of their ineligibility. Should the student be concerned that they may not have met the requirements, they may contact the financial aid office during normal business hours. Students will be notified via their Duke e-mail account if they have failed the measurement. Students may appeal the decision. The appeal form and directions will be located on our website. There are three parts to the measurement and they are explained below:

- **Maximum Time Frame for Eligibility:** reviewed each term/year. The normal time frame for completion of required coursework is determined by each program. Each program determines progress to be reasonable by dividing the cumulative number of credits the student has successfully completed by the cumulative number of credits the student has attempted. Students are allowed to take one and a half times the years of the program to complete the degree. Leave of Absences (LOA) are not counted unless the time frame from the date of matriculation reaches ten years. Students are not allowed to take more than ten years, including LOAs, to complete degree requirements.

- **Quantitative:** reviewed at the end of each term/year. Students must successfully complete a minimum of 70 percent of the total number of hours for which they are enrolled after the first week of the enrollment period and cumulatively.
- **Qualitative Requirement:** reviewed at the end of each term/year. Successful completion of a course for all students, for purposes of SAP calculations, means a student must earn the equivalent of 70 percent or better. All other grades, including F (fail), I (incomplete), or W (withdrawal) will not be counted as successful completion. Only an incomplete that has been changed to a passing grade (70 percent or better) can be added to the number of hours completed for the semester of the original registration. It is the students' responsibility to notify the Office of Financial Aid once an incomplete grade has been changed to a valid grade.

SAP Probation and Appeal Process

Students who lose eligibility for financial aid may appeal the decision by following the procedures outlined below. Those wishing to utilize this process must indicate mitigating circumstances that occurred during the course of the semester in question, that could not have been anticipated prior to that period, and that adversely affected their ability to successfully complete their required coursework. (Events such as the death of an immediate family member, extended illness suffered by the student, or other unforeseeable events that may have caused significant hardship for the student may be considered as examples of mitigating circumstances.) To appeal, a student must

- submit a letter of appeal to the financial aid office. The appeal letter should include the following:
 - mitigating circumstances that prevented the student from meeting the requirements of academic progress (e.g. death in the family, student illness or injury, other personal circumstances). Mitigating circumstances do not include withdrawing from classes to avoid failing grades, pursuing a second major or degree, etc.;
 - documentation that supports the student's basis for the appeal;
 - steps the student has taken/will take to ensure future academic success. This plan should outline the student's academic goals for each period (e.g. number of credit hours and/or cumulative GPA) that will enable the student to meet the requirements of academic progress at a specified future point in time; and
 - anticipated graduation date
- In most cases, the SAP Appeals Committee will render a decision within two weeks of receipt of a fully completed appeal. All decisions of the SAP Appeals Committee are final. Notification of the decision will be sent via the students Duke e-mail account.
- The promotions committee will monitor and review progress of the student. Failure to meet SAP during the probationary period may result in dismissal from the program.
- If the SAP appeal is approved, financial aid will be awarded for the next semester on a probation period as long as an approved academic plan is in place. An academic plan must be formulated with a student's advisor.
- If the SAP appeal is denied, financial aid will be canceled. If you have been denied aid please review the section "Regaining Financial Aid Eligibility" below. Term and academic plans and/or other conditions of appeal approval will be included in the notification letter.

Upon receipt of all completed appeal materials, the student will be considered for a probationary semester of financial aid in order to reestablish satisfactory academic progress. Students whose appeal is approved will be placed on financial aid probation. Academic progress will be evaluated at the conclusion of each enrolled term for students on academic probation.

Students who fail to meet the requirements for academic progress for their probationary semester or do not complete the requirements of their academic plan will again be ineligible for financial aid and subject to the appeal process.

Students who meet the requirements for academic progress for their probationary semester will resume good standing and again be evaluated at the conclusion of the following term/year.

Regaining Financial Aid Eligibility

Students denied financial aid after completing the appeal process or failing to meet their academic plan can regain full eligibility for financial aid by:\

- successfully completing coursework that will meet or exceed the minimum required for their total attempted hours or
- raise their coursework attempted to the 70 percent level as required by their program.

Students who have reached their maximum time frame are not able to regain eligibility.

Students who are ineligible to receive financial aid may use one or more of the following payment options while attempting to regain eligibility: student's own resources, Duke Tuition Management Payment Plan, and/or alternative/private educational loans. Students who have taken the necessary measures to regain eligibility for financial aid must contact the Office of Financial Aid immediately upon doing so and apply for Reinstatement of Eligibility. Students' academic performance will then be reviewed, and if all required SAP criteria is met, full financial aid eligibility will be reinstated, effective the following semester.

This policy has been vetted and approved by the School of Medicine educational programs, advisory deans, promotions committee, and the Curriculum Advisory Group.

Study Away Policy

Students in the MD program at Duke who have maintained a high level of academic performance throughout their first two to three years are eligible to study at another institution and receive academic credit at Duke for this experience. Students must have successfully completed all courses in the first two years at Duke before they are eligible to study away for credit. It is unlikely that students with any failures or marginal performances at Duke will receive permission. It is not recommended and is strongly discouraged for a student to study away from Duke for credit during the four weeks prior to his or her graduation. Study away applications are available either in the registrar's office or online at <http://registrar.mc.duke.edu>. The applications for third-year study away are forwarded to the third-year committee, which is notified by the promotions board if any second-year students are ineligible, and to the Duke risk management office for approval. All Study Away for credit (including military rotations) must be approved in advance by these three entities. Third-year students who study away are liable to pay Duke's tuition as well as any tuition at the visited school. Fourth-year study away must be approved by the student's advisory dean and the Duke risk management office. Credit toward the Duke MD degree is not to exceed nine course credits of clinical elective credit unless recommended by the committee (exceptions, military students). Students are responsible for any tuition and/or fees associated with the study away rotation.

To obtain approval for work taken away from Duke University, the student must first contact his or her advisory dean to determine if qualified. Transfer students and students receiving grades of F (fail) in any of the core basic or clinical science courses of the first and second years even after successful remediation are not eligible for this option. Application forms, as well as additional information, may be secured from the medical school registrar's office for study away during the fourth year. Students who apply for an away rotation and obtain approval through the Visiting Student Application Service (VSAS) must also complete the Study Away Application for the School of Medicine. Copies of the elective books of selected medical schools are kept in the Reserve Room at the Medical Center Library and are available for student usage.

Upon approval and receipt of the study away application, students are registered for the study away rotation by the School of Medicine registrar's office. Clinical science courses are designated as Study Away 410C, 411C (UNC), 421C (WFU), and 431C (ECU). The amount of credit awarded for study away work is based upon that given for a comparable course at Duke. With the exception of those at UNC-Chapel Hill, subinternships taken extramurally can earn a maximum of four credits at Duke. The current Duke tuition, rather than that of the visited institution, is assessed for extramural clinical science courses.

Fourth-year students may only study away as visiting students at other institutions for one or two elective periods, or a total of 8 course credits.

Testing

Students are expected to take tests, quizzes, examinations, and standardized patient exams, and to turn in assignments at the scheduled time unless they have obtained an excused absence from the course director or are incapacitated to the point of inability to make this contact. Delaying an examination for academic gain (i.e. to improve performance) is a violation of the Code of Professional Conduct. A student missing an examination without an excused absence will receive a "0" score and will not be eligible for a make-up exam. If the student has an excused absence from an examination, the student should negotiate a date to take the exam with the course director. It is expected that these make-up exams should occur within the time frame of the course, or prior to the subsequent promotions committee meeting if it is a final exam in the first year, or within twelve weeks of the clerkship ending in a second-year course.

Time Away Requests for Second-Year Courses

Medical students should consider their clinical year with an approach that reflects professional behavior and acknowledgement of the accountability and dedication required by physicians and patient care teams.

Balancing the necessary dedication to professional responsibilities as a member of a health care team with the need for self-care and planning for personal and professional obligations is a critical component of the learning process during the clerkship year. This behavior applies to patient care and academic activities.

Illness

- Notification of illness: If the student is not able to attend to their duties due to illness it is the student's responsibility to notify the appropriate course personnel as soon as possible.
- Notification must be provided in a timely fashion to allow the clinical team to adjust to the absence of a team member.
- Recurring appointments: Students with recurring appointments should use the request for time away protocol. It is not necessary to reveal the specific medical reason for the request.

Tardiness

- Arrive **on time** for all clinical and academic sessions.
- Notify the appropriate course personnel if there is a problem that will result in tardy arrival.

Requests for Time Away

We recognize that professional and personal obligations may arise for which students would appreciate time away from the service. Any absence must be approved by the course director. The policies and consequences of missed time vary from course to course. There may be minimum attendance requirements to successfully complete the course as determined by individual course policy.

It is the student's responsibility to request time away **well in advance** of the clerkship to allow for optimal scheduling. The course director will be responsible for all decisions regarding approval or denial of the time away request. The course director will determine the necessity of make-up work for any requested absence.

Protocol for time away requests:

- Requests for proposed time away must be submitted to the course director at least eight weeks, if possible, prior to the scheduled clinical or academic event.
- Last-minute requests will not be granted in nonemergent situations.
- Absence from required orientation activities cannot be "made-up," therefore, check your calendar well in advance and avoid scheduling activities during the orientation and preclerkship activities.
- Request forms are available at The School of Medicine registrar's website, registrar.mc.duke.edu and BlueDocs
- If time away is required that exceeds minimal attendance guidelines for the course, the student must discuss with the course director and their advisory dean options for making up missed time, dropping the course or taking a leave of absence.

Visiting Students

The School of Medicine provides opportunities for visiting medical students enrolled at medical schools with whom an approved affiliation agreement is on file, to participate in clinical elective courses for a maximum period of eight weeks. Approved visiting students are permitted to enroll in courses only after the registration period for the applicable semester has concluded for Duke medical students, and are required to adhere to the Duke academic calendar. The School of Medicine does not offer long term or extensive clinical experience sufficient to satisfy the clinical educational requirements of other medical schools. If approved and scheduled for an elective(s), applicable registration fees for students from an LCME approved medical school, a COCA approved Osteopathic medical school or international medical schools is required. Payment should be made according to the online bill provided by the Bursar. Registration fees will be refunded in full if the elective is cancelled prior to the approved start date. Notice of elective cancellation should be provided via e-mail to the visiting student coordinator. If the student withdraws on or after the first day of the approved elective period, no refund will be provided.

Participation Requirements: Information for all visiting medical student applicants who are approved and scheduled for electives: All applicants who are approved and scheduled for an elective(s) will be required to have all participation requirements completed no later than 15 days prior to the approved elective start date via Certified Background.

- Criminal Background Check
- 11 Panel Drug Screen
- Duke University Mandatory Immunization Requirements (via Medical Document Manager)
- Current Influenza Immunization (via Medical Document Manager)
- Current BLS (Basic Life Support) Certification (via Medical Document Manager)
- Proof of Health Insurance Coverage (via Medical Document Manager)

These requirements will also be referenced in the acceptance letter and e-mail provided to approved and scheduled students along with Duke specific information on how to establish your profile with CertifiedBackground. All costs for these required services via Certified Background are the responsibility of the approved visiting student. These requirements for participation may only be fulfilled/completed via CertifiedBackground.

Mandatory: Student Health Fee and Student Medical Insurance Program information for visiting international medical students.

As of December 15, 2013, all approved and scheduled visiting international medical students participating with an F1, J1, B1/B2 or WB visa will be assessed the mandatory Student Health Fee (SHF) at the prevailing rate for the semester of enrollment. Please note the fee will be assessed for each 4 week period of enrollment based on the start/end date of the approved elective period. Should these dates not fall on the first and/or last day of the month, the assessed SHF will be for a minimum of 2 months for each 4 week elective.

In addition, all approved and scheduled visiting international medical participating with an F1, J1, B1/B2 or WB visa, participation in the Student Medical Insurance Program is mandatory. The student will be assessed the Student Medical Insurance Program premium (SMIP) at the prevailing rate as set by the insurance provider. Please note the fee will be assessed for each 4 week period of enrollment based on the start/end date of the approved elective period. Should these dates not fall on the first and/or last day of the month, the assessed SMIP premium will be for a minimum of 2 months for each 4 week elective. Fees for SMIP and the Student Health Fee will be posted to your student account via ACES. You may find additional information regarding the topics online: <http://studentaffairs.duke.edu/studenthealth/international-students-scholars>.

Should these required fees not be paid in full as noted, the student may be withdrawn from the program and forfeit any and all fees paid up to that time. For information, e-mail the visiting student coordinator at steven.wilson@duke.edu or write Duke University School of Medicine, Office of the Registrar, Visiting Student Coordinator, Box 3878, Durham, NC, 27710. Detailed information about the visiting student program is available online at <https://medschool.duke.edu/education/student-services/office-registrar/visiting-students>.

Withdrawal Policy

If a student withdraws from a program before the end of the first week of classes, including involuntary withdrawal/dismissal for academic or professionalism reasons, all tuition is refunded. A student who withdraws from the program later in the term will have no tuition refunded and the status of the student is indicated on the permanent record with a W (Withdrawn).

Voluntary withdrawal from a program is initiated at the request of the student. Discussion with the student's advisory dean is required. Such requests must be submitted in writing using the "Change" form located on the School of Medicine registrar website. The completed form, with all required signatures, should be submitted to the Office of the Registrar. The registrar will notify course faculty as appropriate, the financial aid office, Office of Curriculum, and Duke bursar's office. It is the student's responsibility to contact the bursar's office regarding fulfillment of financial obligations to the university. It is also the student's responsibility to meet with a financial aid office representative to discuss adjustments to aid and federal exit requirements.

The Promotions Committee is responsible for recommending to the Vice Dean of medical education if a student should be involuntarily withdrawn/dismissed for academic or professionalism reasons. The student will be notified in writing with copy to the School of Medicine registrar. A student wishing to appeal a decision may do so to the Vice Dean of medical education within two weeks of the notification. If there is a reversal in the decision, the Vice Dean will notify the registrar. The registrar will notify course faculty and as appropriate, the financial aid office, Office of Curriculum, Duke bursar's office, and advisory dean.

Policies for All School of Medicine Programs

Academic Freedom

Freedom of inquiry and the free exchange of ideas are essential for the fulfillment of the university's mission. Academic freedom is a right and responsibility of students as well as faculty.

Students who believe that their academic freedom has been abridged should submit a written complaint to the Vice Dean of Education. The Dean may enlist the faculty in establishing the merits or extent of the complaint by appointing a disinterested two-person subcommittee of the Clinical Sciences Faculty Council on Academic Affairs to provide advice. Cases not resolved by the Vice Dean may be brought to the attention of the provost. Students may also seek advice of the student ombudsperson in resolving a complaint.

Academic Standards

The faculty of the Duke University School of Medicine has the responsibility to define minimum acceptable standards for academic performance. In all courses, minimum passing standards are defined by the course director in collaboration with her or his department chairperson and faculty. These standards are communicated to the students at the beginning of each course. In clinical departments, acceptable professional standards of behavior and attitudes are included in performance evaluation.

Faculty have the responsibility of notifying students who are not meeting minimal standards for passing a course early enough for the student to be able to work toward achieving the minimal standard by the end of the course. In most cases, this is at the midterm of a course. Tutorial help or guidance in correcting deficiencies should be offered to any student so notified.

In addition to performance directly related to course requirements, all students must maintain a high standard of professional behavior. Examples include how a student communicates with course faculty and support staff, their manifestations of responsibility to the school, fellow students, and patients, as well as behavior off-campus that would be deemed unprofessional for students becoming medical professionals. Incidents reported to the Vice Dean's office are investigated. The number of such reports, the severity of the transgression, and other aspects specific to the behavior in question can result in disciplinary action, including dismissal from medical school.

Code of Professional Conduct of the School of Medicine

Preamble

The Duke University School of Medicine strives to educate health professional students who have a high capacity for ethical professional behavior. Since training in professional behavior is a part of training in the health professions enrolled students commit themselves to comply with all regulations regarding conduct established by Duke University (the Community Standard and the Bulletin of Information and Regulations of Duke University), the School of Medicine and the individual's own academic program, as well as the Social Media Policy of the Duke University Health System ([link](#)). Professionalism is an academic issue and failure to demonstrate prescribed professional standards may jeopardize advancement and graduation in the same way as other academic matters. These standards closely follow those established and expected for the medical profession for which the student is training and are intended to serve as a precursor to future professional expectations.

Statement of the Code of Professional Conduct

The Code of Professional Conduct is intended to promote:

- Intellectual integrity and honesty in all endeavors
- Concern for the welfare of others and respect for the rights of others
- Professional demeanor and behavior

Students will be expected to hold themselves to these standards:

The student will not:

- Cheat
- Lie
- Alter or falsify academic, research or patient documents (both paper and electronic)
- Commit plagiarism or submit for course work that of another individual, unless it is expressly as part of an accepted group learning exercise as defined by the Instructor

- Participate in academic activities, including patient care, having used non-prescribed psychotropic substances (including alcohol) or having inappropriately used prescribed substances.
- Engage in romantic, sexual, or other nonprofessional relationships with a patient or a patient's family member, even upon the apparent request of a patient or patient's family member
- Engage in disruptive behavior in the classroom, clinic, hospital, or laboratory that might interfere with the learning, work or clinical care of others.
- Gain or provide unauthorized access to academic or administrative files, patient medical records, or research documents, via computer or any other means or method
- Misrepresent him or herself as a licensed or certified health care provider

The student will:

- Offer original work for each assignment or learning task
- Admit errors to his/her supervisor and not knowingly mislead others in the classroom, clinical setting or laboratory
- Respond promptly to official communications from the school, comply with attendance standards for learning activities (including assigned call duties), and meet all School of Medicine mandatory deadlines
- Engage in the responsible and ethical conduct of research
- Treat patients or research subjects, their family members, and his/her colleagues with respect and dignity both in their presence and in discussions with others, and maintain appropriate privacy and confidentiality of patient communications and records.
- Recognize the limitations of his/her knowledge, skills, or physical or emotional state, and seek supervision, advice, or appropriate help before acting.
- Learn to recognize when his/her ability to function effectively is compromised, ask for relief or help, and notify the responsible person if something interferes with the ability to perform clinical or research tasks safely and effectively.
- Deal with colleagues in a considerate manner and with a spirit of cooperation, and avoid offensive language, gestures, or remarks while interacting with all persons encountered in a professional capacity regardless of race, color, ethnicity, religion, national origin, age, sex, gender identity, sexual orientation, disability or socio-economic status
- Take personal action to support equity and inclusivity in the learning environment
- Maintain a neat and clean appearance, and dress in attire that is appropriately professional and safe for the patient population served or the learning activity (and when in doubt, ask his/her instructor for guidance).
- Report promptly any witnessed violations of the Code of Professional conduct to a school official or via the website: https://duke.qualtrics.com/SE/?SID=SV_0xINCG6gxBow5Rr

Scope of the Code of Professional Conduct

The Code of Professional Conduct is designed to promote the professional development of students in the School of Medicine. It should be understood that these guidelines represent standards to strive for. It should also be recognized that this code cannot anticipate every potential offense and that unprofessional behavior not specifically mentioned in this code can still be subject to academic sanctions. Specific incidents will be considered in the context in which they occur. In addition, the magnitude and chronicity of infractions will be taken into account. Finally, it is important for students to understand and accept that professional behavior in the classroom, laboratory, and clinical setting is considered to be as significant an element of academic performance as subject-related evaluations such as Molecules and Cells examinations or clinical performance in Internal Medicine.

The Code of Professional Conduct is intended to guide the professional behavior of students studying in the health professions programs and applies to all endeavors and conduct pertaining to those studies. It is not intended to guide behavior that is a part of a student's private life away from his or her studies in a direct way, but students should be aware that society has high standards for the conduct of medical professionals, and such behavior may come to the attention of the school in several ways and become the focus of a Code of Professional Conduct investigation.

The Code of Professional Conduct applies to a student while enrolled, and also after graduation in matters pertaining to certifying credentials, issuing transcripts, and verifying degrees that have been granted by the School of Medicine

Civil and Criminal Charges/Offenses

Academic sanctions may be imposed on individuals who are

- **being charged with an offense in the civil justice system.** The school will generally not pursue an investigation until the outcome of the civil court proceeding is known, unless the alleged offense is such that

allowing the student to continue his or her studies could be detrimental *to the safety of patients or other members of the school*, as determined by the Vice Dean for Education.

- **being charged with a criminal offense.** The student is obligated to report this to the Vice Dean for Education immediately. If a matriculating student has been charged with a criminal offense between the time he/she wrote an application and the time he/she arrives at school, he/she should inform the Vice Dean before arrival. If the school later discovers that a student has withheld disclosure of a criminal charge, he/she may be subject to immediate dismissal by the Vice Dean. *In all situations, the student may not be allowed to continue the course of study until cleared of a criminal charge, as determined by the Vice Dean for Education.* This does not reflect a “guilty until proven innocent” standard, but rather, the obligation of the school to ensure the safety of patients and other members of the school.

Academic Sanctions and Appeals in the School of Medicine

Academic Performance Principles

All students enrolled in educational programs in the School of Medicine are expected to achieve a specified level of academic performance and abide by the Standards of Professional Conduct which describes the personal and professional behavior expected of students training in the health sciences.

Professionalism is an integral part of each academic program’s performance standards and is incorporated into the student’s academic assessment.

Procedures dealing with unacceptable academic performance (including unprofessional behavior) are to be developed by each academic program. The initial determination of unacceptable academic behavior or unprofessional conduct is performed at the educational program level.

Unsatisfactory Academic Performance

Academic programs who wish to place students on academic probation, suspension or dismissal must notify the Vice Dean for Education and supply relevant material justifying the sanction.

The Vice Dean for Education is responsible for placing individuals on *academic probation, suspension or dismissal upon a finding of unsatisfactory academic performance.*

The Vice Dean may support or recommend an alternative sanction depending on the situation, information provided, and further investigation.

Student Appeals

A student may appeal to the Academic Appeals committee a decision of the Vice Dean for Education if the student feels that the process the program used in recommending the sanction was unfair or that the sanction levied by the Vice Dean was inappropriate based on the circumstances surrounding the situation.

Academic Sanctions Appeals Process

The Academic Appeals Committee (AAC)

Membership

- One faculty member from each educational program (MD, MS, PA, DPT, Path Assist., Op Tech).
- Each program will select one student and one alternate student from a different academic year to serve as representatives to the AAC. Students will serve as needed only for appeals of actions concerning fellow students enrolled in their own program (e.g., medical student representative for medical students, DPT student representative for DPT students, etc.). In the event that the student representative is in the same class as the appellant, the student alternate will serve.
- Faculty members will serve a 1 year term (renewable annually for a total of three terms) and appointments will be staggered such that new members will join experienced members. Students will serve a one year term.
- If a Committee member was involved in recommending the sanction that is being appealed, an alternate member from that program’s faculty is selected in their place.
- The Chair will be selected by the Vice Dean for Education.
- The Vice Dean will serve ex-officio to assist with process but will not participate in discussions or deliberations.

Procedures

- The student must submit their appeal in writing along with supporting documents to the Vice Dean for Education within 10 business days of being notified of an academic sanction. The written appeal should address each of the reasons that were provided for the sanction and state why the sanction is not appropriate in their situation. In essence the student should answer the question, “I should not be sanctioned because....” Any background information to support the student’s argument should be provided at that time.
- Pending the determination of the appeals committee, the student will be allowed to continue course work provided they are not felt to be a threat to themselves or others.
- A list of the committee members who will be participate on the committee will be forwarded to the student. The student has the option of challenging any member of the committee that is felt to be prejudiced against them because of personal interactions, previous assessments, or participation in prior academic sanction committees. These members will be replaced by faculty members who have no previous interactions with the student.
- The Vice Dean will create a summary report for the committee explaining the reason for the sanction and include supporting documents from the program and student.
- The Vice Dean will supply the student’s written appeal request, the summary report and any other pertinent documents to the committee for review.
- The committee will hold a meeting within a reasonable time to make a decision about the appealed sanction.
- At least 72 hours prior to the meeting, all material to be considered, other than the interviews themselves, will be distributed to the committee members and the student for their review.
- The student will be given an opportunity to explain in person to the committee their rationale as to why the sanction was not appropriate and should be reversed or modified.
- The educational program will be given the opportunity to present why they recommended that the student be sanctioned.
- The committee may ask for additional information and question other individuals as necessary to reach a decision about the appeal request.
- The Chair of the committee will inform the Vice Dean for Education of its recommendation in a timely manner after the committee meeting (typically within a week). The committee can uphold the Vice Dean’s sanction, recommend another sanction or recommend no sanction.
- The Vice Dean of Education will then notify the student and other interested parties of the committee’s decision.
- The student will have 10 business days after notification of the outcome of the appeal to submit a request to have the Dean of the School of Medicine review the appeals process. An appeal to the Dean may be made only upon the grounds of improper
- *procedures* in the process rather than continued disagreement about the outcome of the process. The Dean will review the information related to the process of the appeal and determine whether it was appropriate. The Dean can uphold the Committee’s decision, recommend another sanction, recommend no sanction, or send the matter back to the committee for further consideration.
- Once the Dean of the School of Medicine upholds a decision of dismissal, the student relinquishes student status and is no longer enrolled in the University.

Committee meeting procedures

- At least 72 hours prior to the committee meeting the members and student will have access to:
 - The Vice Dean Letter to the student indicating the sanction and it’s reason
 - The written appeal request by the student indicating why the sanction is not appropriate
 - Supporting documents from the program as to why they requested the student be sanctioned. This includes such things as exam scores, learning contracts, performance reviews, academic counseling attempts, remediation efforts, police reports etc.
 - Supporting documents from the student as to why the sanction should not be enforced.
 - The names of all faculty, students, or staff that will attend the meeting
- The student has the right to be present at the appeals committee for the portion of the meeting that involves the education program’s presentation of the rationale for the recommended sanction and questions by the committee to the program’s representatives. The student is not permitted to be present for the deliberations of the committee.
- The committee meeting will begin with a review of the sanction and the provided materials.

- The education program that has sanctioned the student will present the reasons for the recommendation and answer any questions that the committee may have. Depending on the issue, additional faculty or other students who are involved may be asked to attend and provide information to the committee.
- The student will then present to the committee why they feel the sanction is inappropriate or should be reconsidered and answer any questions the committee may have. The student may request that the committee also hear information from other faculty or students with knowledge about the circumstances surrounding the reasons for the sanction. These individuals should be able to provide specific clarifying or defining information and not act as “character witnesses”.
- Before making its recommendation the committee may request to meet with other faculty or students that may be able to provide additional information or insight into the circumstances related to the recommended sanction.
- The committee will discuss the issues and reach a recommendation by a majority vote as to whether the sanction should be upheld, changed to a lesser sanction or removed.
- The chair will draft a summary of the meeting and the committee’s recommendation and circulate to the committee members for approval.
- Once approved, the recommendation will be communicated to the Vice Dean for Education who will notify the education program and the student.

Commencement

Graduation exercises are held once a year in May when degrees are conferred on, and diplomas are issued to, those who have completed requirements by the end of the spring semester. Those who complete degree requirements at the end of the summer or fall terms receive diplomas dated September 1 or December 30, respectively. There is a delay of about one month in the mailing of September and December diplomas because diplomas cannot be issued until they are approved by the Academic Council and the Board of Trustees.

Education Records/FERPA

In accordance with the Family Education Rights and Privacy Act (FERPA), students are granted certain rights with respect to their education records. They are:

- The right to inspect her or his education records.
 - Education records include those records which contain information directly related to a student and are maintained as official working files by the university. They do not include records made by faculty and administrators for their own use and not shown to others; campus police records; employment records; records of physicians, psychologists, etc., made or used only for treatment purposes; and records containing information relating to a person's activities after she or he graduates or withdraws from the university.
 - Although FERPA regulations do not require institutions to provide copies of the education records, unless to do so would effectively prohibit an individual from viewing her or his records, it is the policy of Duke University Medical School to make such copies available. However, the medical school may deny requests to release copies of the transcripts of those students in financial default. The medical school also does not release copies of other schools’ transcripts unless mandated by FERPA.
- The right to amend the contents of the education record to ensure that they are not inaccurate, misleading, or otherwise in violation of the student’s privacy or other rights.
- The right to file a complaint with the US Department of Education concerning perceived failure on the part of the school to satisfy the requirements of FERPA.

FERPA also limits the disclosure of personally identifiable information to others without the student’s prior consent with the following exceptions:

Directory Information

Certain categories of information are considered to be directory information and do not require the student’s prior written consent to be disclosed. However, the medical school registrar’s office complies with a student’s request to withhold directory information if notice is submitted in writing during the first three weeks of each new academic year; such requests must be renewed annually. Students considering nondisclosure should be aware that negative repercussions may result when inquiries are made by prospective employers, educational institutions, or other

interested parties. This is particularly important for graduating students whose final nondisclosure requests continue to be honored until rescinded by the student.

The following have been designated as directory information by the university: name, address, telephone listing, e-mail address, date and place of birth, photograph, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and most recent previous educational institution attended.

Legitimate Interests

The university discloses education records without a student's prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests. A school official is a person employed by the university in an administrative, supervisory, academic or research, or support staff position (including law enforcement unit personnel and health staff); a person or company with whom the university has contracted as its agent to provide a service instead of using university employees or officials (such as an attorney, auditor, or collection agent); a person serving on the Board of Trustees; or a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her tasks. A school official has legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for the university. Prior consent is not required for disclosure of education records to school officials of Duke University who have been determined to have legitimate educational interests, appropriate parties in connection with an emergency, and in response to a court order or subpoena.

The complete university policy regarding FERPA is located on the website for the university registrar at <http://registrar.duke.edu/student-records>.

Graduation from Degree Programs

Students may earn degrees on one of three different dates during the academic year: September 1, December 30, and in early May. Actual ceremonies are only held at the end of the spring term. Anyone who has a degree date of December or September is invited to participate in the May commencement program immediately following his/her actual graduation date.

Students are required to apply for graduation on-line through their ACES accounts. Students are sent e-mail notifications to advise of the dates and times for the on-line apply for graduation periods.

Student records are reviewed by the registrar's office staff to ensure that, upon successful completion of the current courses, graduating seniors will fulfill degree requirements on schedule. Those students who are deficient are contacted by the registrar's office to inform them of the situation and to discover how they plan to rectify the problem, e.g., add a course, graduate in September instead, etc.

It is extremely important that students wishing to be graduated in absentia inform the Office of Student Affairs (medstudaff@dm.duke.edu) of their intentions prior to graduation. Diplomas are sent to such students to the address they provide when applying on-line for graduation.

Health Insurance Portability and Accountability Act (HIPAA)

The Health Insurance Portability and Accountability Act, or HIPAA, requires health care professionals to protect privacy and create standards for electronic transfers of health data. The Office for Civil Rights at the Department of Health and Human Services will enforce the regulations and impose penalties on institutions that do not make a good-faith effort on privacy and security.

HIPAA came about because of the public's concern about how health care information is used. HIPAA gives patients more control over their own health information. All Duke University School of Medicine students are required to complete online HIPAA Compliance Update training on an annual basis via an online training module. This module is located on the occupational and environmental safety office. Their website is <http://www.safety.duke.edu/OnlineTraining/>.

For more information about HIPAA compliance training, please visit <http://www.dukemedicine.org/patients-and-visitors/hospital-information/patient-bill-of-rights>.

Payment Policy for Students Who Do Not Hold US Citizenship or US Permanent Resident Status

Each non-US citizen admitted for enrollment at Duke University School of Medicine is eligible to apply for need-based financial assistance at the time of admission. Financial aid eligibility is determined at the time a student is admitted and the student is notified of their eligibility prior to accepting admission into the School. Funds accepted by the student will credit to the student account. The amount disbursed is dependent on the number of terms a student is enrolled. It is the student's responsibility for paying all required tuition and fees on a semester/term basis.

For questions regarding this policy, please contact the Office of the Bursar, or the Duke University School of Medicine Office of Admissions.

Replacement Diplomas

In the event that a diploma is misplaced or damaged, please contact the Office of the University Registrar, 1121 West Main Street, Suite 1200, Bevan (Coca-Cola) Building, Campus Box 104804, Durham, NC 27701; (919) 684-2813. The office can replace the document for a nominal fee. The university registrar's office will provide you with a form that must be completed and notarized. The individual concerned must certify in writing that the diploma is truly lost and that if found in the future, the replacement diploma will be returned to Duke University. Damaged diplomas must be submitted to the School of Medicine registrar's office before the replacement can be issued.

Safety/Compliance Training

All students enrolled in Duke University School of Medicine are required to complete annual online compliance and safety training modules. These modules are found on the occupational and environmental safety office website at <http://www.safety.duke.edu/OnlineTraining/>. The required modules are listed on the OESO website, <http://www.safety.duke.edu>. Students will be required to complete some modules through the Learning Management System (LMS). There are some required modules that are required once every two or three years, but that is indicated online. Compliance with these modules is a graduation requirement. Failure to complete the modules by the set due date may result in the placement of a transcript hold and/or a registration block on the student's account. Students who fail to comply during their final year of the Doctor of Medicine program will be presented to their promotions board as failure to meet graduation requirements. Requirements are subject to change based on OESO compliance requirements.

School of Medicine Severe Weather Attendance Policy

The School of Medicine will handle the cancellation of classes in the following manner:

All School of Medicine students will follow the provost's decision in regards to cancellation of classes. If classes are cancelled, students should not report for any medical school activities (classes, labs, clinical assignments, etc.) If students are in classes/rotations when the severe weather policy is implemented, they should leave when classes are cancelled. Course directors, mentors, and faculty are aware of this policy so that individual decisions should not be made.

These decisions can be determined by calling 684-INFO or by visiting the School of Medicine Office of the Registrar's website at <https://medschool.duke.edu/education/student-services/office-registrar>, <http://emergency.duke.edu>, or <http://today.duke.edu/>. Class cancellations are announced on the SOM registrar's office will make every attempt to announce any cancellations on the announcements section of their website, <https://medschool.duke.edu/education/student-services/office-registrar>.

Please note that 684-INFO and <http://emergency.duke.edu> are considered the official communication for inclement weather announcements.

Student Ombudsperson

Students who are not comfortable approaching existing resources (course directors, advisory deans, practice faculty, and the Office of Institutional Equity) when they feel mistreated or have a conflict with another member of the School of Medicine community, may contact the Student Ombudsmen. The Student Ombudsmen provides a confidential and anonymous resource to help students decide how they want to handle such circumstances and what their options are, and to provide mediation if desired.

The other resources remain available should students wish to use them or wish to report their concern to the administration or have them documented. To contact the Ombudsperson for medical students with a concern you would like to discuss, simply e-mail ombuds@mc.duke.edu or call Dr. Spaulding's office at (919) 668-3326.

Technology Fee

All matriculating students in the School of Medicine are assessed a mandatory technology fee. This includes students enrolled in the following programs: Doctor of Medicine, Doctor of Physical Therapy, Physician Assistant, and Pathologist's Assistant. The fee will not only cover hardware such as laptop or handheld device, but service, software and technical updates to comply to all Duke Health System compliance guidelines.

Transcripts of Academic Record

Current students may request copies of their academic transcripts on-line via their ACES accounts. Alumni students may obtain a copy of her or his academic transcript by completing a transcript request form and forwarding it to the Office of the Registrar, Duke University School of Medicine, Box 3878, DUMC, Durham, NC 27710; (919) 684-4322 (Electronic requests must include facsimile of the requestor and the original signature of the requestor.) Transcripts are released at no charge and only upon consent of the student.

Students may request the School of Medicine registrar's office to send a secure online transcript via e-mail. The requests may be made through ACES.

Transcripts and records submitted from other schools that are on file at the medical school cannot be duplicated and released from the registrar's office.

Immunization Requirements

Immunization and Health Record

North Carolina state law and the Infection Control Committee at the medical center require all new students to provide, within thirty days of matriculation, evidence of immunity to certain vaccine-preventable illnesses. Upon acceptance, students receive the Student Health Immunization Form and Report of Medical History which should be completed and returned June 15, 2015 to the Student Health Center, Box 2899, DUMC, Durham, NC 27710.

Duke University Medical Center and the School of Medicine hold the health and welfare of their students, patients, and faculty in the highest regard. Students' failure to comply with North Carolina state immunization requirements and those of the School of Medicine will result in the student not being allowed to continue coursework or to take exams until all immunization requirements are met. For questions or concerns about immunization requirements, please contact the Student Health Department at immunizations@duke.edu or by phone at (919) 681-WELL.

All incoming Duke students are required to have certain immunizations to meet North Carolina and Duke University requirements. Students in a health professional program have additional requirements. You are encouraged to review and update your records as soon as you can. Failure to meet requirements may result in course scheduling delays. Please refer to <https://studentaffairs.duke.edu/studenthealth/immunization-compliance> for the most current detailed immunization information.

Student and Professional Organizations

Alpha Omega Alpha Medical Honor Society

Alpha Omega Alpha, founded in 1902, is the national medical honor society. The society works to promote scholarship and research in medical schools as well as high standards of character and comportment toward patients among students and physicians. The Duke chapter of AOA was founded in 1931 and has since played an important role in the medical center. For the past thirty years, AOA has sponsored an original studies symposium where third-year medical students present their research findings. The symposium consistently attracts speakers of national prominence to deliver the keynote address. Election into the honor society is restricted to one-sixth of the graduating class. Members are elected in both the third and fourth years of medical school. The primary criterion for election in the third year is superior academic performance as demonstrated by excellent grades in the first two years of medical school. Election in the fourth year is still primarily based on outstanding academic achievement in courses; but additional factors such as comportment toward patients and colleagues, community service, significant research

activities, and other similar accomplishments are accorded greater weight. AOA membership is also conferred upon physicians, including alumni and faculty members who have distinguished themselves in research, teaching, and practice.

Davison Society/Council

The Davison Society is composed of the entire student body. Each student pays a yearly fee that is used to fund various school activities. The Davison Council is the student government organization for the Duke University School of Medicine. The council consists of individuals both elected and appointed to handle matters as they pertain to the entire medical school. The elected officials consist of an executive board (president, social VP, service VP, student activities VP, secretary, and treasurer), a president from each of the four classes, and four representatives from each class. In addition, the Davison Council has appointed members that serve on committees such as the Admissions Committee, Curriculum Committee, Graduate and Professional Student Council, Internal Review Board, Alumni Association, Honor Council, and others. Various national and local organizations are affiliated with the Davison Council and receive money from its treasury. Each of these groups have their own officers and meet periodically.

In keeping with the tradition of graduating well-rounded, happy, healthy physicians, the medical school offers a variety of opportunities by which to get involved with service and social activities. These are two main focuses of the Davison Council. For service, the highlight of our year is Duke in Durham Day, in which the medical school goes out to various sites all over Durham for a day of service. Previous sites include Eno River, The Ronald McDonald House, the Carnivore Preservation Trust, Caring House, Durham Rescue Mission, and many more. In addition, the medical school participates in a fundraiser to buy Christmas gifts for less-fortunate families.

The Davison Council meets monthly to discuss issues that relate to the medical school. The dean of medical education is in constant communication with the council.

Medical student groups affiliated with, and in the past funded by, the Davison Society include Major Groove (A capella), Alternative Careers Interest Group (ACIG), Alpha Omega Alpha (AOA—Medical Student Honor Society), the Association of American Medical Colleges (Organization of Student Representatives), the American Medical Association (AMA—Medical Student Section), the American Medical Women's Association (AMSA), the American Medical Student Association (AMWA), the North Carolina Student Rural Health Coalition (Rural Health, aka Community Health Interest Group), the North Carolina Medical Society Student Chapter, the Student National Medical Association (SNMA), American Physician Scientist Association (APSA), Business, Economics and Medicine Interest Group (BEAM), Benjamin Rush Society (BRS), the Christian Medical and Dental Society (CMDA), the Gay-Straight Alliance (GSA), Epicurean Society (EIG—Medical Student Dinner Club), the Duke Asian-Pacific American Medical Student Association (APAMSA), Latino Medical Student Alliance (LMSA), the Duke Jewish Medical Student Association, Medical Chinese Interest Group (MCIG), MD/MBA Interest Group, Med Mentors, Muslim Medical Student Association (MMSA), Student Curriculum Committee, Duke Institute for Health Care Improvement (IHI Open School), Duke Comprehensive Cancer Center Volunteer Network, AIDS Education Roadshow, Lenox Baker Children's Hospital Program, Duke Medical Gleaning Program, Homeless Shelter Clinic, Children's Miracle Network Fair, the Aesculapian (yearbook), HuMed, Family Medicine Interest Group (FMIG), the Mind-Body Interest Group, Careers in Internal Medicine Interest Group (CIMIGro), Dermatology Interest Group (DIG), Geriatrics Interest Group (GIG), OB-GYN Interest Group, Emergency Medicine Interest Group (EMIG), Global Health Interest Group (GHIG), Infectious Disease Interest Group (IDIG), Pediatrics Interest Group (PIG), Palliative Care Interest Group, ENT Interest Group (OOHNS), Plastic and Reconstructive Surgery Interest Group (PRSIG), Orthopedics Interest Group (Ortho), Cardiology Interest Group (CIG), Physicians for Social Responsibility (PSR), Psychiatry Interest Group (PSYCH), Recovered Medical Equipment for the Developing World (REMEDY), Universities Allied for Essential Medicine (UAEM), Teaching and Mentorship Interest Group (TMIG), the Duke Wilderness Sports Club (DWSC), and Neurology and Neurosurgery Interest Group, and the Medical Ethics and Humanities Lecture Series.

You may find an updated list of officers and student groups at <http://www.dukedavisoncouncil.org>.

Duke Medical Alumni Association

The Duke Medical Alumni Association (MAA) supports and promotes the interests of Duke Medicine and its extended community and to nurture life-long relationships and learning. The MAA contributes a framework through which the Duke Medicine family continues to thrive, alumni concerns are addressed, and alumni participation in the life and vitality of the enterprise is encouraged. Today, the MAA includes more than 12,500 Duke University School of Medicine graduates and former house staff members who live and work in every state across the nation and in forty-six countries around the globe. The association also supports approximately 400

current medical students and 900 house staff officers in various ways. Each year the MAA sponsors events and programs for medical students including Medical Families Orientation; Medical Families Weekend; the Appleseed Award; and the *Aesculapian* (yearbook). The association also provides embroidered white coats for first-year students; Match Day and graduation gifts for fourth-year students; and distributes *DukeMed Alumni News* to current house staff officers.

President: Nicholas J. Leonardy, T' 81, MD '85

President Elect: Katherine S. Upchurch, MD '76

Sarah Nicholson, Executive Director, School of Medicine Development and Alumni Affairs

Academic Calendar—MD Program

Approved by the Curriculum Committee
(Calendar is subject to change)

First Year

Fall 2015

Course Directors: Grades are due within four weeks of the last day of class for each term/each section

August 3	Monday-Friday, Orientation to first year—Mandatory attendance
August 7	Friday, AOA Day—Mandatory attendance
August 10	Monday, Begin class, Molecules, Cells, & Tissues
August 26	Wednesday, Begin class, Intro to Prevention
September 7	Monday, Labor Day, student holiday
September 16	Wednesday, End class, Intro to Prevention
September 18	Friday, End class, Molecules, Cells, & Tissues section 61
September 22	Tuesday, Begin class, Normal Body, section 16
September 22	Tuesday, 2 p.m., Begin class, Practice Year 1
November 4-10	Wednesday, Registration/Drop/Add for Spring 2016 term
November 24	Tuesday, 6 p.m. Begin Thanksgiving student holiday
November 30	Monday, Class resumes Normal Body, section 16
December 18	Friday, 5 p.m., End class, Normal Body Begin Winter Break for 1st year Medical Students

Spring 2016

January 1	Friday, New Year's Day holiday observed
January 4	Monday, Begin class, Brain & Behavior, section 16
January 18	Monday, Martin Luther King, Jr., student holiday
January 29	Friday, End class, Brain & Behavior, section 16
February 2	Tuesday, Begin class, Physical Examination period (Intensive Learning Period)
February 4	Thursday, 5 p.m., End class, Physical Examination Period (Intensive Learning Period)
February 5	Friday, Begin class, Body & Disease, section 16
TBD	Friday, 8 p.m., Student/Faculty Show
TBD	Friday-Saturday, Medical Families Weekend
March 26-April 3	Saturday through Sunday—Spring break for MS1's
April 4	Monday, Resume Body & Disease, section 16 (return from Spring Break)
May 30	Monday, Memorial Day Holiday—student holiday
June 28	Tuesday, End class, Practice Year 1
July 1	Friday, 5 p.m.—End class, Body and Disease, section 16 (Holiday observed on Friday since it falls on a Saturday)

Second Year

Fall 2015

Course Directors: Grades are due within four weeks of the last day of class for each term/each section

August 3	Monday, Begin Clinical Skills Course—Intensive, 8 a.m.
TBD	MS2 students register online for Fall selectives
August 7	Friday, AOA Day—Mandatory attendance
August 21	Friday, End Clinical Skills Course Intensive
August 24	Monday, 8 a.m. Begin sections 21, 41, 61, 81
August 26	Wednesday, Begin Clinical Skills Course
September 4	Friday, End section 21
September 7	Monday, Labor Day, student holiday
September 8	Tuesday, Begin sections 22, 62
September 16	Begin Practice Year 2
September 18	Friday, 6:00 p.m. End sections 22, 41
September 21	Monday, Begin section 23 and 42
October 2	Friday, End section 23 and 61
October 5	Monday, Begin section 24
October 14	Wednesday, 6 p.m. End section 81
October 16	Friday, End sections 24, 42, and 62
October 19	Monday, Begin sections 25, 43, 63, 82
October 30	Friday, End section 25
November 2	Monday, Begin sections 26 and 64
November 4	Monday, 8:30 am-Friday, 1 p.m., online
November 10	Registration for MS2 spring selectives
November 13	Friday, End sections 26 and 43
November 16	Monday, Begin sections 27 and 44
November 25	Wednesday, End sections 27 and 63
November 25	Wednesday, noon, Begin Thanksgiving holiday

November 26-29	Thursday-Sunday, no classes due to Thanksgiving holiday
November 30	Monday, Begin section 28
December 11	Friday, End sections 28, 44, 64, 82
December 14	Monday, Begin Health Policy and Global Health
December 18	Friday, End Health Policy and Global Health
December 19	Begin winter break

Spring 2016

January 1	Friday, New Year's Day, student holiday observed
January 3	Winter break ends
January 4	Monday, Begin sections 21, 41, 61, 81
January 15	Friday, End section 21
January 18	Monday, Martin Luther King, Jr., student holiday
January 19	Tuesday, Begin sections 22 and 62
January 29	Friday, 6 p.m. End sections 22 and 41
February 1	Monday, Begin classes in sections 23 and 42
February 12	Friday, End classes in sections 23 and 61
February 15	Monday, Begin section 24
February 24	Wednesday, 6 p.m. End section 81
February 26	Friday, End sections 24, 42, 62
February 29	Monday, Begin sections 25, 43, 63, 82
March 11	Friday, End section 25
March 14	Monday, Begin sections 26 and 64
March 16	MS2 students register for Summer 2015 selectives
March 22	(students will receive e-mail notification)
March 25	Friday, End sections 26 and 43
March 28	Monday, Begin section 44
April 8	Friday, End sections 26 and 63
April 11	Monday, Begin section 28
April 20	Wednesday, End section 82
April 22	Friday, End section 28, 44, 64
April 23	Saturday, Begin Vacation

Summer 2016

May 1	Sunday, End vacation
May 2	Monday, Begin sections 21, 41, 61, and 81
May 13	Friday, End section 21
May 16	Monday, Begin sections 22 and 62
May 27	Friday, End sections 22 and 41
May 27	Friday, noon deadline for rising third-year (MED3) students, Registration form submission to third-year coordinator
May 30	Monday, Memorial Day holiday, student holiday
May 31	Tuesday, Begin sections 23 and 42
June 3	Friday, Online Registration - 3rd Year, Fall 2016 ends
June 10	Friday, End sections 23 and 61
June 13	Monday, Begin section 24
June 22	Wednesday, End section 81
June 24	Friday, End sections 22, 42, and 62
June 27	Monday, Begin sections 25, 43, 63, and 82
July 4	Monday, Independence Day— student holiday
July 6	Wednesday, End Practice Year 2
July 8	Friday, End section 25
July 11	Monday, Begin sections 26 and 64
July 24	Friday, End classes in section 43
July 25	Monday, Begin sections 27 and 44
August 5	Friday, End sections 27 and 63
August 5	Friday, ADA day - Mandatory attendance
August 8	Monday, Begin section 28
August 10	Wednesday, End Clinical Skills & Practice Year 2
August 13	Saturday, Advisory Dean 2nd Year Retreat, RCR and 3rd Year Orientation - Mandatory attendance
August 17	Wednesday, End section 82
August 19	Friday, End sections 28, 44, and 64

***Mandatory Clinical Skills Assessment due by December 2016 following 2nd year*

Third Year

Fall 2015

Course Director Note: Grades are due within four weeks of the last day of class for each section

August 7	Friday, AOA day—Mandatory attendance
August 24	Monday, Third Year Begins (start dates must be approved prior to scheduled third year registration due date)
August 24	Monday, begin section 41—Step 1 and study period
September 7	Monday, Labor Day, student holiday
September 19	Saturday, MS3 study period ends
September 21	Monday, MS3 begin section 42
October 17	Saturday, MS3 End section 42
October 19	Monday, Begin 43
November 4-10	Wednesday, 8:30 a.m.—MS3 registration for Spring 2016 opens. Registration ends at 1 p.m. on Tuesday, Nov. 10
November 14	Saturday, end section 43
November 16	Monday, begin section 44
November 26	Thursday-Sunday (Nov. 29)—Begin Thanksgiving, student holiday
November 30	Monday, Classes resume
December 12	Saturday, MS3 end section 44
December 12	Saturday, Winter break begins

Spring 2016

January 1	Friday, New Year's Day, student holiday observed—end vacation
January 4	Monday. MS3 Classes Resume or MS3 10 month Scholarly experience begins
January 18	Monday, Martin Luther King, Jr. holiday, student holiday

March 23-29	Wednesday, 8:30 a.m.-Tuesday, 1 p.m., Registration for rising MED, Summer 2016
March 31	Students must have completed Medical Statistics
April 6-12	Wednesday, 8:30 a.m.-Tuesday, 1 p.m., Registration for rising MED3, Fall 2016
April 30	Saturday, End third year, Spring term (= 16 weeks of third year research from first day of classes)
May 30	Monday, Memorial Day holiday, student holiday
July 4	Monday, Independence Day, student holiday
August 5	Friday, AOA day—Mandatory attendance

Summer 2016

May 30	Monday, Memorial Day holiday, student holiday
July 4	Monday, Independence Day, student holiday
August 5	Friday, AOA day—Mandatory attendance

Research Ethics due 30 days after start date

***Mandatory Medical Statistics Course must be completed by March 31st unless the student has been waived from the requirement*

Third year start dates and thesis deadlines must be approved PRIOR to the third year registration form due date

MS3 Students: For more specific information about Thesis due dates, please contact the 3rd Year Coordinator, (919) 684-0859

(Calendar is subject to change)

Fourth Year

Summer 2015

Course Director Note: Grades are due within four weeks of the last day of class for each section

March 18-24	Wednesday, 8:30 a.m.—Tuesday, 1 p.m., Registration for rising MED4, Summer 2015
April 1-7	Wednesday, 8:30 a.m.—Tuesday, 1 p.m. Registration for MS4, fall 20145 (dates subject to change)
April 8	Wednesday, 8:30 a.m., Drop/Add for Fall 2015 opens
April 20	Monday, Begin classes in sections 81, 41
May 16	Saturday, noon—End classes in section 41
May 18	Monday, Begin classes in section 42
May 25	Monday, Memorial Day holiday, student holiday
May 29	Friday, 1 p.m. Drop/Add ends for Summer 2015
June 13	Saturday, noon, End classes in sections 81, 42
June 15	Monday, Begin classes in sections 82, 43
July 3	Friday, Independence Day, student holiday
July 11	Saturday, noon, End classes in section 43
July 13	Monday, Begin classes in section 44
August 7	Friday, 1 p.m., Drop/Add Fall 2015, all sections, closes
August 7	Friday, AOA day—Mandatory attendance
August 8	Saturday, noon, End classes in sections 82, 44

Fall 2015

August 7	Friday, AOA day—Mandatory attendance
August 24	Monday, Begin sections 41, 81
September 7	Monday, Labor Day, student holiday
September 19	Saturday, End section 41
September 22	Monday, Begin section 42
September 24	Thursday, noon, MS4 Grades for 41 are due (for MSPEs)
September 24	Thursday, MS4, Grades for section 41 are Due
October 2	Friday, 1 p.m. Drop/Add, Fall 2015 classes

October 17	Saturday, End sections 42, 81
October 19	Monday, Begin 43, 82
November 4-10	Wednesday, 8:30 a.m. MS4 registration for Spring 2016 opens. Registration ends Friday, 1 p.m.
November 11	Wednesday, 8:30 a.m. Drop/Add for Spring 2016 opens
November 14	Saturday, End section 43
November 16	Monday, Begin section 44
November 26	Thursday-Sunday (Nov. 29th—Begin Thanksgiving, student holiday
November 30	Monday, Classes resume
December 12	Saturday, End sections 44, 82
December 12	Saturday, Winter Break begins
December 18	Friday, 1 p.m. MS4 online Registration for Spring 2016 ends
December 19	Online Drop/Add for spring sections 82, 43, and 44 opens

Spring 2016

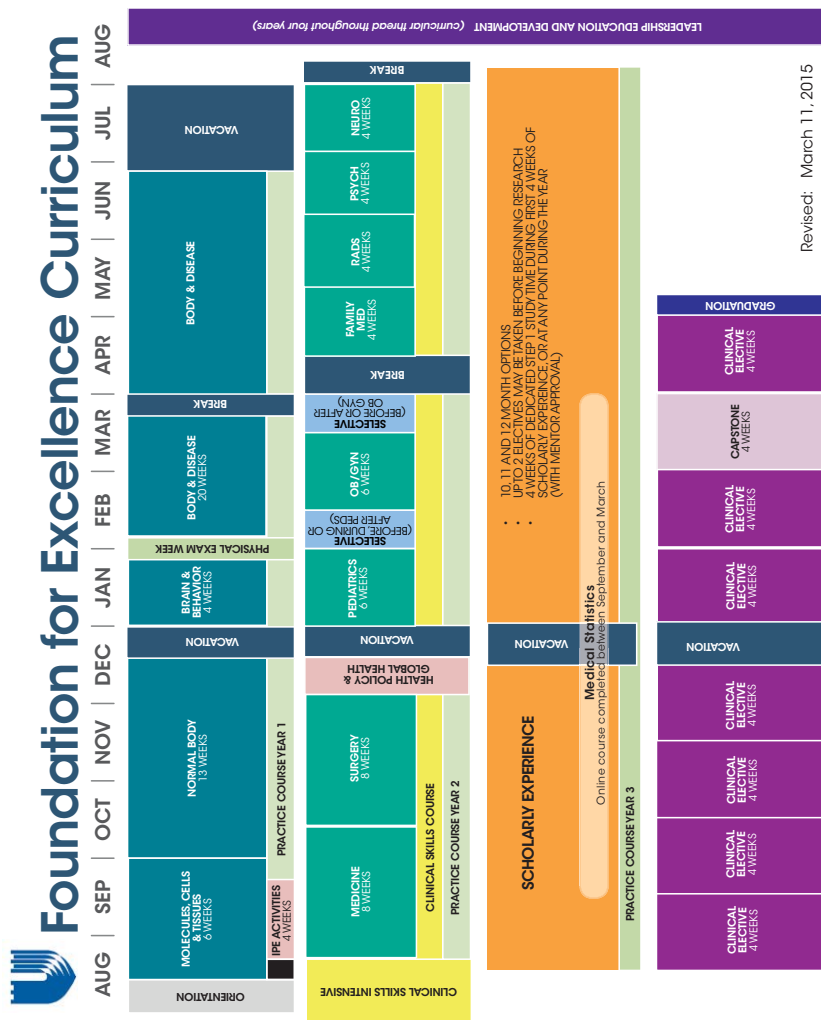
January 1	Friday, New Year's Day, student holiday observed
January 11	Monday, Begin sections 41, 81
January 18	Monday, Martin Luther King, Jr, student holiday observed
February 6	Saturday, End section 41
February 8	Monday, Begin section 42
February 12	Online Drop/Add ends, Spring 2016, Sections 81, 41, 42
February 17-19	Tuesday, 8:30 a.m.-Thursday, 1 p.m.—Online Drop/Add, Spring 2016, sections 43, and 44 (MS4) *section 43 – Capstone is required
March 5	Saturday, End sections 42, 81
March 7	Monday, Begin section 43—Capstone—Mandatory
March 18	Friday, Match Day (tentative date)
April 1	Friday, End section 43, Capstone
April 4	Monday, Begin section 44
April 30	Saturday, End section 44
May 11	Wednesday, 4:00 p.m. all MS4 Grades are due
May 13-15	Friday through Sunday, Graduation activities

Note: All grades must be submitted to the Office of the Registrar by the specified date in order for students to be approved for graduation.

(Calendar and registration dates are subject to change)

Academic Calendar Key

- 11 – 1st one-week Clinical Core of the term
- 16 – entire 16-week term
- 21 – 1st two-week selective of term
- 22 – 2nd two-week selective of term
- 23 – 3rd two-week selective of term
- 24 – 4th two-week selective of term
- 25 – 5th two-week selective of term
- 26 – 6th two-week selective of term
- 27 – 7th two-week selective of term
- 28 – 8th two-week selective of term
- 41 – 1st four weeks of term
- 42 – 2nd four weeks of term
- 43 – 3rd four weeks of term
- 44 – 4th four weeks of term
- 61 – 1st six weeks of clinical rotation (PEDS or OBGYN) of term
- 62 – 2nd six weeks of clinical rotation (PEDS or OBGYN) of term
- 63 – 3rd six weeks of a clinical rotation (PEDS or OBGYN) of term
- 64 – 4th six weeks of a clinical rotation (PEDS or OBGYN) of term
- 81 – 1st eight weeks of term
- 82 – 2nd eight weeks of term



Revised: March 11, 2015

This is a guideline that lays out the individual courses and experiences that are required for completion of the MD degree. The sequence and placement of these events may differ from student to student. For specific details about the curriculum or for information about the Primary Care Leadership Track please consult the Bulletin at <http://registrar.duke.edu/university-bulletin/school-medicine>.

Doctor of Medicine Degree

The degree of doctor of medicine is awarded, upon approval by the faculty of Duke University, to those students who have satisfactorily completed the academic curriculum; demonstrated the intellectual, personal, professional, and technical competencies to function as skilled physicians; and demonstrated their fitness to practice medicine by adherence to a high standard of ethical and moral behavior.

The faculty of the School of Medicine have developed general guidelines for technical standards for medical school admissions and degree completion. These are available on request from the Office of Admissions.

The awarding of degrees is contingent upon payment of, or satisfactory arrangements to pay, all indebtedness to the university.

In February 2008, the Duke University School of Medicine was fully accredited for seven years by the Liaison Committee on Medical Education of the Association of American Medical Colleges.

Course Requirements—First Year

The student studies the principles of all the basic science disciplines. Rather than mastering an encyclopedic array of facts, the purpose is to acquire familiarity with the major principles of each subject. In addition, during the first three years students are required to participate in the Practice course which is designed to expand primary and continuity care experience for Duke medical students. The practice course is a combined clinical curricular experience which emphasizes progressive knowledge and competencies. Year one requires satisfactory completion of 46 course credits in the approved basic science curriculum.

The first year consists of instruction in the following:

Semester 1

- INTERDIS 105B (Practice): 1.5 course credits
- INTERDIS 100B (Molecules, Cells and Tissues): 6 course credits
- INTERDIS 104B (Introduction to Prevention): 1 course credit
- INTERDIS 101B (Normal Body): 12 course credits

Semester 2

- INTERDIS 105B (Practice): 1.5 course credits
- INTERDIS 103B (Brain and Behavior): 4 course credits
- INTERDIS 102B (Body and Disease): 20 course credits

Year One Courses

Year one consists of four integrated basic science courses, the introduction to prevention course, and the practice courses:

- INTERDIS 100B (Molecules, Cells and Tissues) (integration of biochemistry, genetics, and cell biology)—six and a half weeks
- INTERDIS 104B (Introduction to Prevention)—four hours per week for four weeks.
- INTERDIS 101B (Normal Body) (integration of gross anatomy, microanatomy, and physiology)—twelve and a half weeks
- INTERDIS 103B (Brain and Behavior) (integration of neurobiology and human behavior)—four weeks
- INTERDIS 102B (Body and Disease) (integration of microbiology, immunology, pathology, and pharmacology)—twenty weeks
- INTERDIS 105B (Practice)—(doctor/patient relationships, interviewing, physical exam, basic counseling skills)—four hours per week for entire year

Guiding Principles for Year One:

- Integrate material within and between courses
- Incorporate small group, active, and interactive learning opportunities including workshops, seminars, and team-based learning
- Include time for independent learning (generally one-half day of unstructured time per week)

A vacation takes place after the conclusion of the first year. In addition, every class has a holiday on Labor Day, Thanksgiving and the day after, Christmas, New Year's Day, Martin Luther King, Jr. Day, and Memorial Day, with the exact dates depending upon the calendar year. Approved calendars are included in this bulletin as well as published on the <http://registrar.mc.duke.edu> website.

Course Requirements–Second Year

Satisfactory completion of the first-year curriculum is a prerequisite to the second year curriculum. The second year provides an exposure to clinical science disciplines. This permits students early in their careers to become participants in the care of patients. The combined experiences of one year of basic science instruction followed immediately by a year of clinical education is designed to assist students in making a meaningful selection of courses for the subsequent two years. Year two requires satisfactory completion of 56 course credits in the approved clinical science curriculum.

The second year consists of the clinical skills course, eight core clerkship rotations, the Interdisciplinary 204C (Global Health and Health Policy) course, two 2-week selectives, the practice course, and the clinical assessment course.

The goals of the core clerkships include developing students' skills in accurate patient-based problem-solving and appropriate use of resources to diagnose and treat patients. The core clerkship rotations include:

Medicine	8 weeks, 8 course credits
Surgery	8 weeks, 8 course credits
Obstetrics and Gynecology	6 weeks, 6 course credits
Pediatrics	6 weeks, 6 course credits
Family Medicine	4 weeks, 4 course credits
Psychiatry	4 weeks, 4 course credits
Neurology	4 weeks, 4 course credits
Radiology	4 weeks, 4 course credits
Practice - Advanced clinical themes (ethics, professionalism, end-of-life, etc.)	2.5 hours four times during each 8-week rotation, 2 course credits
Clinical Skills Intensive	3 weeks, 3 credits
Clinical Skills Course (longitudinal)	2.5 hours every other week, 2 course credits

Note: Students on the Primary Care Leadership Track (PCLT) must complete the core clerkships, practice, clinical skills, clinical core, assessment, four-week, 4-course credit emergency medicine (SURGERY 252C) rotation, and the required tutorial course.

Elective periods include two 2-week selectives. Selectives provide an opportunity before the fourth year for students to learn about clinical subspecialties that are not covered by clerkships and support career exploration.

Course Requirements–Third and Fourth Years

Satisfactory completion of the second year curriculum is a prerequisite to the third and fourth years. Students must also complete a clinical skills assessment during the first three months of the third academic year. The Clinical Skills Assessment consists of an eight-station clinical performance exam (CPX); written exams covering chest x-rays, ECGs, laboratory interpretation, and medical informatics; and debriefs for all components. The CPX cases are selected to sample a variety of dimensions including patient age, gender, organ systems, and specialties represented through the clerkship year. The major purposes of the CPX are (a) to evaluate, in a more standardized way, each student's approach to common patient complaints, demonstrating the orchestration of history-taking, physical examination and communication skills that cannot be adequately assessed through written tests, (b) to provide a measure of curriculum effectiveness and (c) to prepare students for Step 2 CS, a standardized patient-based assessment that is part of the physician licensing system in the United States. This preparation is achieved by giving students an experience that closely resembles the actual Step 2 CS. Passing each component of the clinical assessment is required for graduation.

Students must complete ten, eleven, or twelve months of scholarly investigation; seven clinical electives; and a four-week capstone course. Students may opt to take one, two, or three clinical electives before beginning the period of scholarly investigation.

INTERDIS 305C (Continuity Clinic)

Practice Course Year 3

All students are required to complete the continuity clinic requirement. A continuity ambulatory (outpatient) care experience, Practice Year 3 is recommended of third year students and is designed to teach students patient

outcomes over time. Study away and scholarship students who may not be able to take the course in their third year must take in their fourth year. However, you can take the course at your location with the following identified: what contact you will have with patients, the type of patients, and the length of time you spend with patients. The outpatient clinic experience is 34 weeks, one-half day a week. Twenty-two weeks are required in an approved continuity ambulatory site, primary care sites being the most likely to be approved. Specialty care sites (medicine or surgery) may be approved, if at least 50 percent of the patients are seen on a continuing basis with typical follow-up in 1-3 months for the 22 weeks. Approval for this is required by the Practice Course Director. Students may arrange to use 12 of the 34 weeks to pursue non-continuity outpatient clinic experiences (e.g., specialty clinics that do not see patients back before three months, if at all). Notification of the Third Year Coordinator is required prior to starting, and attendance must be documented by the preceptor. A student may choose to do all 34 weeks at the same approved site. Credit: 3.0. Enrollment: max 120. *Nancy Weigle, MD*

Students will delay this requirement to the fourth year as a one-month approved elective if they are exempt (see Number 1 below). Exemptions are posted on BlueDocs but it's usually HHMI and most Study Away students. Study Away students may request a clinic at their prospective locations, but it will need to be cleared through your advisory dean's office.

1. Every Year 3 research student must have approval from their research mentor to take INTERDIS 305C in Year 3. **Those not having approval from their mentor are exempt from taking the clinic in Year 3. Written notification from the research mentor must be provided to the Registrar's office.** In addition, students not required to take it in Year 3 are students doing research out of state, those in another professional degree program, those with scholarships which prohibit course enrollment and MD/PhD (MSTP) students.
2. A Year 3 research student who is **not exempted, and not completing** 305C in Year 3, will be required to take 4 credits (by electives listed below in #7) **in addition** to their (28) Year 4 credits.
3. Students make arrangements with a preceptor for this clinic placement prior to registration. This is done by completing the Preceptor Approval Form obtained from the Third Year site in BlueDocs. Forward the form to Sherry Burton. **You must have the approval in place prior to your first day of clinic.**
4. Students may request assignment to a preceptor by the Practice Course.
5. INTERDIS 305C (Continuity Clinic) is a 3 credit course. You must begin clinic in the first term of your official Scholarly Experience and enroll in one more consecutive term. For example, if you start in Fall you will enroll in Fall and Spring; if you start in Spring you must enroll in Spring and Summer Terms Grade will be entered and credit will be awarded in last term.
6. Exempted students (as defined in #1 above) will meet the requirement by taking an elective in Year 4 that offers full time outpatient clinical work for **4 course credits**. Please refer to "Fourth Year Requirements for a listing of courses that meet this requirement. The credits earned (by exempted students) for these courses will fulfill 305C and the (28) Year 4 credit requirements at the same time.

Scholarly Experience

The purpose of the scholarly research experience is to provide the student with an opportunity to focus in an area of interest and to pursue, in depth, scholarly investigation. Two different avenues to satisfying the scholarly experience requirements are available. The first requires the student to select a home base study program for the scholarly experience. With the aid of advisors, the student's research program is devised to include an area of concentration. A combination of a research preceptorship, tutorials, and a thesis comprise the overall scholarly experience.

The second path open to students is participation in a combined MD/PhD program or MD/master's degree program in clinical research, public health, business administration, public policy, law, library science, information science management of clinical informatics or global health. During the scholarly experience, students are required to complete 36 course credits including three clinical science credits for the required Practice Year Three. Students also must complete a quantitative thesis (or qualitative in the medical humanities study program track) for 3 course credits. Specific requirements related to the thesis and scholarly experience can be found on the third-year website. During the scholarly experience, students also are required to complete research ethics modules and medical statistics, mid-term progress report, an oral presentation and present at AOA Day.

Students on the ten and eleven-month Scholarly Experience tracks (and twelve-month track if allowed by the parameters of their scholarship) are allowed four weeks of Step 1 preparation (independent study) at any point during their scholarly experience. Students must complete the appropriate Independent Study form and obtain approval

from their study program director, mentor, and advisory dean. The Independent Study form is submitted to the Office of the Registrar for processing.

Students are allowed to complete one clinical elective prior to submission of their thesis (unless there are scholarship restrictions concerning clinical work). However, if students request to take more than the allotted one clinical elective, interrupting their third year scholarly experience, they must meet with their Advisory Dean to discuss why they need to interrupt their scholarly experience to take an additional clinical elective. The Advisory Dean will provide an explanation as to the need of the interruption. The student is required to obtain permission from their mentor as well as the scholarship committee, if applicable. The completed form will be reviewed by the Third Year committee for final approval.

Clinical Electives

Clinical electives should be used to (a) aid in decision-making about the area of choice for postgraduate training, (b) obtain experiences in areas that would not be included in that postgraduate training and, above all, (c) pursue active experiences in patient care sufficient to provide the basic skills necessary for doctor-patient interaction.

Students must complete 28 course credits of clinical electives including several required rotations designed to enhance students' preparation for their internships and residencies:

- Subinternship
- Critical/Acute care
- Continuity clinic (only if not completed in the third year)

Additionally, students participate in a four-week required capstone (Interdisciplinary 450C) course in March that includes Match Day. The capstone course provides an opportunity to bring the whole class together to cover topics such as:

- clinical skills for internship;
- ethical issues;
- professionalism;
- doctor/patient communication;
- medical/legal issues;
- health systems;
- patient safety;
- self-care; and
- advanced basic science principles.

Fourth-Year Course Requirements

Fourth-year students who do not satisfy the practice requirement for Year Three, must successfully complete a four-week, 4-course credit course from the approved list of practice electives. The credits earned (by exempted students) for these courses will fulfill Interdisciplinary 305C and the 28-course credit requirement for the fourth year at the same time.

If you were NOT exempt from the third-year Continuity Clinic requirement (Practice Year 3) but did not complete it, you are required to complete an approved outpatient course during your fourth year but must add an additional 4 course credits to the required 28 course credits. You will be required to complete a total of 32 fourth-year course credits in order to be cleared for graduation. Note: Students entering the School of Medicine prior to fall 2011 must complete 32 course credits during the fourth year and will be required to complete an additional four credits if they did not complete the Continuity Clinic (Practice Year 3) during the fourth year and were not exempt by their mentors. This means that a total of 36 course credits would be required in order to satisfy graduation requirements for those students.

Eligible courses that satisfy the Continuity Clinic requirement are:

- ANESTH 446C (Acute and Chronic Pain Management)
- COMMFAM 401C (Subinternship in Family Medicine)
- COMMFAM 423C (Occupational and Environmental Medicine)
- COMMFAM 435C (Health Promotion and Disease Prevention)
- COMMFAM 440C (Primary Care Sports Medicine)
- COMMFAM 441C (Family Medicine Continuity Experience (outpatient))
- COMMFAM 449C (Advanced Preceptorship in Community and Family Medicine)
- DERMATOL 450C (Clinical Dermatology)

- MEDICINE 415C (Clinical Management of Obesity)
- MEDICINE 431C (Adult Allergy and Clinical Immunology)
- MEDICINE 434C (Outpatient Hematology-Oncology (Duke or Durham VA))
- MEDICINE 449C (Geriatric Medicine)
- PEDS 410C (Section "C" - Pulmonary, Advanced Pediatrics (outpatient) (*must have permission from Dr. Nancy Weigle*))
- PEDS 430C (Healthy Lifestyles Program: A Clinical, Family-Based Approach to Pediatric Obesity)
- PEDS 431C (Clinical Pediatric Cardiology)
- PEDS 433C (Allergy and Clinical Immunology)
- PSYCHTRY 443C (Addiction Psychiatry)
- RADONC 415C (Radiation Oncology)

Also, all fourth year students are required to have completed clinical electives that fulfill the following criteria by the time of graduation:

- a four-week, five-credit subinternship experience in the field of their choice, which must be completed at Duke
- a four-week, four- or five-credit critical care elective, which must be taken at Duke. Enrollment in the following courses would meet this requirement. If the student has had a placement in an Intensive Care Unit to meet their subinternship requirement, they should select one of the other course options to meet the critical care requirement. Students must complete a course that satisfies the critical care requirement and a second course to satisfy the subinternship requirement.

Also, all fourth-year students are required to have completed clinical electives that fulfill the following criteria by the time of graduation:

**Courses that count toward
Critical Care requirement**

ANESTH 440C
 ANESTH 441C
 MEDICINE 404C
 MEDICINE 405C
 MEDICINE 406C
 MEDICINE 407C
 NEURO 401C
 PEDS 426C
 PEDS 440C
 SURGERY 412C
 SURGERY 441C
 SURGERY 443C

**Courses that count toward
Subinternship requirement**

ANESTH 441C
 COMMFAM 401C
 MEDICINE 401C
 MEDICINE 402C
 MEDICINE 404C
 MEDICINE 405C
 MEDICINE 406C
 MEDICINE 407C
 MEDICINE 408C
 NEURO 401C
 NEUROSUR 401C
 OBGYN 447C
 ORTHO 429C
 PEDS 401C
 PEDS 426C
 PSYCHTRY 401C
 PSYCHTRY 407C
 SURGERY 401C
 SURGERY 402C
 SURGERY 403C
 SURGERY 435C
 SURGERY 441C
 SURGERY 448C
 SURGERY 451C

Leadership Education and Development (LEAD) Program

The LEAD Program offers a standardized leadership curriculum that will be required of all students during each of their four years in the Doctor of Medicine Program. Students will gain knowledge of leadership theory as well as skills in self-assessment, teamwork, communication, adaptability, innovation, and mentorship. Effective with the entering class of Fall 2013, students may earn up to one half of a credit for successful completion of all LEAD requirements. The credit will be applied during the fourth year and students will be required to complete 28.5 course credits during the fourth year.

Primary Care Leadership Track

Director: Barbara Sheline, MD, MPH; Co-Directors: Joseph Jackson, MD, Bruce Peyser, MD. Approved May 2010
Duke University School of Medicine approved a major curricular overhaul to train a cadre of primary care leaders who can enter residency prepared to engage with communities and practices to help improve health outcomes. This project builds on a long-standing partnership between Duke and the Durham community to understand the causes of health disparities, create a strong research focus on community engagement for a population health approach to the redesign of clinical programs.

The clinical year is a longitudinal integrated clerkship year (LIC). Students will do the majority of the clinical training in outpatient primary care practices as well as follow a patient panel over the year.

Goal: Students committed to primary care will be specifically recruited and participate in an innovative four-year curriculum designed to develop skills needed for community-engaged, population-based practice. Students who commit to stay in primary care will receive a scholarship of up to \$40,000 in the fourth year if they match in a primary care specialty.

Overview of the Four Years

Year One: Students in the PCLT participate in a leadership course that focuses on team skills, visioning, service, and self-care/resiliency. They will complete the first-year Duke science curriculum and the Practice Course with traditional students.

Year Two: PCLT students have a seven-month outpatient experience (LIC). Students will have four months of inpatient immersion experiences. Students will take coursework in community engagement, cultural competence and health literacy. Practice course continues through Year Two. Additional training will prepare PCLT students for working in a patient-centered medical home.

Year Three: The scholarly focus of the third year will be community-engaged research, population studies, or other forms of investigation of health systems and improvement in collaboration with the Division of Community Medicine. All PCLT students will complete coursework in epidemiology and biostatistics. The third year will still have a ten-, eleven-, or twelve-month option.

Year Four: PCLT students will choose from a variety of electives available to all students, with emphasis on those that will best prepare them for their career in primary care. Students will also complete the required subinternship, the critical care month and the capstone course.

Dual Degree Programs

Medical Scientist Training Program

Director: Christopher Kontos, MD, Associate Professor in the Department of Medicine
Duke University School of Medicine Medical Scientist Training Program, administered under the auspices of The Graduate School and the School of Medicine, is designed for students who have strong backgrounds in science and who are interested in research careers in the medical sciences and academic medicine. The program, which leads to both the MD and PhD degrees and typically takes seven to eight years to complete, integrates the clinical curriculum of the School of Medicine with graduate education in one of the sciences basic to medicine. Although the emphasis of the program is on basic medical science, the additional clinical component affords program graduates a remarkable range of career opportunities. Graduates typically follow one of two broad paths: Some go directly into careers in teaching and research in one of the basic medical sciences; others enter residency programs before pursuing investigative and teaching careers in clinical medicine.

Eligibility

An applicant must meet both the PhD degree admission requirements of The Graduate School and the MD degree admission requirements the School of Medicine. Most candidates apply for admission to the first year of the MD program, but a few students are admitted each year after completing the second or third year of the School of Medicine. In addition to the minimum requirements for acceptance into The Graduate School and the School of Medicine, advanced coursework in science and mathematics and significant prior research experience count heavily in the selection of candidates. Evidence of the potential for serious investigative work as a physician-scientist is essential. Because a significant portion of the program's funding is provided by a National Institutes of Health training grant, program participants must be US citizens or official permanent residents of the United States.

Financial Support

All students admitted to the program receive a full fellowship award: tuition, fees, health insurance, and a stipend to cover living expenses. The stipend for 2014-2015 is \$29,420 per year. The program provides fellowship funds for three medical school years and the early portion of the PhD study. The student's PhD mentor provides financial support for the student in the upper-level PhD years. Tuition for the third year of medical school is forgiven for MSTP students contingent upon completion of the PhD. Support for the fourth medical school year is contingent upon completion of the PhD, and the PhD degree must be completed within seven years of the end of the second medical school year in order to qualify the student for financial support in the last medical school year. This fellowship support is intended to enable students to devote full time to their work toward the two degrees. All years of fellowship support are contingent upon enrollment in either the School of Medicine or The Graduate School, satisfactory progress toward the two degrees, and no gainful employment.

Admissions Procedure

- Applicants to Duke MSTP apply simultaneously to MSTP and Duke University School of Medicine. Applicants not admitted to MSTP remain eligible for admission to the School of Medicine if they choose to be considered for the MD program.
- The Medical College Admission Test should be taken, if possible, in April of the year in which the application is submitted, and the application should be completed and submitted as early as possible to facilitate review by both the MSTP and School of Medicine admissions committees.
- The Duke AMCAS application deadline is October 15 and the supplemental application to MSTP is due no later than November 15.
- Interviews of selected candidates are held from early October through the end of January, and admissions decisions are announced in late February.
- Applicants admitted to MSTP will be asked to complete additional paperwork for The Graduate School. The Graduate Record Examination is not required for this purpose.

The Training Program

Duke University School of Medicine's unique third-year research curriculum fits well with a dual degree program. The third year of medical school is essentially the first year of the PhD program, thereby shortening the time-to-degree for the dual-degree student by a year. The typical student spends the first two years in medical school, followed by about four years in a PhD program (which serve as the third medical school year) and then returns to a fourth year of medical school. The coursework in the first medical school year provides a solid grounding in the basic medical sciences. The second year is devoted to a clinical sciences curriculum. Following completion of the second year, the trainee enters a graduate program to complete the requirements for the PhD degree. A final academic year of elective clinical study completes the requirements for the MD degree.

While the typical student follows the plan outlined above, students whose research interests are well developed early in the first year may opt to begin the PhD at the beginning of their second year and then complete the clinical sciences curriculum after finishing the PhD. While this is not the typical sequence, much latitude is granted to students interested in early research experiences.

The Curriculum

Year One—Core Basic Science Year (46 basic science credits). The student studies the principles of the basic science disciplines. Rather than mastering an encyclopedic array of facts, the purpose is to acquire familiarity with the major principles of each subject. In addition, during the first three years, students are required to participate in the Practice course which is designed to expand primary and continuity care experience for Duke medical

students. The practice course is a combined clinical curricular experience which emphasizes progressive knowledge and competencies. Year One requires satisfactory completion of 46 course credits in the approved basic science curriculum.

Year One consists of four integrated basic science courses, the interprofessional introduction to prevention course, and the practice courses

- INTERDIS 100B - Molecules and Cells (integration of biochemistry, genetics, and cell biology)—six and a half weeks
- INTERDIS 101B - Normal Body (integration of gross anatomy, microanatomy, and physiology)—twelve and a half weeks
- INTERDIS 102B - Body and Disease (integration of microbiology, immunology, pathology, and pharmacology)—twenty weeks
- INTERDIS 103B - Brain and Behavior (integration of neurobiology and human behavior)—four weeks
- INTERDIS 104B - Interprofessional Introduction to Prevention—four hours per week for four weeks
- INTERDIS 105B - Practice (doctor/patient relationships, interviewing, physical exam, basic counseling skills)—four hours per week for entire year

Year Two—Core Clinical Science Year (56 clinical science credits). The second year consists of a Clinical Skills Course, eight core clerkship rotations, the global health and health policy course, two 2-week selective period, the practice course, and a summative clinical skills assessment. The goals of the core clerkships include developing students' skills in accurate patient-based problem-solving and appropriate use of resources to diagnose and treat patients.

The core clerkship rotations include:

- MEDICINE 205C or 206C - Medicine: eight weeks, eight course credits
- SURGERY 205C or 206C- Surgery: eight weeks, eight course credits
- OBGYN 205C or 206C- Obstetrics and Gynecology: six weeks, six course credits
- PEDS 205C or 206C- Pediatrics: six weeks, six course credits
- COMMFAM 205C or 206C - Family Medicine: four weeks, four course credits
- PSYCHTRY 205C or 206C - Psychiatry: four weeks, four course credits
- NEURO 205C or 206C- Neurology: four weeks, four course credits
- RADIOL 205C - Radiology: four weeks, four course credits
- INTERDIS 205C or 206C- Practice: (Four hours every other week for the entire year)—Advanced clinical themes (ethics, professionalism, end-of-life, etc.) Elective periods include two 2-week selectives. These elective periods provide an opportunity before the fourth year for students to learn about clinical subspecialties that are not covered by clerkships.

Years Three, Four, Five, (Six)—The Graduate Years. During the third, fourth, fifth and, if necessary, sixth year of the program, the trainee pursues graduate study to satisfy the requirements for the PhD degree. A student may begin graduate school after the first year of medical school, in which case, the student returns to finish the Core Clinical Science Year and the Elective Year in Clinical Science consecutively. PhD requirements include: (1) completion of necessary coursework, (2) adequate performance in the preliminary examination, (3) original research suitable for a dissertation, and (4) successful defense of the thesis in the final examination. Detailed descriptions of the other general requirements for the PhD degree are stated in the [Bulletin of Duke University: The Graduate School](#).

The graduate curriculum of each trainee is developed in consultation with the director of graduate studies of the department in which the trainee elects to study and requires the approval of the Medical Scientist Training Program Committee. Since most of the ordering ideas and experimental techniques of all the medical sciences derive from mathematics and the physical sciences, it is essential to ensure that all students in the program have an adequate foundation in these subjects. Because of the close working relationship and geographical proximity of the departments of medical and physical sciences at Duke, the setting is unusually favorable for the achievement of that goal.

Descriptions of the graduate courses in the departments of biochemistry, biology, biomedical engineering, cell biology, chemistry, immunology, molecular genetics and microbiology, molecular cancer biology, neurobiology, pathology, pharmacology and cancer biology, and the University Program in Genetics and Genomics are listed in the [Bulletin of Duke University: The Graduate School](#). Trainees are encouraged to select courses which relate to their developing individual interests rather than follow a prescribed curriculum applied to all students in a given

discipline. Such range, flexibility, and freedom are the essence of graduate education. The original research and dissertation of each trainee is supervised by a faculty advisor chosen by the trainee in consultation with the director of graduate studies in the appropriate department. The faculty adviser is the chair of the trainee's supervisory committee, which consists of at least three members from the major department. This committee generally administers the preliminary examination before the student commences original research and the final examination after the student completes the dissertation.

Students can elect to take one noncredit, continuity clinical preceptorship throughout their graduate years to maintain some clinical contact during their graduate school.

Final Year—An Elective Year in Clinical Science. In this year, which is entered only after completion of all requirements for the PhD degree, the student and her or his medical school advisory dean construct an individualized curriculum which often places major emphasis on one clinical area and minor emphasis on other fields. Students are required to complete a sub-internship, a critical care selective, a continuity clinical preceptorship and capstone course. One aim is to integrate research interests and clinical experience in such a way that the student's research competence is facilitated; therefore, the year is planned with regard to the trainee's proposed career in research, as well. This elective year provides further training in clinical medicine to complement the second (core) clinical year, so that the trainee's total clinical experience is the same as that given in the regular clinical years of medical school (the third and fourth years in the majority of schools). It should be noted that since students in the program receive the MD degree upon completion of the final year, great care is taken by the faculty to ensure that students are competent and knowledgeable in current concepts of patient care. It is hoped that the final year provides the student with an experience which is not repeated during the residency but serves to complement later phases of training. For example, future surgeons might be exposed to fields other than surgery, since they receive intensive training in that discipline during their residency programs. For more information on fourth-year course requirements, please refer to the Doctor of Medicine section of the bulletin, under "[Fourth-Year Course Requirements](#)" Additional information may be obtained by writing Medical Scientist Training Program, Box 102005 Duke University Medical Center, Durham, NC 27710, calling (919) 684-2412, or e-mailing MSTP@duke.edu.

Withdrawal from the MST program prior to completion of the PhD degree requirements. Students who leave the MST Program in their first year of graduate school will be required to complete all of the requirements of the medical school's third year. Research activities performed during this year are not considered sufficient to fulfill the third year study program requirements because:

1. The goal of the graduate rotations is to expose students to the research environment of a laboratory and the mentoring style of the PI, and not necessarily to complete a piece of in depth research.
2. The short (two to three months), self-contained rotation project is the means by which a student learns about a laboratory and is performed on a part-time basis because the student is concurrently enrolled in courses.
3. The student does not necessarily contribute to research design or the intellectual direction of such projects. In contrast, a third-year study project is designed to require ten to twelve months of full-time research under a single mentor, culminating in a document over which the student is rigorously examined. The student is responsible for the research design and execution, as well as the intellectual and scholarly underpinnings and trajectory of the work.

Students leaving graduate school after completing their first year of graduate school may be eligible for full or partial credit toward their third-year project requirements. Suitability of their research experience in graduate school for fulfilling their third-year medical school requirements will be determined by the third-year program study committee. They will be required to fulfill the thesis, coursework, and examination requirements of the third year of medical school plus the remainder, if any, of the research experience.

All students leaving the MSTP program at any time before completing the PhD degree will be responsible for all tuition and fees associated with enrollment in the medical school for the third year. This is applicable regardless of whether full or partial credit is given for the research portion of their graduate work toward fulfilling the third year requirements. Students will be removed from MSTP funding when they dematriculate from the MST Program, but may apply for School of Medicine financial aid programs.

(Approved: March 2008)

Master of Arts in Clinical Psychology

After successful completion of the first two years in the School of Medicine, students may apply for a master's degree in clinical psychology. Interested applicants must be second year medical school students with a demonstrated

aptitude and established interest in behavioral medicine. Students enrolled in this program must complete a minimum of 30 course credits which must include 24 course credits of graded courses. This must be approved by the psychology department and School of Medicine mentors and school administrators. The work will be reported in a document that will serve as a third-year thesis for the School of Medicine and area paper for the Department of Psychology. Students will be required to defend their paper to a committee composed of three members, which will include at least one individual from the School of Medicine and from the Department of Psychology. The members will be chosen by the program administrators. Students are required to meet all requirements of the School of Medicine third year curriculum (e.g., completion of IRB modules).

Applications: All applications must be submitted to the Department of Psychology during the second year of medical school by December 1 (the year prior to beginning the program). Letter of intent recommended to be submitted by September 1.

Tuition: Students will be required to pay one year tuition to The Graduate School as well as their four years of medical school tuition.

For more information, please contact Andrew Krystal, MD, at andrew.krystal@dm.duke.edu.

MD/Master of Arts in Liberal Studies–MD/MALS

This joint degree program of the Duke University graduate liberal studies program and the School of Medicine would begin in the third year of a student's medical degree. It would be a two-year program in its first implementation. Options for creating a one-year program to be situated in the third year of medical school will be explored in future.

The Master of Arts in Liberal Studies (MALS) program offers this joint degree program of the Duke University Graduate Liberal Studies department and the School of Medicine would begin in the third year of a student's medical degree and is a two-year program. The Master of Arts in Liberal Studies program offers the rigor of a graduate-level liberal arts education within an interdisciplinary context. For medical students, the value of this degree is substantial. The program enables students to expand their intellectual capacity in diverse areas of study (e.g., social sciences, history, policy, ethics, etc.) while exploring these subjects from many perspectives. MALS students hone their abilities to view issues and problems from a variety of points-of-view, gaining both intellectual and practical skills that make them more comprehensive thinkers and more effective problem solvers.

The objectives of a MALS degree are to extend students' intellectual resources and range, promote openness to new ideas and ways of thinking, and facilitate the ability to identify connections and inter-relationships among seemingly disparate subject areas. To meet these objectives, liberal studies seminars are designed specifically for this program and open to MALS students only. In addition, MALS students may take other courses of interest in The Graduate School.

Requirements: Students design an individual course of study that brings together their intellectual interests and professional goals. Requirements include nine courses and a master's thesis (approved by both the graduate liberal studies program and the School of Medicine).

Apply to the graduate liberal studies program online through The Graduate School. The application deadline for fall is May 15. All MD/MALS theses proposals also will require School of Medicine approval. For more information, contact Donna Zapf, PhD, Director, Box 90095, Durham, NC 27708-0095; (919) 684-3222; dzapf@duke.edu; or Margaret Humphreys, MD, PhD, Medical Humanities Third Year Program Director (919) 684-2285; medh@duke.edu.

MD/MA in Bioethics & Science Policy

Name of Degree: Master of Arts in Bioethics & Science Policy

Curriculum: The MA teaches students how to thoughtfully identify, analyze, and propose solutions to address cutting edge and historical developments in science, medicine, technology and policy. The program provides a foundation in the history, philosophy, legal, social, and theoretical approaches to bioethical analysis, as well as an introduction to science and health policy.

Options/tracks within the degree program: Genomics, Neuroscience, Public Impact & Engagement, Self-Designed track

Degree Requirements: 4 core courses, 4 electives, and a capstone project. Students generally enroll in two semesters of coursework and then in one semester (or summer) devoted to the capstone project, which can be a practicum or a research paper.

Location: North Building, Research Drive, Duke University Campus

Length of Program: Usually one year taken before or after the third year of medical school

Total time to graduation: Typically five years

Tuition Arrangements: Students pay tuition to the MA program during the time enrolled in the program, generally the equivalent of 1 full year, or 3 semesters.

Financial Aid: A select number of merit-based awards may help offset the costs of tuition.

Contact: Lauren Dame, JD, MPH, Associate Director of Graduate Studies, (919)668-0792; Third Year Study Program: Medical Humanities, Margaret Humphreys, MD, PhD, Director, meh@duke.edu, (919)684-2285 or visit www.scienceandsociety.duke.edu.

MD/MHS in Clinical Research (CRTP)

Name of degree: Master of Health Sciences in Clinical Research (two years)

The Duke CTSA Scholarship is a two year scholarship funded by the Clinical and Translational Science Award (CTSA). CTSA scholars will complete two years of mentored clinical research and the Duke Clinical Research Training Program (CRTP). Upon successful completion of all CRTP degree requirements, CTSA scholars will graduate from Duke University with a Master of Health Sciences in Clinical Research (MHSc). The scholarship provides a stipend for each full year of study. Additional funds are applied towards CRTP tuition, insurance costs, and travel expenses to scientific meetings. CTSA scholars will graduate from Duke Medical School a year late and the second year will be classified Continuation of Research Studies.

For additional information: <https://www.dtmi.duke.edu/dtmi-teams/education/ctsa-scholarship-predoctoral-students-cl1>.

David Edelman, MD
Program Director

David.edelman@duke.edu

Terri Young, MD

Associate Program Director

Terri.young@duke.edu

Stephanie Molner, MSW

Program Administrator

Stephanie.molner@duke.edu

MD/MSc in Global Health

Name of Degree: Master of Science in Global Health (two years)

Options/tracks within the degree program: elective options in disease causation and prevention, global environmental health, global health policy and management, and population sciences

Course of study: Two to three semesters of coursework, a field experience to apply learned research methods, and a research-based thesis are required. The first year is leave of absence and the second year is the official Third Year.

Location: Duke Global Health Institute (DGHI) and a variety of international sites/institutions

Length of Program: typically four semesters

Total time to graduation: typically five years, could be accomplished in four and a half years

Tuition Arrangements: full tuition for both programs and is paid independently to the two schools

Financial Aid: eligible and can apply for financial aid at each program for each year enrolled in that program.

Contact for more information: Dennis Clements, MD, PhD, MPH, study program director; or visit <https://globalhealth.duke.edu/education-and-training/graduate/master-of-science>. or Laura Bey, Assistant Director of Undergraduate and Medical School Programs, laura.bey@duke.edu.

Master of Management in Clinical Informatics: MD/MMCI

The School of Medicine in partnership with the Fuqua School of Business offers this one-year degree program to develop the expertise needed by health care as information technology becomes more critical to the delivery of quality patient care and research. Through this unique multi-disciplinary program, students acquire the knowledge and skills to merge technology with research and patient care and help improve human health. The MMCI program is tightly linked with informatics leadership and practice within Duke Medicine. The program meets every other Friday and Saturday for twelve months, from August to August, over four 12-week academic terms. A research experience and project that fulfills third year requirements is substituted for the applied practicum. Tuition for MMCI is paid in addition to medical school tuition. For more information, contact Pat Thibodeau, MLS, MBA, Third Year Program Director for MMCI, patricia.thibodeau@duke.edu, or visit: www.dukeMMCI.org

Master of Science of Information Science: MS/MSIS

The information science degree program is offered by The University of North Carolina Chapel Hill and is designed to prepare students to contribute to the design, development, and maintenance of information systems and networks; to provide leadership in the development of new technologies and new applications relating to the delivery of information to users; and to demonstrate a theoretical knowledge of information science, including the theory of information storage and retrieval, systems science, and social, political, and ethical implications of information systems. Within this degree, students may develop their own specializations through their choice of courses. The master's project is required for UNC-Chapel Hill graduation, but can be used to fulfill Duke's third-year requirements for a research experience and thesis. All coursework will be reviewed and approved by the student's UNC-CH faculty advisor. Students may select a Duke mentor for their research. The program is usually two years (four academic semesters and one summer term). Tuition is paid to UNC-CH directly, in addition to the Duke University School of Medicine. Financial assistance is available and some students may be eligible for in-state tuition.

For more information, contact Pat Thibodeau, MLS, MBA, Third Year Program Director for MSIS, at patricia.thibodeau@duke.edu or visit <http://sils.unc.edu/programs/graduate/msis>.

Master of Science in Library Science: MD/MLS

The degree in library science is offered by The University of North Carolina at Chapel Hill and is designed to develop knowledge and skills around the development, management, and organization of information. Students graduating from this program would be able to assist in the development of information resources, the creation of databases, and the organization and management of information services, including libraries. The curriculum focuses around five functional areas: organization, collection and retrieval, information-related behavior, design and evaluation, and management. Students generally develop an area of concentration and select a number of advanced courses in that area. The master's project is required for UNC-Chapel Hill graduation, but can be used to fulfill Duke's third-year requirements for a research experience and thesis. All coursework will be reviewed and approved by the student's UNC-CH faculty advisor. Students may select a Duke mentor for their research. The program is usually two years (four academic semesters and one summer term). Tuition is paid to UNC-CH directly, in addition to the Duke University School of Medicine. Financial assistance is available and some students may be eligible for in-state tuition.

For more information, contact Pat Thibodeau, MLS, MBA, Third Year Program Director for MLS, at patricia.thibodeau@duke.edu or visit <http://sils.unc.edu/programs/graduate/msis>.

The Medical Historian Program

The Medical Historian Program is conducted under the auspices of the School of Medicine and The Graduate School. Individuals earning the PhD degree in history from Duke may petition the Vice Dean to receive transfer credit that can be applied to the medical school degree if the major subject area is one that is related to the discipline of medicine, health policy, or public health. The combined MD/PhD program typically extends for six years. Students complete the first two academic years in the School of Medicine (the required core basic and clinical courses) prior to taking a leave of absence to enroll in The Graduate School. A range of appropriate courses is available there through the Department of History. Following the completion of the PhD degree, the student resumes requirements for the MD degree.

Application and Admissions Procedures

Applicants must meet the requirements for admission to the School of Medicine and The Graduate School in the Department of History. Candidates who have completed two years of medical school are also considered. In addition to the minimum requirements established by the School of Medicine and The Graduate School, courses in history and in the history and philosophy of science count in the selection of candidates.

Applicants should complete and submit an application form to the Duke University School of Medicine and to The Graduate School for admission to the Department of History.

For more information, contact Margaret Humphreys, MD, PhD, Box 90719, Department of History, Duke University, Durham, NC 27708; meh@duke.edu.

MD/MBA

Name of Degree: Master of Business Administration (two years) leave of absence the first year

Options/tracks within the degree program: Many; health sector management may be most relevant to medical students.

Course of study: Four semesters of coursework, and the summer between the two years is often devoted to practical work in business as well.

Location: The Fuqua School of Business or a business school at another university—must be approved by the third-year committee prior to beginning the program.

Length of Program: usually two years, with requirements of third-year medical school accomplished in second year of degree

Total time to graduation: typically five years

Tuition arrangements: Fuqua charges 1.5 tuition to Duke Students that are completing a dual MD/MBA degree. These students are required to take 65 credits rather than the 79 normal credits. The first year students take classes at Fuqua and Fuqua handles the financial aid for that year. The second year, the student takes classes at both Medicine and Fuqua. Students are charged full medical tuition and the half tuition for Fuqua during the second year. The Medical School financial aid office handles the financial aid for that year. However, there is no reciprocation if you decide to attend another business school outside of Fuqua and will be responsible for dual tuition during your second year.

Financial Aid: eligible and can apply for financial aid at each program for each year enrolled in that program

Contact for more information: Chad Mather III, MD, MBA, richard.mather@duke.edu, Study Program Director or (919)668-8596.

MD/JD

Name of Degree: Juris Doctor (three years)

Options/tracks within the degree program: varies across law schools

Course of study: six semesters of coursework

Location: Duke University School of Law or a another university—(must be approved by the third-year committee)

Length of Program: usually three years, with requirements of third year medical school accomplished in third of degree program (students are on leave of absence status while completing the first year of the JD)

Total time to graduation: typically six years

Tuition Arrangements: Full tuition for both programs is paid independently to the two schools.

Financial Aid: eligible and can apply for financial aid at each program for each year enrolled in that program

For more information, contact David Edelman, MD, MHS, dedelman@duke.edu, study program director.

Medicine and Public Health Program

The Epidemiology and Public Health Study Program is designed for students pursuing third-year opportunities in public health through obtaining a master's of public health degree. It combines formal coursework in epidemiology and population health, allowing students an opportunity to participate in the research design and/or analysis of a research study. Participants will practice skills related to research design, statistical analyses, assessment, health policy, and comparative effectiveness so that they can be effective contributors to improve the system of health care. The focus may be on improved health of the patient or a discrete population but should be transferable to local, state, national, and/or global health issues. Each student selects a Duke faculty mentor in consultation with the study track director.

Eligibility: Students enrolled in the School of Medicine, after satisfactory completion of the first two years of the regular curriculum, may seek a master of public health degree at The University of North Carolina at Chapel Hill (or an alternate accredited school of public health with Third Year Committee approval).

Required Research: Each student will have the equivalent of ten to twelve months of participation in research. Students should identify a mentor, and research topic by spring of the year in which they begin their third year. Ideally, Duke IRB approval is obtained at the same time recognizing that IRB approval is usually necessary through both Duke and other pertinent institutions. Coursework continuously informs their research project. Each student will be required to produce an in-depth thesis analyzing an area of epidemiology, health service research, finance, health systems, or health policy. This research activity extends throughout the year, culminating with the acceptance of the completed thesis, grant or manuscript consistent with Duke third-year requirements. This study track is for students participating in an MPH. For MPH students, the student must apply to the relevant MPH school (and

program within the school) and to Duke University School of Medicine by completing the Duke Third Year Elective Form. For students who plan to apply for an MPH at The University of North Carolina at Chapel Hill, School of Public Health: There are currently five “pre-approved” MPH programs at the School of Public Health. These include epidemiology; health care and prevention; health policy, maternal and child health, and nutrition. The amount of tuition will depend on whether a student is determined to meet UNC-Chapel Hill’s “in state for tuition purposes” criteria and applies accordingly. Interested students should do what they can to maximize their ability to meet these criteria as soon as they believe they have an interest. This determination is made semester by semester. For details, see <http://gradschool.unc.edu/student/residency>.

Students interested in another study track at the School of Public at UNC-Chapel Hill, or an MPH at another university must work with Dr. Kathryn Andolsek early in their second year to petition the Duke third-year committee for “acceptance.” Students complete all requirements for the MPH degree during one (if approved) to two academic years as part of fulfilling their third-year requirement. If interested, they can extend their research for an additional year. At the end of the students’ third year, they are required to submit a quantitative thesis/manuscript/grant application and present their findings orally at a suitable venue to satisfy Duke’s third year requirements, in addition to the requirements of their masters. Upon receipt of the MPH degree and completion of a quantitative thesis, students are awarded a full year of basic science credit toward the MD degree. Students should consult the UNC School of Public Health for information on eligibility, application requirements and deadlines, and course requirements of the degree. Most students are successful in obtaining this degree but it takes a great deal of organization, coordination, and proactive effort. In addition, students may propose an individually tailored study away option which also must be thoughtful, organized, and approved by the Third Year Committee early in the second year.

Financial Aid: eligible and can apply for financial aid for each year enrolled in the program.

For more information, contact Dr. Kathryn Andolsek, MD, MPH, Third Year Study Program Director, at kathryn.andolsek@duke.edu.

MD/MPP

Name of degree: Master of Public Policy (one to two years) but must be organized and discussed early in second year to allow time for applications and approvals.

Options/tracks within the degree program: Varies across schools of public policy

Course of study: Three to four semesters of coursework; master’s thesis is required in both the School of Medicine and the institution selected for the MPP.

Location: Duke Sanford School of Public Policy or a public policy school at another university (must be approved by the Third Year Committee prior to the start of the program)

Length of Program: Usually two years (leave of absence the first year), with requirements of third year of medical school accomplished in second year of degree program; under carefully considered circumstances and with special permission/effort can be completed in sixteen months

Total time to graduation: Typically five years, but can be four (see above)

Tuition arrangements: Full tuition for both programs is paid independently to the two schools.

Financial Aid: eligible and can apply for financial aid at each program for each year enrolled in that program

For more information, contact David Edelman, MD, study program director, at dedelman@duke.edu.

MD/Master of Engineering Dual Degree Program MD/MEng

This five-year program is designed for MD candidates who wish to also obtain a Master of Engineering (MEng) degree with or without certification in Healthcare Innovation and Entrepreneurship (HIE). In brief, the typical third year study will consist largely of the course work detailed below. One additional year will immediately follow the course work. During this additional year, the student will further develop an innovative concept, construct and test a prototype, protect the intellectual property, develop a business plan, and complete a thesis. The MD curriculum requirements for typical years one, two and four (that would be finished in year five for these students) will remain unchanged by this program. Tuition: Students will pay the Pratt School of Engineering tuition for one year after the MS2 year and the School of Medicine tuition for four years (MS1, MS2, MS3 [year 4], and MS4 [year 5]).

Funding: There are possibilities that some funding may become available to offset some of the costs to the student, but this is undetermined and should not be expected. For more information contact Bruce Klitzman, PhD, Third Year Study Program Director for Biomedical Engineering and Surgery.

Courses of Instruction

Anesthesiology

Joseph P. Mathew, MD, MHSc, MBA

Chair, Department of Anesthesiology

Campus Box 3094

Phone: (919) 684-8579; Fax: (919) 681-2923

E-mail: newma005@mc.duke.edu

Assistants: Adam Hartz and Melinda Macalino

Business Manager: John Borrelli

Department/Faculty Information: <http://anesthesia.mc.duke.edu/>

Second Year, Two-Week Clinical Selectives

ANESTH-220C. CLINICAL ANESTHESIOLOGY. (Operating Room). Students will participate in the pre-, intra-, and post-operative anesthetic management of patients while assigned 1:1 to an anesthesiologist. Clinical assignments will include the general and cardiothoracic Operating Rooms, as well as subspecialty areas and pain management. Additional hands-on practice will occur in the Patient Safety Center (human simulator). Didactic sessions will include pre-operative patient evaluation and perioperative risk, anesthetic techniques and monitoring, airway management, pharmacology, physiology, and anatomy; and procedures may include vascular access, airway management, and selected others; Grand Rounds; and other conferences. For more information please contact Katherine Siler via email, siler006@dm.duke.edu or by phone, 919-681-6437. Credit: 2; Max: 4, Min: 1. *Stuart Grant, M.B., CH.B*

ANESTH-221C. PAIN MANAGEMENT. Students will participate in outpatient chronic pain management. Each student is assigned daily to an individual fellow or attending physician who supervises the student's active involvement. This course emphasizes a multidisciplinary approach appropriate for the individual patient. The effect of pharmacotherapy, interventional procedures, physical therapy, and psychological therapy is stressed. Students will observe and assist in various interventional procedures. Students will also attend the weekly pain conference. The course is offered throughout the year. If more than 1 absence is anticipated, the elective should be re-scheduled. Credit: 2 Enrollment max: 2. Location: Duke Pain Clinic, 4309 Medical Park Drive, Durham, NC 27704; arrive first day of rotation @8:00 a.m. Students with questions may contact: Dr. Lance Roy (lance.roy@duke.edu) or they may contact Lindsay Waters at lindsay.waters@duke.edu. Credit: 2. Enrollment: max 2, min 1. *Lance Roy, MD; and Brian Ginsberg, MD*

Fourth Year Clinical Electives

ANESTH-430C. DIVING AND HYPERBARIC MEDICINE. Students participate actively in assigned patient care and clinical projects. Well-focused segments of ongoing clinical work provide intensive exposure to clinical physiology and pharmacology. Students will be assigned an attending physician (mentor), desk and computer space in the Hyperbaric Center. Consultative services are provided for inpatients and outpatients from orthopedics, medicine, radiation oncology, intensive care units, and preoperative and postoperative care units. Specific indications for hyperbaric oxygen therapy are used in clinical care and in developing translational projects. Students are guided in producing concrete clinical presentations and reports related to the field. For more information please contact Dr. Piantadosi at 684-6143. Secondary contact: Dr. Jake Freiburger, 668-0032. Students should meet for rounds on the first day of classes promptly at 7:30 a.m. The location is Hyperbaric Center Library, 0588 White Zone, CR II Building. Credit: 4. Enrollment Max 1. *Claude Piantadosi, MD, and staff*

ANESTH-440C. CLINICAL ANESTHESIOLOGY. The student will participate in the pre-, intra-, and post-operative anesthetic management of patients while assigned to an individual resident or attending anesthesiologist. Usually, (s)he will spend two weeks in the general Operating rooms, one in the Cardio-thoracic Operating Rooms, and a fourth week in subspecialty areas including the Hyperbaric facility, The Acute Pain Management Service, and others. Learning opportunities will include pre-operative patient evaluation, anesthetic technique selection, airway management, pharmacology, physiology, and anatomy, as well as procedures such as vascular access, including central venous and arterial line placement, and patient monitoring. These areas will be reinforced by lectures, Grand Rounds, and other conferences. In the fall, priority in registration is given to students considering careers in Anesthesiology. Students MUST attend the first day of the Section, and are strongly advised not to miss any of the first week.

More than 4 absences are not permitted. Schedules for the class will be emailed out prior to the start of the course. Pre-requisite: Permission of the Instructor is Required. Please obtain permission number from Katherine Siler (katherine.siler@duke.edu). Enrollment Max: 4. NOTE: This course may require rotations at the VA Medical Center. Students must complete the required VA Medical Center paperwork no less than 30 days prior to the first day of classes in order to participate. Secondary Contact: Katherine Siler via email, katherine.siler@duke.edu or by phone, 919-681-6437. Credit: 4. *Alicia Shook, MD and Staff*

ANESTH-441C. SUBINTERNSHIP IN SICU. This course is designed to broaden the student's knowledge and experience in managing critically ill surgical patients. Under supervision, students function as sub-interns in the Surgical Intensive Care Unit (SICU). Students are assigned their own patients and actively participate in daily rounds as part of the SICU team. There is a daily lecture on aspects of critical care. Students take call one night in four and work on a one-on-one basis with SICU house staff in the supervised management of critically ill patients. Time may be spent in the SICU at Duke University Medical Center (trauma, vascular surgery, liver-kidney-pancreas transplantation, general surgery) and/or the SICU at the Durham VA Medical Center (cardiothoracic and vascular surgery, general surgery). There is emphasis on teaching of procedures and techniques necessary for the management of all critically ill patients including hemodynamic assessment and monitoring, cardiovascular resuscitation and use of vasoactive drugs, ventilator management including ARDS, prevention and management of nosocomial infections, and ethical decision making in ICU. Students are formally evaluated by the SICU house staff and the attending physician. Please contact Vikki Grossman at victoria.grossman@duke.edu for more information. C-L: SURGERY 441C. Credit: 5. Enrollment: max 2. *Christopher Young, MD; Kelli Brooks, MD; Ryan Fink, MD ; Soo Kim, MD; Nancy Knudsen, MD; John Lemm, MD; Eugene Moretti, MD/MHSc; Lisa Pickett, MD; John Scarborough, MD; Mark Shapiro, MD; Stephanie Whitener, MD; and Steven Vaslef, MD, PhD. VA Attendings: Atilio Barbeito, MD; Raquel Bartz, MD; Elliott Bennett-Guerrero, MD; Charles Brudney, M.B., CH.B.; Karthik Raghunathan, MD; and Andrew Shaw, M.B*

ANESTH-445C. PHYSIOLOGY & MEDICINE OF EXTREME ENVIRONMENTS. Advanced topics in the physiology and medicine of ambient pressure, immersion, gravity, temperature, and gas composition. Environments considered include: diving and hyperbaric medicine; hot/cold terrestrial and water operations; microgravity and high-g acceleration; high altitude; space. Basic mechanisms and medical management of associated diseases are examined including: decompression sickness; altitude sickness; hypothermia and hyperthermia; hypoxia; carbon dioxide and carbon monoxide poisoning; oxygen toxicity. Practical applications: pressure vessel design and operation; life support equipment; cardiorespiratory physiology measurements at low and high pressure; simulated dive and flight (optional). Prerequisites: Human anatomy and physiology. The course will meet on in the Hyperbaric Center Library (room 0584). Basement, White Zone, Bldg. CR II during the entire Spring semester on Monday and Wednesday evenings at 5:00pm for 90 minutes. Permission of Instructor is required. Those enrolling will need to forward their permission number to the Office of the Registrar (medreg@dm.duke.edu) and the Registrar's Office will enroll the students. Attendance is MANDATORY unless otherwise approved by the course director. For more information contact Dr. Vann at 684-3305 or via email, richard.vann@duke.edu. Secondary contact: Dr. Jake Freiburger: email frei002@mc.duke.edu or by phone at 668-0032. Credit: 3. Enrollment: max 12. *Richard Vann, PhD and John Freiburger, MD/PhD*

ANESTH-446C. ACUTE AND CHRONIC PAIN MANAGEMENT. Students will participate in both inpatient and outpatient pain management. Each student is assigned daily to an individual fellow or attending physician who supervises the student's active involvement. This evaluation and treatment emphasizes a multidisciplinary approach appropriate for the individual patient. The impact of pharmacotherapy including opioids, NSAID's, local anesthetics, adjuvant drugs; interventional procedures such epidural and regional catheter placement, nerve blocks, neurolytic procedures, as well as implantable devices; and physical and psychotherapy is stressed. Students will observe and/or participate in various interventional procedures. In addition to this clinical work, students attend weekly pain conference, and grand rounds. The course is offered each elective period throughout the year. More than two absences must be made up, and if more than five absences are anticipated, the elective should be re-scheduled. Students with questions may contact Dr. Lance Roy (lance.roy@duke.edu) or Lindsay Waters (lindsay.water@dm.duke.edu). Please contact Dr. Roy the week before the rotation for information about where to arrive on the first day. Credit: 4. Enrollment: max 2, min 1. *Lance Roy, MD and Brian Ginsberg, MD*

Clinical Core

Required Courses

INTERSES-204C. HEALTH POLICY/GLOBAL HEALTH WEEK. This one-week mandatory session is designed to expose students to fundamental health economics and global health concepts. Through a variety of learning modalities, students integrate knowledge to consider issues outside the confines of a single discipline. The course develops reasoning skills and fosters team-based learning about population-level health issues. Major components include: the economics of the US health care system; current and proposed payment systems for healthcare; the development process for drugs and devices and their impact upon costs of care; and the impact of pay for performance initiatives on quality and outcomes. Global health content includes: measures of health status, health disparities, and burden of disease; analyzing socioeconomic and demographic features; applying principles of cost-effectiveness, benefits, and harms; and sustainability of an intervention to improve global health. The effects of social, cultural, and behavioral factors on a society's vulnerability to morbidity, and approaches to prevention and control will be considered. For more information please contact Paula Alford at paula.j.alford@duke.edu or 684-2563. *Michel Landry, PhD*

Community and Family Medicine

J. Lloyd Michener, MD

Office: 319 Haynes House

Campus Box 2914

Phone: (919) 681-3178; Fax: (919) 681-5785

E-mail: miche001@mc.duke.edu

Assistant: Rita Bauer

Business Manager: Ellen O'Briant

Department/Faculty Information: <http://cfm.mc.duke.edu>

Required Courses

COMMFAM-205C. FAMILY MEDICINE. This basic course in Family Medicine consists of a four-week clinical clerkship in the second year. The course goal is to provide students with an understanding of the principles of Family Medicine and how these apply in community practice. The course emphasizes continuous and comprehensive health care for people of both sexes and all ages, within the context of their social groups and communities. Particular attention is paid to the diagnosis and treatment of common medical problems and to health maintenance, ambulatory care, continuity of care, and the role of consultants in primary care. Other topics covered include social factors such as the doctor-patient relationship, the role of the physician in the community, and the economics of health care delivery. Students are placed with community-based faculty who are practicing family physicians in communities outside of Durham, principally within North Carolina. Most of these preceptorship sites are in rural communities, providing students with exposure to many issues of rural health care such as farming and other occupational injuries, transportation difficulties, and local customs. Students gain extensive experience in diagnosing and managing patient problems in an ambulatory care setting under the guidance of the department's faculty. In addition, the clerkship provides students with opportunities to see patients in a variety of other settings, including home, nursing home, and community hospital. There is also the opportunity for medical students to be paired with physician assistant students at a community practice site for the purpose of working with mid-level practitioners in a team practice setting. Changes in the rotation are not made less than 12 weeks prior to the start of the clerkship. Credit: 4. *Nancy Weigle, MD*

COMMFAM-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT) - FAMILY MEDICINE. The course goal is to provide students with an understanding of the principles of family medicine and how these apply in community practice. The course emphasizes continuous and comprehensive health care for people of both sexes and all ages within the context of their social groups and communities. Particular attention is paid to the diagnosis and treatment of common medical problems and to health maintenance, ambulatory care, continuity of care, and the role of consultants in primary care. Other topics covered include social factors such as the doctor-patient relationship, the role of the physician in the community, and the economics of health care delivery. Students participate in a team-based longitudinal quality improvement project focusing evaluation of patient care efforts in a primary care practice. Students gain extensive experience in diagnosing and managing patient problems in an ambulatory care setting under the guidance of the department's faculty. In addition, the clerkship provides students with opportunities to see

patients in a variety of other settings, including home, nursing home, and community hospital. Credit: 4. *Nancy Weigle, MD*

Second Year, Two-Week Clinical Electives

COMMFAM-220C. OCCUPATIONAL MEDICINE: PREVENTION & POPULATIONS. This selective provides hands-on experiences in the broad, interdisciplinary field of Occupational Medicine. The focus is to apply key principles of Preventive Medicine, Population Health Management, and Prospective Health through participating in a broad range of Occupational Medicine activities. In clinic visits students will examine patients, interpret multiple types of information (beyond typical medical data), and communicate with key parties. Throughout the Durham area, they will assess worksite/environmental hazards and assist in reporting on them. Working with faculty mentors, students will find and draw upon information resources (many of which may be new to them) to address complex questions. All students will engage in interactive learning modules on prevention, attend didactic sessions on key aspects of Occupational Medicine, and perform problem/project-based learning. Students will complete their own health risk assessments, as well as helping with health promotion activities and health risk communications to patients. Prerequisite: Permission of instructor is required. Credit: 2. Enrollment Max. 1. For information about the meeting time and location, please contact Ashley Bowes at 681-3066 or via email at ashley.bowes@duke.edu. *Sam Moon, MD; Brian Caveney MD/JD/MPH; and Carol Epling, MD/MSPH*

COMMFAM-221C. PRACTICAL CLINICAL NUTRITION. This course will cover the topics in clinical nutrition that will be of most use to medical students interested in primary care. Participants will have a chance to observe and practice interviewing and counseling skills. Topics will include weight management, eating disorders, diabetes, hypertension, cancer, pregnancy, middle age, elderly, and population-based nutrition. Credit: 2. Enrollment Max. 6. Location: Hanes House 302 - 9:00 a.m. Contact: Gwen Murphy, PhD, at gwen.murphy@duke.edu for permission. *Gwen Murphy, PhD* – NOT CURRENTLY OFFERED

COMMFAM-222C. PROSPECTIVE HEALTH PLANNING AND INTEGRATIVE MEDICINE. This selective will provide second year Duke Medical students an evidence-based and experiential exploration of Duke Integrative Medicine's "Wheel of Health" as one approach to prospective health planning. Methods include literature reviews, clinic visits with integrative medicine providers, practitioner and patient interviews, and participation in various ongoing activities at Integrative Medicine. Students will receive faculty mentoring, attend a few ongoing classes, receive orientation to informational resources, and experience Mindfulness-Based Stress Reduction and health coaching. Students set personal health goals, develop their own health plans, and give presentations about some aspect of Integrative Medicine. For more information, please contact the Course Director at baile010@mc.duke.edu, (919)660-6657. Prerequisite: Advance permission of the instructor is required. NOTE: Students may not drop this selective within one month of the first day of classes. Credit: 2. Enrollment: Minimum 2, Maximum 4. Course Director: *Michelle Bailey, MD*

COMMFAM-224C. PROCEDURAL SKILLS IN PRIMARY CARE - LUMPS AND BUMPS. Students will receive instruction and experience in office-based procedures common in primary care. This 2-week selective will consist of workshops, observation, and participation in procedures such as simple skin biopsies, arthrocentesis of major joints, trigger point injection, joint injections, colposcopy, etc. The didactic experience will include instruction and guided reading focusing on indications for procedures, informed consent, and post-procedure care. For more information and permission to enroll, please contact Ashley Bowes at 681-3066. NOTE: Students may not drop this selective one month prior to the course. Students must obtain permission to drop the course. Credit: 2. Enrollment Max. 4. *Gloria Trujillo, MD; and Priscilla Tu, DO* – NO LONGER OFFERED EFFECTIVE 2014-2015

COMMFAM-225C. TRAVEL MEDICINE AT DUKE STUDENT HEALTH. Health education, immunizations, and medications pertinent to the traveler compose a distinct area of medical knowledge that has not been otherwise addressed in the curriculum. The medical student taking this course will review the major infectious illnesses of concern for each travel area. They will be responsible for the medical knowledge base and patient education needs about the mode of transmission and typical presentation of these illnesses, available behavioral intervention prevention methods, available vaccine prevention, options of chemical prophylaxis, and treatment if prevention is not successful. Students cannot take 2-week selective and 4-week elective. Credit: 2. Enrollment max: 1. Contact: Ashley Bowes at ashley.bowes@duke.edu for permission. *Melanie Trost, MD*

Fourth Year Clinical Electives

COMMFAM-401C. SUBINTERNSHIP IN FAMILY MEDICINE. Sub internship in Family Medicine. This course provides senior medical students with an intense patient and population-oriented clinical rotation with responsibilities and autonomy similar to that of an intern. This clerkship will provide a unique opportunity to participate in the department's effort to test new models of care in the delivery of team-based chronic disease management in the ambulatory and community setting. Students will see patients in the same format as entering interns with a patient panel supervised by senior faculty at Duke Family Medicine Center. Each clerk will participate in a PDSA project in conjunction with the Population Health Improvement Leadership curriculum team. 40-50% of the rotation will be direct clinical care in the Duke Family Medicine Center. The remaining 50-60% will occur with the Duke Family Medicine Transition of Care Team and with the Population Health Management Resident and in participation in innovative group visits for diabetes and obstetrical care. The inpatient component will include rounding on Family Medicine patients admitted to Duke Hospital who have been identified as in need of transitional care. The student will provide communication of the patient's status with the primary provider and assist the extended care team in helping the patient making a smooth transition from inpatient to community based care. The sub-intern will be on call for pages when the DFMC resident is in the Duke ED and will be available to come in for evaluation of DFMC patients who are seen in the ER at least two nights per week. Clinical instruction and supervision on each patient encounter is provided by senior level house staff and faculty members of the Department of Community and Family Medicine. Students are advised to contact the department as early as possible for course approval (at least eight weeks in advance). No drops are permitted within 60 days of the first day of the rotation. Priority will be given to students with an interest in a career in primary care. For more information please contact the Coordinator of Medical Student Programs at 681-3066. Credit: 5. Enrollment: max 1 per session. *Joyce Copeland, MD, and Nancy Weigle, MD*

COMMFAM-410C. TRAVEL MEDICINE AT DUKE STUDENT HEALTH. Health education, immunizations, and medications pertinent to the traveler compose a distinct area of medical knowledge that has not otherwise been addressed in the curriculum. The medical student taking this course will review the major infectious illnesses of concern for each travel area. They will be responsible for the medical knowledge base and patient education needs about the mode of transmission and typical presentation of these illnesses, available behavioral intervention prevention methods, available vaccine prevention, options of chemical prophylaxis, and treatment if prevention is not successful. Students that took this course as a 2 week selective cannot take this course as a four-week elective. Enrollment max: 1. Credit: 2. Contact: the Coordinator of Medical Student Programs at 919-681-3066 for permission. Please Note: 8:30am will be the start time unless otherwise instructed by Dr. Trost and you will need to meet at the Student Health Center, Duke South. *Melanie Trost, MD*

COMMFAM-423C. OCCUPATIONAL AND ENVIRONMENTAL MEDICINE. This elective is designed to enhance the student's skills in several important areas related to occupational medicine: occupational injury and illness prevention, epidemiology, health management for employee populations, industrial toxicology, worksite wellness, and prevention programs. During this four week rotation, students will complete readings related to these areas, observe surveillance exams and prospective health planning visits, participate in lectures and seminars, learn to conduct computerized database searches concerning industrial toxicology, and (as available) visit industrial sites. Students will also complete at least one project involving one of the topics above. Upon completion of the rotation, students can expect to have practical and useful skills applicable to occupational medicine and worksite health programs. Credit: 4. Two months advance notice and permission from instructor is required. Enrollment: max 1 per month. All interested students should contact the Coordinator of Medical Student Programs at 681-3066. *Carol Epling, MD; Dennis Darcey, MD; and Sam Moon, MD*

COMMFAM-432C. INTEGRATIVE MEDICINE AND PROSPECTIVE HEALTH. This four week elective provides an evidenced-based didactic and experiential exploration of integrative medicine from the Duke Integrative Medicine perspective. The core focus is on key overlaps between patient-centeredness, prevention, mindfulness, health behaviors, long-range health planning, patient empowerment, and complementary and integrative medicine health practices. This four-week elective provides an evidenced-based didactic and experiential exploration of the value of integrative medicine and prospective health. The core focus is on key overlaps between patient-centeredness, prevention, mindfulness, health behaviors, long-range health planning, patient empowerment, and complementary medicine practices. Students may engage in a variety of clinical and educational activities including personal health risk assessment, integrative health coaching, weekly mindfulness classes, monthly case conference, and participation in clinic activities with practicing physicians and complementary medicine providers at Duke Integrative Medicine

and in the community. Credentialing, training requirements, and health care systems issues are discussed, as well as possible risks, hazards, and inefficiencies relating to complementary practices. Students set personal health goals, develop their own health plans, and receive coaching during the course to gain a better understanding of an integrative medicine model. A reflective writing on the student's experience is required and due at the end of the course. All interested students should contact the Course Director at michelle.bailey@duke.edu. This course will only be offered during the spring term, Section 42. Prerequisites: Advance permission of the instructor is required. Credit: 4. Enrollment: Minimum 2, Maximum 4. Course Director: *Michelle Bailey, MD* - NOT CURRENTLY OFFERED

COMMFAM-433C. COMMUNITY HEALTH. This elective introduces students to the concepts and practice of community and population-based health care. Population-based care is becoming increasingly important in addressing the health needs of the United States. This elective helps students understand how Duke University Health System serves communities through collaborative, innovative, interdisciplinary clinical services, educational programs, and applied research. By allowing students to participate in actual programs, role modeling and experiential learning are used to supplement and apply what is learned in the required text-based materials of the course. Because the specific course activities depend upon the student's particular interests and the community health activities ongoing at the time of the elective, each student's experience will be individually designed. Participation in this course requires instructor permission. Students must contact Dr. Anh Tran, Program Director, at least six weeks prior to the start of the course via email at anh.tran@duke.edu. At that time, Dr. Tran and the student, along with community programming faculty and staff, will plan the specific activities that will be undertaken by that student, and establish the requirements for the student's successful completion of the course. For more specific information about the course, students may contact Claudia J. Graham, MBA, MPH (claudia.graham@duke.edu), Training Coordinator in the Division of Community Health, at 919-681-5724. Details on course meeting location, days and time will be communicated prior to the first day of class. Credit: 4; Enrollment max: 1. *Anh Tran, PhD, MPH*

COMMFAM-435C. HEALTH PROMOTION AND DISEASE PREVENTION. This elective is an intensive clinical experience in health promotion and disease prevention. Students see patients in the Duke Family Medicine Center, Duke Affiliated Programs, and Duke Community Health Programs. They will participate in a variety of activities designed to help them provide excellent health maintenance care. Specific content areas addressed include risk assessment, counseling skills in nutrition, safe sex practices, and smoking and alcohol cessation, as well as screening tests and immunizations. Students will be introduced to the practical implementation of preventative care in the clinical and community setting. Prerequisite: permission of instructor and completion of Family Medicine Clerkship (Commfam 205C). Two months advance notice. All interested students should contact the Coordinator of Medical Student Programs, Ashley Bowes, at 681-3066 or ashley.bowes@duke.edu. Credit: 4. Enrollment: min 1, max 4. *Joyce Copeland, MD and Nancy Weigle, MD*

COMMFAM-441C. FAMILY MEDICINE CONTINUITY EXPERIENCE. Students manage a panel of patients over an extended period of time at the Duke Family Medicine Center under the supervision of one family physician faculty member. Patient care is scheduled for one to two half-days a week for two to four months. The rotation may be repeated to provide further continuity. With permission, this course can be audited; a project is required for course credit. Due to the need for clinic schedule arrangements, students are advised to contact the department as soon as possible for course approval (at least eight weeks in advance). Priority will be given to students in the Primary Care Program. Prerequisite: permission of instructor. For more information, please contact the Coordinator of Medical Student Programs at 681-3066 or ashley.bowes@duke.edu. Credit: 4. Enrollment max., 1. *Joyce Copeland, MD, Nancy Weigle, MD and staff*

COMMFAM-448C. INTRODUCTION TO MEDICAL INFORMATICS. This elective provides students with an opportunity to explore the integration of medicine and information technologies in an experiential manner by working on an ongoing or self-initiated medical IT project. In doing so, students will gain an understanding of the field of clinical informatics and the role it plays in the national effort to improve quality of care and eliminate medical errors. Additionally, topics students will explore include: Electronic medical systems (e.g. EHR, PHR, CPOE, eRx, CDS); Role of health IT in patient safety; Health information standardization (e.g. HL7); and Medical Information Terminologies/Taxonomies (e.g. SNOMED). Permission of the instructor is required. For more information about the course, students should contact the Duke Center for Health Informatics, Vivian West, PhD via email at vivian.west@duke.edu, or by phone, 919-668-0189. Enrollment: 4 (currently offered during section 41 only of spring, but under review). Credit: 4. *Ed Hammond, PhD*

COMMFAM-449C. COMMUNITY AND FAMILY MEDICINE PRECEPTORSHIP. An individually tailored preceptorship which allows students to observe and participate in aspects of the broad scope of Community and Family Medicine, including delivery of care to individuals, families, and populations within the context of the community in which they live. The rotation supplements and complements the second-year core clerkship, and allows the student further exploration of specific areas of interest. A wide variety of practice types and geographic locations are available; students may choose from an extensive list or nominate a new site. Opportunities are also available within the Duke system, including: Lifestyle Management. All interested students should contact the Coordinator of Medical Student Programs at 681-3066 or ashley.bowes@duke.edu to arrange a rotation in their area of interest. Because of the necessity for site approval and prior arrangements with preceptors, it is essential that this contact be made as soon as possible, and at least six months prior to the desired rotation. Drops are not accepted. Prerequisites: permission of instructor. Enrollment max. 1. Credit: 4. *Joyce Copeland, M, Nancy Weigle, MD and staff*

Dermatology

Russell P. Hall, III, MD
Chair, Department of Dermatology
Campus Box 3135
Phone: (919) 684-3110; Fax: (919) 684-3002
E-mail: hall0009@mc.duke.edu
Assistant: Brandy Mitchell
Business Manager: Virginia King-Barker
Department/Faculty Information: <http://dukederm.duke.edu/>

Second Year Two-Week Clinical Electives

DERMATOL-220C. INTRODUCTION TO DERMATOLOGY. The dermatology selective is a two week introduction to dermatology. Each student's schedule will be individualized to reflect the student's interests (eg. surgery or pediatrics) and will include time in the outpatient clinics and inpatient dermatology consults. A study course is provided that includes on-line modules as well as textbook readings. Students will be given the opportunity to identify a mentor and/or opportunities for research. Permission of the course instructor is required. Credits: 2. Enrollment Max: 1, unless otherwise noted. *Caroline Rao, MD*

Fourth Year Clinical Electives

DERMATOL-450C. CLINICAL DERMATOLOGY. The elective in clinical dermatology is designed to prepare students to perform an accurate skin examination, formulate appropriate differential diagnoses, and choose relevant diagnostic or therapeutic interventions. This course is valuable to any student interested in improving their ability and confidence in the cutaneous exam. Students in the rotation spend two weeks working in the outpatient dermatology clinics, one week on the inpatient consult service at Duke, and one week at the Durham VA Medical Center. The outpatient clinical experience includes general dermatology clinics as well as a variety of specialty clinics such as pediatric dermatology, HIV dermatology, cutaneous oncology; clinic attendance can be tailored to the student's future career goals. Patient care is supplemented with lectures designed to provide the student with a foundation in dermatologic principles, and students are encouraged to attend weekly departmental teaching conferences. Student evaluations are based on the development of clinical skills as assessed by faculty and residents, and by a brief clinically oriented examination. Students are to report to the Dermatology Clinic, VA medical center Room C8013 on 8:30 a.m. on the first day of the rotation for orientation. Dr. Caroline Rao is the course director and may be reached at 681-3590 or 970-9601. Secondary Contact: Sharon Johann, sharon.johann@duke.edu or 919-6973. Credit: 4. Enrollment: max. 3, except where otherwise indicated. Sole Enrollment. Students may not enroll in any other daytime courses while enrolled in this course. *Caroline Rao, MD, Russell Hall, MD, Sarah Myers, MD, Navjeet Sidhu-Malik, MD, John Murray, MD, and other staff*

Free Time

FREETIME-450C. FREE TIME. Students with no classes scheduled for a particular section must sign up for free time.

Interdisciplinary

Required Courses

INTERDIS-100B. MOLECULES, CELLS & TISSUES. A course designed for first year medical students that focuses on the molecular and cellular principles of human biology. The course has five components, which are tightly integrated: biochemistry, cell biology, genetics, histology laboratory, and a series of clinical correlations. The biochemistry component emphasizes the relationship between structure and function of the major classes of macromolecules in living systems including proteins, carbohydrates, lipids, and nucleic acids. The metabolic interrelationships and control mechanisms are discussed as well as the biochemical basis of human diseases. The cell biology component emphasizes the structure and function of the cells and tissues of the body. The histology laboratory provides practical experience using virtual light microscopy to study and analyze an extensive slide collection of mammalian tissues. The genetics component emphasizes molecular aspects of the human genome, the structure of complex genes, regulation of gene expression, experimental systems for genetic analysis, human genetics, including population genetics and genetic epidemiology, the use of genetic analysis for the identification of disease causing genes, cytogenetics, cancer genetics, and genetic diagnosis and counseling. The series of clinical correlations links the material covered in the basic science lectures to clinical problems. Many of the correlations include an interview with a patient. Credit: 6. Enrollment: max 115. *Thomas McIntosh, Ph.D.; Richard Brennan, Ph.D.; Jennifer Carbrey, Ph.D.; Jonathan Cohn, M.D.; and staff*

INTERDIS-101B. NORMAL BODY. This core course of the preclinical curriculum is intended to present the scientific principles underlying the structure and function of the normal body, thereby providing the foundational knowledge for the practice of medicine and facilitating the incorporation of the new scientific knowledge throughout the medical career. To accomplish this end, the goals of the Normal Body component are to ensure that all students possess a conceptual model of the structure and integrated function of the human body (as an intact organism) and each of its major organ systems, emphasizing their role in the maintenance of the body's homeostasis. Credit: 12. *Thomas McIntosh, PhD and staff*

INTERDIS-102B. BODY AND DISEASE. This core course in human disease is presented from February through June of the first year. The course begins with fundamental principles of the four basic sciences most directly related to human disease: immunology, microbiology, pathology, and pharmacology. This segment comprises the first seven weeks and also includes discussion of disease classes not related specifically to any one organ system, including cancer, immunodeficiency diseases, and chemically-induced diseases. The remaining thirteen weeks are devoted to an integrated presentation of the most common human diseases organized sequentially by organ system. Teaching modes include lectures, a variety of small group activities guided by faculty, clinically-oriented disease workshops, and team-based learning. Credit: 20. Meeting Location for First Day of Classes: Duke South Amphitheater. *Victor Nadler, PhD; Alejandro Aballay, PhD; Christine Huette, MD, Jack Keene, PhD, Garnett Kelsoe, D.SC, and Linton Yee, MD.*

INTERDIS-103B. BRAIN AND BEHAVIOR. The goal of Brain and Behavior is to present the scientific principles underlying the structure and function of the human nervous system as well as their dysfunction in certain neurological disorders. This course thus provides foundational knowledge for the practice of medicine and will facilitate the incorporation of new scientific knowledge throughout the medical career. Additionally, topics in normal and disordered human behavior will be incorporated into the curriculum to promote initial awareness of their anatomical and physiological substrates. Core material is presented through a synergistic combination of didactic lectures, scientific readings, laboratory exercises, and clinical case problem-solving. Credit: 4. *Leonard White, PhD, and D. Corey Adamson, MD*

INTERDIS-104B. INTRODUCTION TO PREVENTION. This interprofessional course uses a team-based learning approach to develop appreciation of the unique contributions of various health care providers in providing best practice prevention care to populations. Web-based modules on cultural competence, health literacy, and community health are also used. Interprofessional student teams meet in lecture and small group settings for organized activities and community assignments. A final team project is required. For more information please contact Kate Holeman via email at kate.holeman@duke.edu (919-681-9864). Enrollment: 300. Credit: 1. *Kimberly Hawblitzel Yarnall, MD*

INTERDIS-105B. PRACTICE YEAR 1. The Practice courses are required in years one, two, and three. Practice emphasizes clinical skills development using lecture and small group teaching, and outpatient clinical work. In year one, Practice introduces students to interviewing and physical diagnosis skills with emphasis on the doctor/patient

relationship. Practice uses written assignments, problem-based learning, video-taping, group discussion to meet course goals. Students practice interviewing and counseling on the wards and with standardized patients. In the spring of year 1, students work with preceptors in outpatient clinics and on the wards to practice their new skills. Credits: 3. *Nancy Weigle, MD*

INTERDIS-203C. CLINICAL SKILLS ASSESSMENT. Assessment Week is an opportunity for students to demonstrate competency in clinical skill areas, and to gain insight into basic and clinical science areas needing additional development. Faculty also use data from the week to evaluate the effectiveness of clinical curriculum. During Assessment Week, students complete an eight-station clinical performance examination (CPX) with standardized patients. The CPX is fashioned after the USMLE Step 2CS exam in order to help students prepare for this licensing exam. Students are assessed on their ability to read electrocardiograms and x-rays, and to interpret lab results. At the end of the week, clinicians review the correct answers for each of these components with the students. Students complete the Comprehensive Basic Science Examination in preparation for the USMLE Step 1 licensing exam, and take an information management skills assessment. Assessment Week also allows time for reflection. Students participate in a half-day retreat with the advisory deans to consider the education impact of the second year curriculum and provide feedback. Students who do not achieve a passing score on each component of Assessment Week must successfully remediate the component. Students must pass each component of the week before beginning the 4th year. Credit: 1. *Deborah Engle, EdD*

INTERDIS-204C. CLINICAL SKILLS COURSE. The Clinical Skills Course is a longitudinal assist medical student in patient care by providing a foundation of clinical skills that complement and expand upon those taught during the required clerkships. The initial focus will be on history and physical examination skills to generate a differential diagnosis. Procedural skills, including arterial blood gas sampling, nasogastric tube insertion, and intravenous line start will be taught using simulated models. Basic principles of patient safety including handoffs, medication safety, medical error reporting, and root cause analysis will be emphasized. Interpretation and characteristics of diagnostic tests, including electrocardiograms and laboratory studies, will be taught. Advanced clinical reasoning skills and evidence-based medicine will conclude the course. Both large-group lectures and small-group sessions with applied practice will be used to instruct students. Credits: Fall Term 4, Spring Term 1. Course Director: *Saamil Chudgar, MD and staff*

INTERDIS-205C. PRACTICE YEAR 2. During year two, students use the Practice course to reflect on their experiences on the clinical rotations. Discussion topics include ethics, suffering, spirituality, pain, professionalism, and end of life issues. Credit: 2. *Nancy Weigle, MD*

INTERDIS-305C. PRACTICE YEAR 3. A continuity ambulatory (outpatient) care experience, the course is required of third year students and is designed to teach students patient outcomes over time. Study away and scholarship students who may not be able to take the course in their third year must take its equivalent in their fourth year. However, you can take the course at your location with the following identified: what contact you will have with patients, the type of patients, and the length of time you spend with patients. The outpatient clinic experience is 34 weeks, one-half day a week. Twenty-two weeks are required in an approved continuity ambulatory site, primary care sites being the most likely to be approved. Specialty care sites (medicine or surgery) may be approved, if at least 50 percent of the patients are seen on a continuing basis with typical follow-up in 1-3 months for the 22 weeks. Approval for this is required by the Practice Course Director. Students may arrange to use 12 of the 34 weeks to pursue non-continuity outpatient clinic experiences (e.g., specialty clinics that do not see patients back before three months, if at all). Notification of the Third Year Coordinator is required prior to starting, and attendance must be documented by the preceptor. A student may choose to do all 34 weeks at the same approved site. Credit: 3.0. Enrollment: max 120. *Nancy Weigle, MD*

INTERDIS-314B. MEDICAL STATISTICS. The Medical Statistics course covers in-depth statistical concepts that will be used by students during their third-year research project. Students must complete the on-line Medical Statistics course between the fall start date of third year and March 31st of the following spring term. Credit: 0.5. Enrollment: max 100. *Sandra Stinnett, DPH*

INTERDIS-401C. ACUTE CARE CURRICULUM. Critical Care is not limited by location and focuses on the care of patients with acute life-threatening illnesses. Every practitioner needs the ability and fundamental knowledge to quickly recognize and initiate appropriate, timely management which can prevent further patient deterioration and end-organ damage. Multidisciplinary care depends on respect and communication for the best outcomes. The cost of

health care continues to grow and much of it is spent in the intensive care setting, often in the last months of life. The use of technology must be tempered with sound judgment and quality versus quantity must be addressed. Primary Contact Dr. Nancy Knudsen, Secondary Contact Anne Bowman. Enrollment Max: 18 Min: 4. *Nancy Knudsen, MD*

INTERDIS-450C. CAPSTONE. This mandatory course for all fourth year medical students will provide important information and tools to prepare medical students for their first year of residency. Topics will address such issues as compassionate, appropriate, and effective patient care: medical knowledge about established and evolving biomedical clinical and cognate sciences as well as practical tips for when you are "on-call" as an intern; interpersonal and communication skills that result in effective information exchange and teaming with patients, their families, and other health professionals; professionalism relative to responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population and systems-based practices that demonstrate one's awareness of and responsiveness to the larger context and system of health care. As part of this course, medical students will participate in a BLS and ACLS provider course. For more information, students should contact Dr. Alison Clay via email at alison.clay@duke.edu. Secondary contact: Saamil Chudgar, MD. Credit: 4. Enrollment Max. 110. *Alison Clay, MD*

Required PCLT Courses

INTERDIS-207C. PRIMARY CARE LEADERSHIP TRACK (PCLT). The Longitudinal Integrated Clerkships will produce physicians with knowledge of the health care system, understanding of longitudinal chronic illness care, and skills to work effectively in teams to care for patients and improve systems of care. *Barbara Sheline, MD*

INTERDIS-208C. PRIMARY CARE SEMINAR. This small group tutorial will cover patient care in a holistic manner from the complete care of the patient to understanding the clinical and basic science behind disease processes. Emphasis will be focused on looking at an illness from the patient's perspective with treatment plans that consider social and cultural issues, community resources, cost effectiveness, and health care systems issues such as transitional care between different sites. Students will consider the various different roles of the primary care provider in the care of patients. Students will also reflect on their experiences within the different longitudinal clinical learning sites and offer ongoing feedback to the program. *Barbara Sheline, MD and Bruce Peyser, MD*

Basic Science Electives

INTERDIS-110B. GLOBAL HEALTH. This unique course brings together some of the outstanding professors from across Schools and Departments at Duke University to address issues of Global Health. The course is designed to provide students with multidisciplinary theories and techniques for assessing and addressing infectious, chronic, and behavioral health problems in less wealthy areas of the world. The course will address global health issues from the disciplines of: epidemiology; biology; medicine; nursing; law; ethics; policy; psychology; sociology; anthropology; environment; engineering; that represent major disease burden overview of public health, focusing on the prevention of diseases and health problems. After a brief review of public health history and epidemiologic methods, we will discuss organizational structures and their roles in defining, preventing and managing public health problems. We will explore selected health problems or issues from a health services research perspective, and discuss their health policy implications. C-L PUBPOL 264.01 Credit: 0. *Kathryn Whetten, PhD*

INTERDIS-155B. MEDICAL SPANISH I. The Medical Spanish Elective (MSE) offers 1-2 hours per week of medical Spanish language classes to first year Duke Med students. Students are stratified based on incoming language level. In addition, course participants are expected to volunteer for a minimum of 10 hours in the Latino community in the local area. A notation of completion is added to the student's transcript, upon successful completion of all requirements. There is no notation if requirements are not met. Students are assessed a \$75 enrollment fee. The fee may only be waived if the student elects to drop the course prior to the start of the second session of the term. Students must email Dr. Dennis Clements (dennis.clements@duke.edu) for permission to be dropped prior to the second session. No credit: *Dennis Clements, MD/PhD*

INTERDIS-156B. MEDICAL SPANISH II. The Medical Spanish Elective (MSE) offers 1-2 hours per week of medical Spanish language on-line classes with Interlangua to first year Duke Med students. Students are stratified based on incoming language level. In addition, course participants are expected to volunteer for a minimum of 10 hours in the Latino community in the local area. A notation of completion is added to the student's transcript upon successful completion of the requirements. There is no notation for those that do not complete the requirements. There is a \$75 enrollment fee for all enrolled students. The fee may only be waived if the student requests to be

dropped from the course prior to the second session of the term. Approval is required from Dr. Dennis Clements (dennis.clements@duke.edu). No credit: *Dennis Clements, MD/PbD*

INTERDIS-160B. MEDICAL CHINESE. Medical Chinese is an exciting new elective offered by the medical school for both beginners and intermediate/advanced speakers who wish to develop their Mandarin skills. The course was created in part by the recognition of the language's 20% of the world's population. Within the United States itself, it is the 3rd most spoken language. Chinese is an official working language of the United Nations and WHO. About 4-5% of the population in Durham County is of Asian descent. The presence of Chinese-speaking individuals has become increasingly evident on Duke's campus as well as in the clinics and hospitals. Not only do we have Chinese physician, doctorate fellows, and researcher scientists working with us side-by-side, but we also provide care to many Chinese who may not speak English. As with many other languages, the ability to communicate in Mandarin would be a valuable asset to all health care providers. The ultimate goal of the Medical Chinese Elective is to enable us to assist in medical interpretation and to help us develop a stronger rapport with our Mandarin-speaking patient. No Credit.

INTERDIS-209C. PRIMARY CARE LEADERSHIP TRACK (PCLT) COMMUNITY TEAM. In this course, students function as active members of existing community teams addressing health care needs of Durham residents. The activities will depend on the patient's needs and the needs of their team. Students will be assigned patients to work with to help them understand their disease, the treatment plan, and the health care system. Students will visit patients in their homes, as well as accompany them to provider visits as necessary. *Michele Lyn, MD – NOT CURRENTLY OFFERED*

Fourth Year Clinical Electives

INTERDIS-400C. INDEPENDENT STUDY. Independent Study is a four-week term-based, non-credit bearing enrollment status used when the student is engaged in medical education-related activity that is relevant to the degree (e.g. structured USMLE preparation, medical volunteerism, internship at organization related to training) but is not research. An application consisting of a brief description of the activity and advisory dean approval is required of fourth year students. A brief report to the advisory dean on the progress of the activity is required at the end of each four-week section. The Independent Study option for third year students is included on the 3rd year registration form for those students taking the board preparation course. The four-week study period must be approved in advance by the student's third year mentor, study program director, and mentor. The four week period for study time is not guaranteed. Students enrolled in Independent Study are eligible for benefits of insurance, but are not eligible for financial aid for living expenses. Completion of the Independent Study form and permission of advisory dean is required in order to be enrolled. Approved enrollments will be processed by the Registrar's Office upon receipt of the completed Independent Study form.

INTERDIS-402C. HISTORY OF MEDICINE FOR CLINICIANS

INTERDIS-422C. EXPLORING MEDICINE: CROSS-CULTURAL CHALLENGES TO MEDICINE IN THE 21ST CENTURY. The purpose of this course is to promote understanding the cultural background of the people of Latin America (particularly Honduras) and how that impacts the delivery of medical care. The course content is designed to facilitate understanding how art, history, literature, music, geography, ethics and religion influence the practice of medicine in the Latin American Culture. The Classes will be given by multidisciplinary faculty from Duke, Johns Hopkins and local experts. Medical Spanish instruction is included in each class to facilitate understanding the culture and facilitate encounters with Hispanic patients in our own environments as well as in Honduras. The course will be held as a 2 hour seminar for 10 weeks (begins in early January) with the trip to Honduras as an optional laboratory experience. There will be 20 hours of instruction. For more information, please contact Dr. Clements at 684-7790 or via email at Dennis.Clements@duke.edu. Secondary contact: Rosa.Solorzano@dm.duke.edu. Students meet for the first day of classes in the School of Nursing Amphitheater the first Tuesday of the Spring Semester at 6:00 p.m. The course is a fourth year elective that was approved, effective spring 2013, for third year and first year medical students. Credit: 1 Enrollment - up to 30 students. *Dennis Clements, MD/PbD*

INTERDIS-423C. HONDURAS TRIP. A 10 day trip to Honduras is planned to begin the end of March with approximately 15 students invited. Interdis 422C is a prerequisite for this trip. A certain number of students with Spanish fluency are needed for the trip. Those traveling to Honduras will visit a local Honduran hospital and

additionally provide medical care to patients during 6 days of the trip. Part of that time will be spent in a clinic built with funds raised by Duke students. A trip to Copan and an indigenous Mayan community is also planned. Permission of the instructor is required for the trip. For more information and permission, please contact Dr. Clements at 684-7790 or via email at Dennis.Clements@duke.edu. Secondary contact: Rosa Solorzano, Rosa.Solorzano@dm.duke.edu. Fourth year medical students that plan to take the course must obtain prior approval of the course director of the Capstone course in order to participate. This fourth year elective has also been approved to be taken by third and first year medical students, effective Spring 2013. However, third year students MUST obtain permission from their mentor (Prior to the trip) to be away for 10 days. First year students must obtain permission as well or use their vacation time. **ORIENTATION AND SELECTION FOR THIS TRIP TAKES PLACE IN OCTOBER THROUGH A SEPARATE EMAIL REQUEST.** Credit 1. Enrollment up to 15. Instructor - *Dennis Clements, MD/PhD*

INTERDIS-470C. MSTP CLINICAL RESEARCH EXPERIENCE. Clinical research experience for MSTP student's only. 4 weeks. 0 credit.

INTERDIS-475C. CLINICAL EXPERIENCE. This course is designed for students that elect to explore clinical experiences while enrolled in other programs such as the MST program and other degrees. This course is for students that wish to refresh their clinical skills in a patient setting. 4 weeks. No credit. *Staff*

Medicine

Mary E. Klotman, MD

Professor of Medicine and Infectious Diseases

Office: 1102 Duke North

Campus Box 3703

Phone: (919) 668-1755; Fax: (919) 681-5400

Assistant: Donna Salvo

Business Manager: Joe Doty, Vice Chair for Administration

Department/Faculty Information: <http://medicine.duke.edu/>

Required Courses

MEDICINE-205C. MEDICINE (DUKE/DUKE REGIONAL/VAMC). During the second year clerkship in medicine, students each will be assigned two four-week blocks to a team taking care of patients on the Internal Medicine Wards at Duke Hospital, Duke Regional Hospital or the Durham Veterans Administration Hospital. The Internal Medicine Clerkship is an opportunity for the student to consolidate knowledge from the first year and apply it to the study of his or her "own" patients. Functioning within teams consisting of an intern, a resident, and an attending allows students to observe, practice, acquire, and refine basic humanistic and clinical skills while acquiring some of the factual information used in the practice of medicine. Since it is not possible to systematically cover the vast body knowledge comprising Internal Medicine during an eight-week rotation, students are assigned patients to evaluate and follow; these patients become representative learning experiences in a case-study model. Goals of the Medicine clerkship are to teach a method of patient evaluation and care and to provide a firm foundation in medical problem-solving that will be helpful throughout the student's future career. Specifically, students are expected to: (1) Perform and record a complete history and physical examination on each patient they admit. (During the first four weeks, this should be a minimum of two patients per week; thereafter, at least three patients per week). (2) Discuss their plan(s) for the evaluation and care of the patient after the resident has also assessed the patient, with both returning to the bedside to resolve any discrepant historical or physical examination findings. (3) Place a complete written work-up including analysis of primary data (e.g. peripheral blood smear, urinalysis, sputum gram stain, ECG, etc.) on the chart by 8:00 a.m. the next day. It is important during the clerkship to learn to evaluate primary data in a timely fashion. (4) Take primary responsibility for the care of their patients, following them daily, writing progress notes in the chart, keeping track of what has happened to their patients since last seen, and having a good understanding of the rationale for and outcomes of all diagnostic tests and therapeutic interventions. (5) Participate in various diagnostic/therapeutic procedures (e.g., phlebotomy, lumbar puncture, thoracentesis, paracentesis, arthrocentesis, arterial blood gas drawing, placement of intravenous lines) and perform these procedures under appropriate supervision. (6) Pre-round, or see each of their patients on a daily basis before morning work rounds, review what has happened since last seen, formulate a preliminary plan of care and treatment for each patient and then present these formulations to their ward teams during morning work rounds. (7) Prepare for their bedside case presentations by

reading, at a minimum, relevant sections in a standard textbook of medicine. (8) Present their patients to an attending physician within 24 hours of admission, knowing all pertinent medical information as well as the rationale for their ongoing plan(s) for care and evaluation. (9) Not miss any attending rounds without prior permission from their attending physician. (10) Attend all Chair's Conferences, Physical Diagnosis Teaching Rounds, Medical Grand Rounds, and the Student Lecture Series, and other site-assigned teaching activities/conferences unless urgent ward duties preclude doing so. Methods of evaluation: During week four and week eight, a grading committee composed of the resident(s) and the attending physician(s) with whom the student has worked, the Chief/Assistant Chief Medical Resident and the Course Director meet and evaluate each student based on the standard course evaluation form, a copy of which is posted on the Blackboard website and is distributed to each student during the initial orientation to the clerkship. At the end of the clerkship, students will take the NBME Medicine Clerkship written exam and a practical exam on focused problems using four standardized patients (mini-CPX exam). The final grade is a weighted average of the mid-term and end of clerkship grading sessions (80%), the NBME written exam (10%) and the mini CPX exam (10%). Weight: 8. *Saumil Chudgar, MD and staff*

MEDICINE-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT) - MEDICINE. During the second year clerkship in medicine, students each will be assigned one four-week blocks to a team taking care of patients on the Internal Medicine Wards and the longitudinal outpatient clerkship. The Internal Medicine Clerkship is an opportunity for the student to consolidate knowledge from the first year and apply it to the study of his or her "own" patients. Functioning within teams consisting of an intern, a resident, and an attending allows students to observe, practice, acquire, and refine basic humanistic and clinical skills while acquiring some of the factual information used in the practice of medicine. Since it is not possible to systematically cover the vast body knowledge comprising Internal Medicine during a four-week rotation, students are assigned patients to evaluate and follow; these patients become representative learning experiences in a case-study model. Goals of the Medicine clerkship are to teach a method of patient evaluation and care and to provide a firm foundation in medical problem-solving that will be helpful throughout the student's future career. The final grade is calculated based on weighted evaluations from all attendings and residents the students work with (80%) and end of course examinations (20%). Weight: 8. *Saumil Chudgar, MD, Anna Lisa Crowley, MD, and staff*

Second Year, Two-Week Selectives

A TASTE OF PALLIATIVE CARE. Palliative care focuses on helping patients and their families achieve the best quality of life, regardless of the length of life. Attention to suffering, excellent symptom management, and compassionate communication skills are paramount. Students will have the opportunity to observe and work alongside various palliative care practitioners in community, inpatient, outpatient and hospice settings. The importance of multi-disciplinary teamwork will be emphasized. Concepts to be explored include common fears and challenges that terminally ill people face, biopsychosocial models of care, palliative care symptom management, the family interface, grief, and bereavement. Students will be notified via email with information concerning where students are to report on the first day of classes. Secondary contacts: Sheila Juhans (sheila.juhans@duke.edu) and William English (william.english2@duke.edu), or 919-668-7215. Credit: 2. Enrollment Max. 1. Location: Duke University Hospital, Duke Regional Hospital, Duke Home Care & Hospice. Primary Contact: *Jason A. Webb, MD (jason.webb@duke.edu)*

MEDICINE-223C. GASTROENTEROLOGY SELECTIVE. In order to expose students to the field of Gastroenterology, students will rotate on two services. Students will spend one week on the Gastroenterology Consult Service at Duke Hospital or at the Durham VA Medical Center. On these services, students will perform inpatient consults and be able to see a variety of general gastroenterology procedures. Students will also spend one week on the Biliary Service and/or Hepatology service at Duke. Students will see patients with biliary disorders and be able to see ERCP and endoscopic ultrasound procedures. Credit: 2. Enrollment Max. 2. Location: Duke S. Endo Unit (Clinic 2H) Tyor Conference Room in GI suite (Ground level, Orange Zone) -Promptly at 8:00 a.m. For more information, please contact Jill Rimmer, 684-2819 or via email at jill.rimmer@duke.edu. *Melissa Garrett, MD; Andrew Muir, MD and Staff*

MEDICINE-225C. INTRODUCTION TO HOSPITAL MEDICINE. The student on the Hospital Medicine selective will help manage acutely ill patients as a member of the Hospital Medicine Service. Four major learning areas will be emphasized. 1) General Medicine consultations for management of hypertension, tachycardia, delirium, diabetes, hypoxia, perioperative risk assessment. 2) Procedures including thoracentesis, paracentesis, and lumbar puncture through direct observation, simulation, and viewing of procedure videos. 3) Inpatient care working directly

with a Hospital Medicine attending. 4) Late evening and overnight patient care with Hospital Medicine attendings with the opportunity to participate in patient admissions, cross cover emergencies, and transitions of care. Credit: 2. Enrollment Max: 1. Prerequisite: MED2 205C (Medicine Clerkship). Permission of the course director is required: *Saumil Chudgar, MD*

MEDICINE-229C. ADULT NEPHROLOGY. This selective course will provide the learner with the opportunity to experience the practice of nephrology in a variety of clinical settings. This course will allow the student to learn inpatient consultative nephrology by joining the inpatient acute nephrology service. The student will be expected to see a new consult, perform a focused history and physical, and determine the assessment and plan with the help of the fellow and attending on the service. The course will also include outpatient opportunities such as nephrology consultation clinic, home hemodialysis clinic, and outpatient dialysis rounds. Students report to Duke North Dialysis Unit 7800 on first day of class. Credits: 2. Enrollment Max: 2. *Ruediger Lebrich, MD.*

Clinical Science Electives

MEDICINE-226C. INTRODUCTION TO ENDOCRINOLOGY. This selective serves as a general introduction to Endocrinology. The student on the Endocrinology Selective will help manage both acutely ill patients on our inpatient consultative service the first week and then follow patients in our clinics on an outpatient basis the second week. Learning areas emphasized include: 1) diabetes care including a) acute management; b) long term management; c) medication use and familiarity, especially insulin; 2) general thyroid disease and 3) exposure to metabolic bone disease, lipidology, adrenal diseases and pituitary diseases. Class meets Monday thru Friday 8am-5pm. Meeting location for first day: Student should meet Dr. Hong at Clinic 1A for orientation on Monday, first day of rotation at 8am. Credit: 2. Enrollment Max: 1. *Beatrice Hong, MD and Susan Spratt, MD*

MEDICINE-227C. INTRODUCTION TO CONSULTATIVE CARDIOLOGY. Student will work as a member of the consultative cardiology team at either Duke or the VA and will have the opportunities to participate in some of the following: EKG/rhythm strip reading, stress testing, echocardiography, cardioversion, cardiac catheterization, pacemaker placement and overall care of inpatients with cardiac disease. Secondary Contact: Dawne Smith via email, dawne.t.smith@duke.edu. Pre-requisite: Students must have successfully completed Medicine 205C prior to taking this selective offering. Permission of instructor required. For more information or a permission number, please contact Dawne Smith via email, dawne.t.smith@duke.edu. Credit: 2. Enrollment: max 1. *Anna Lisa Crowley, MD*

MEDICINE-228C. INTRODUCTION TO MEDICINE-GERIATRICS. As the aging population continues to grow, Geriatrics is a field of medicine vital for all students in pursuit of any medical or surgical specialties to gain experience in. Students will practice geriatric assessment skills (i.e., cognitive, mobility, and functional assessment) hands-on with a senior mentor partner and in the Geriatric Evaluation and Treatment (GET) clinic. Students will explore different health care settings that older adults encounter, including inpatient, outpatient, and long term care settings. In addition, students will have didactics on core Geriatrics topics throughout the experience. Credit: 2. Enrollment Max: 4 Min: 1. *Jack Twersky, MD; Mitch Heflin, MD, MHS; Michele Burgess, MCRP (Geriatrics selective program coordinator); Gwendolen Bubr, MD, MHS, CMD, MEd; Jeanette Stein, MD; Heidi White, MD, MHS, CMD, MEd; Mamata Yanamadala, MBBS*

Fourth Year Clinical Electives

INTERNAL MEDICINE SUBINTERNSHIP (DUKE/VA). Course Goals: To provide an internal medicine inpatient care experience at the intern level. (2) How Goals Are Achieved: Students are assigned to an inpatient service at Duke or the Durham VA. These services include the general medicine services at both hospitals, where internal medicine residents and attendings supervise the students; students may also rotate in the medical intensive care unit, on the cardiology service, or on the oncology service at Duke Hospital. The student functions as an intern on that service with the exception that orders must be countersigned by a resident or attending. Overnight duty consisting of night float responsibilities may be included over the course of the four-week schedule. The supervising resident or attending determines the number of patients assigned with anticipated increases over the four weeks. (3) Methods of Evaluation: Students are evaluated by their residents, fellows, and attendings. The evaluation form is made available to each student at the beginning of the rotation. Prerequisites: permission of instructor is required in order to add the course and permission is required in order to drop the course. Please contact Sheila Gainey at 681-5258 or via email at gaine003@mc.duke.edu for more information. Credit: 5. Enrollment: max 17. *Anna Lisa Crowley, MD, Saumil Chudgar, MD and staff*

MEDICINE-402C. MEDICAL SUBINTERNSHIP IN HEMATOLOGY-ONCOLOGY. (1) Course Goals: This is an intensive experience in the care of inpatients with serious hematologic and oncologic disorders. The student learns to interpret peripheral blood films, how to use and interpret other specialized laboratory tests (e.g., bone marrow aspirate/biopsy, serum electrophoresis, coagulation studies, tumor markers, leukemia cell markers), and how to approach the evaluation and treatment of hematologic and solid tissue malignancies and their complications. (2) How Goals Are Achieved: Under supervision of a Hematology/Oncology fellow and a division staff member, the student is given considerable responsibility in the care of inpatients on one of the Hematology/Oncology or Experimental Therapeutics wards in Duke Hospital. They receive instruction and guidance in performing diagnostic and therapeutic procedures and gain experience in the use of chemotherapeutic drug regimens. Specific issues such as quality of life, care of the aging patient with malignancy, and decisions regarding DNR status are addressed by the patient-care team. In addition, students receive a series of core lectures, receive training in chemotherapy, and attend the ongoing clinical, research and didactic divisional conferences. (3) Methods of Evaluation: Students are evaluated by their preceptors on the basis of their ability to obtain a history, perform a physical examination, evaluate hematologic and other laboratory data, and propose assessments and plans of action. For more information, please contact Sarah Overaker at 684-2287 or via email at overa003@mc.duke.edu. Credit: 5. Enrollment: max 1. *Carlos DeCastro, MD and Medical Oncology staff*

MEDICINE-404C. CARDIAC CARE UNIT SUBINTERNSHIP. (1) Course Goals: Primary - To provide an in-depth experience in the evaluation and care of inpatients with various cardiovascular problems. Secondary -To refine student understanding of the cardiovascular history, physical examination and non-invasive and invasive laboratory testing in evaluating and managing patients with known or suspected cardiovascular disease. (2) How Goals Are Achieved: Students are assigned to the Duke CCU or to a cardiology inpatient service at Duke, and, in concert with the house staff, cardiology fellows, and senior staff attendings, work up and manage patients admitted to these various services. They also participate in a core curriculum experience, including individually assigned times to work with HARVEY, the cardiology patient simulator, and various computer assisted instruction programs. (3) Methods of Evaluation: Students are evaluated by all resident, fellow, and senior staff with whom they work. The evaluation form is available at the beginning of the elective. Depending on circumstances, students may also be evaluated by written and practical examinations at the beginning and/or end of the elective. For more information, please contact Dawne Smith at 668-1524 or via email at dawne.t.smith@duke.edu. Prerequisite: Successful completion of an accredited internal medicine clerkship. Credit: 5. Enrollment: max 2. *Anna Lisa Crowley, MD/FACC and cardiology staff*

MEDICINE-405C. INTENSIVE CARE MEDICINE SUBINTERNSHIP (DUKE). Course Goals: (1) Primary - To introduce the student to a pathophysiologic approach to critically ill adults. Secondary - To provide an opportunity for students to perform selected procedures. (2) How Goals Are Achieved: Students function as sub-interns in a very active intensive care unit. Students perform patient evaluations, procedures, and develop diagnostic treatment plans under the direct supervision of the junior assistant resident, critical care fellow, and attending physician. Night call occurs every third night. Physiology and biochemistry based approach to critical care medicine is stressed. Emphasis is placed on bedside teaching with easy access to attending physicians and critical care fellows for the discussion of specific patient oriented questions. Preferences for the month of rotation are honored, if possible. Questions should be directed to Dr. Govert, 681-5919. (3) Methods of Evaluation: Each student's performance is assessed by the course director through direct observation of the student in the clinical and didactic environments. Input from the residents, fellows, and other attending physicians is obtained, and provides the primary basis for grade assignment. For more information, please contact Donna Permar at 681-5919 or via email at donna.permar@duke.edu. Credit: 5. Enrollment: max 3. *Joseph Govert, MD and critical care staff*

MEDICINE-406C. INTENSIVE CARE MEDICINE SUBINTERNSHIP (DURHAM VA HOSPITAL). (1) Course Goals: Primary - To provide training in clinical, physiologic, and pharmacologic principles of the care of the critically ill. Secondary - To develop students' skills in performance and interpretation of diagnostic procedures. (2) How Goals Are Achieved: Under the supervision of senior assistant residents, the pulmonary fellow and the critical care attending physician, students function as sub-interns and are responsible for patient work-ups and daily bedside presentations. Students are given responsibilities for procedures and decision-making in direct proportion to the development of their patient management skills. Daily radiology and bedside attending rounds stress an integrated physiologic approach to the management of critically ill patients with emphasis on acute respiratory care, hemodynamic monitoring, acid-base balance, nutritional support, palliative care, patient safety, and end-of-life care. Each

student is provided a document linking selected readings that supplement the didactic and bedside discussions on diagnosis, pathophysiology, and recognition and management of critical illness. The student on-call schedule is every fourth night for the duration of this four-week course. The student registered for MEDICINE 406C may drop the course up to one month before the start date. After that time, the student should arrange for a replacement if dropping the course. (3) Methods of Evaluation: Student evaluations are done by the fellows and faculty attending on the MICU and are based on observed performance. For more information, please email amy.loeblein@duke.edu or 919-286-6946. Secondary contact: Dr. Karen Welty-Wolf, 684-4938 or via email at welty001@mc.duke.edu. Students are to meet in the VA MICU's MD workroom for orientation on the first day of the rotation at 0800 a.m., 5A (5th floor A wing), Durham VAMC, after emailing the course director the week before as a reminder of the start date. NOTE: Students must contact the course director at least two weeks before the first day of their scheduled rotation in order to have the allotted time necessary for the VA to get them back into the system. Each student rotating through Medicine 406C must complete the required VA "paperwork" (contact Clyde Meador at clyde.meador@va.gov) no less than 30 days from the first day of the section in which he/she is enrolled. Credit: 5. Enrollment: max 1. *Timothy McMabon, MD, PhD and critical care staff*

MEDICINE-407C. SUBINTERNSHIP IN INTERNAL MEDICINE/PSYCHIATRY. This course is an intensive clinical experience in the diagnosis and treatment of acute co-morbid medical and psychiatric disorders requiring inpatient hospitalization. Students participating in this four-week elective based in Duke Hospital are expected to function at intern-level, assuming care of a small census of complex patients. The Medicine/Psychiatry faculty on the GenMed 12 service provides direct supervision. The goal of the elective is to refine and then clinically apply basic knowledge from the fields of Internal Medicine and Psychiatry. Participation at selected case conferences and didactic sessions is expected. Students are invited to attend the intern lecture series during Psychiatry Academic Half-day and educational offerings in Internal Medicine, including Intern Report. Call is taken in both Medicine and Psychiatry in alternating fashion every fifth night. For more information, please contact Dr. Sarah Rivelli via email, sarah.rivelli@duke.edu or 668-0207. Preference is given to students considering a career in combined Medicine-Psychiatry. Prerequisite: permission of instructor and successful completion of PSYCHTRY-205C and MEDICINE-205C. C-L PSYCHTRY 407C. Credit: 5. Enrollment: max 1. *Sarah Rivelli, MD*

MEDICINE-408C. INTERNAL MEDICINE GENERAL MEDICINE SUBINTERNSHIP. (1) Course Goals: To provide an internal medicine inpatient care experience at the intern level. (2) How Goals Are Achieved: Students are assigned to an inpatient general medicine service at Duke Hospital or the Durham VA Hospital. Internal medicine residents and faculty supervise the student. The student functions as an intern on the service with the exception that orders must be countersigned by a resident or attending. Overnight duty consisting of night float responsibilities may be included over the course of the four-week schedule. (3) Methods of Evaluation: Students are evaluated by their residents and attendings. The evaluation form is made available to each student at the beginning of the rotation. Prerequisites: permission of instructor. Note: Medicine 408C is intended to provide students with an opportunity to do a subinternship on the general medicine service during times of the year that are not high-volume for the Internal Medicine subinternship, Medicine 401C. During high-volume months (traditionally July, August, September, October), students will not be able to enroll in Medicine 408C. Please contact Sheila Gainey at 681-5258 or via email at gaine003@mc.duke.edu for more information. Credit: 5. Enrollment: max 3. *Anna Lisa Crowley, MD, Saumil Chudgar, MD and staff*

MEDICINE-412C. HOSPITAL MEDICINE. The student on the Hospital Medicine elective will help manage acutely ill patients as a member of the Hospital Medicine Service. Four major learning areas will be emphasized. 1) General Medicine consultations for management of hypertension, tachycardia, delirium, diabetes, hypoxia, and perioperative risk assessment. 2) Procedures including thoracentesis, paracentesis, and lumbar puncture through participation and direct observation, simulation, and viewing of procedure videos. 3) Quality improvement modules to learn concepts, design, and submit a quality improvement project to the course director. 4) Overnight patient care with Hospital Medicine attendings with the opportunity to participate in patient admissions, cross cover emergencies, and transitions of care. Prerequisite: Permission of course director is required. Max. Enrollment = 2. Credit: 2. *Saumil Chudgar, MD*

MEDICINE-414C. INTRODUCTION TO OUTPATIENT PRIMARY CARE INTERNAL MEDICINE. The rotation is best suited for students interested in pursuing a career in primary care or internal medicine due to the faster pace of clinic. Course Goals: At the end of the experience, students should be able to 1) Diagnose and manage a number of common internal medicine and primary care problems including a wide variety of diseases that are

generally seen only in the ambulatory setting 2) Be familiar with current guidelines for preventive services and cancer screening, 3) Competently and efficiently take a problem-focused history, perform a directed physical exam and perform some office-based procedures. How Goals Are Achieved: The student will work with faculty preceptors within Duke Primary Care spending one or more days per week seeing patients at various Duke Primary Care Internal Medicine clinics. A diverse mix of patients and conditions are seen in the outpatient setting. Patients present for preventive services, as well as, management of chronic diseases such as diabetes, hypertension, heart disease, osteoporosis, and common mental health conditions. In addition, patients are seen for acute illnesses such as pneumonia, pharyngitis, sinusitis and urinary tract infections on a same day basis. Patients routinely present with symptoms that have not been previously evaluated or diagnosed, allowing students to truly sharpen their clinical skills. The student evaluates selected patients first then presents and discusses the case with the attending. The student must outline in writing five goals that he or she wishes to accomplish during this rotation. The student's goals should be emailed to Dr Waite at least three weeks before the rotation begins. Methods of Evaluation: The faculty preceptor who works directly with the student does the student evaluation. Grades are based on the student's interactions with patients, his or her clinical thinking regarding diagnosis and management of their problems, and documented records. Professionalism, fund of knowledge, and commitment to learning are highly weighted. Prerequisites: Students must be enrolled in their fourth year of medical school at Duke and must have completed first, second, and third year requirements as demonstrated by advancement by the Promotions Committee to fourth year student status. Students must have access to the Duke Maestro Care computer system to effectively function in clinic. Students must contact Dr. Kathleen Waite via email (waite001@mc.duke.edu) to determine time and location for initial meeting. They must also contact Dr. Waite in advance of the course start date to create goals and schedule. Dr. Waite can also be reached by phone at 490-9800. Credit: 1 (10 hrs/wk for 4 weeks) or 2 (20 hrs/wk for 4 weeks). Please note that this is a 1 or 2 credit course only. Enrollment: max 2. *Kathleen Waite, MD and general internal medicine staff*

MEDICINE-415C. CLINICAL MANAGEMENT OF OBESITY. The unique blend of clinical and research programs related to obesity at Duke provides an opportunity for students to learn how to evaluate and manage obesity in many ways. This elective involves attendance in outpatient clinics or residential programs related to obesity or obesity-related co-morbidities including Residential Programs (Diet and Fitness Center), Bariatric Surgery, Pediatric Diabetes, Pediatric Endocrinology, and Lifestyle Medicine. Students will have the opportunity to observe ongoing studies and attend lectures at various clinical and research conferences. In consultation with the course director, an independent project related to obesity will be completed. For more information and permission, please contact Dr. Westman at 620-4061 or via email at ewestman@duke.edu. Permission of instructor is required. Credit: 4. Enrollment: 1. *Eric Westman, MD/MHS; Dana Portenier, MD; Ronald Sha, MD/PhD*

MEDICINE-416C. EFFECTIVE CLINICAL TEACHING. The course aims to make students more effective clinical teachers in preparation for their role as teachers during residency. Strategies include classroom discussion of adult learning theory, facilitating small-group learning, teaching at the bedside, teaching using clinical cases, and giving effective feedback. Weekly participation in role plays of teaching scenarios is required. The final project is an 8-10 minute video-recorded "chalk talk" on the topic of one's choice. Students self-reflect on the talk and obtain feedback from their classmates and instructor to develop a teaching improvement plan. Attendance at course sessions is mandatory. Permission of instructor is required. Students should contact Dr. Saumil Chudgar at saumil.chudgar@duke.edu, to obtain a permission number. Credit: 1. Enrollment: Max 10, Min 4. *Saumil Chudgar, MD*

MEDICINE-423C. RHEUMATOLOGY. (1) Course Goals: To teach students the basics of the evaluation and management of patients with inflammatory and non-inflammatory arthritis, autoimmune and immunological disorders. Diseases seen include the various forms of arthritis as well as other inflammatory diseases such as lupus and other connective tissue diseases, including vasculitis, scleroderma, and myositis. Students will also learn to interpret specialized laboratory studies relating to the evaluation of patients with rheumatic and immunological disorders. Students are exposed to joint aspiration and injection, synovial fluid analysis, musculoskeletal radiology, and histopathological analysis. (2) How Goals Are Achieved: approximately two to three weeks of the rotation are spent in the Duke Rheumatology faculty clinics located in Duke South as well as in Brier Creek (Raleigh). Depending on the student's learning goals, one or two weeks may be spent on the Duke Hospital inpatient rheumatology consultation service. Students may also evaluate outpatients at the Durham VA Medical Center. Duke inpatient consultation rounds consist of faculty, fellows, internal medicine residents and students. Rounds focus on oral presentation of patients including detailed review of history, physical examination findings, pertinent laboratory, x-ray and patho-

logical findings. Students attend all divisional conferences including weekly Rheumatology and Immunology Grand Rounds, Journal Club, the core curriculum series for Rheumatology fellows and other Divisional conferences. Students must complete a minimum of 75% of the web-based learning modules and complete an examination based on the content within these modules to pass the course. Justification for a grade of "honors" includes the following: Direct observation of clinical skills in rheumatology; timely completion of pre- and post-test assessments; completion of various reading assignments throughout the course; attendance at various conferences listed above; brief presentation on a topic of choice (pathogenesis, management, etc.) during the month; and demonstration of exemplary interest and effort during the rotation. Students are assigned primary house officer level responsibilities on the Consultation Service and the Outpatient Clinics at Duke South/Brier Creek and the Durham VA Medical Center Clinic. Emphasis is placed on a comprehensive approach to the evaluation and management of patients with rheumatic, inflammatory, and immunologic disorders. (3) Methods of Evaluation: Students are evaluated by the primary faculty and fellows with whom they work. Evaluations are based on students' performance on rounds and in the clinics, including history and physical examination skills and attendance at various conferences. For more information, please contact Dr. Sam Dalvi (samir.dalvi@duke.edu). Students may also contact Sonya Cameron at 919-681-7405. NOTE: This course may require work at the Durham VAMC. Students must complete the required DVAMC paperwork at least 30 days prior to the first day of the term/section they are enrolled in. Credit: 4. Enrollment: max 2. *Sam Dalvi, MD; Nancy Allen, MD; David Caldwell, MD; Megan Clouse, MD/PhD; Lisa Criscione-Schreiber, MD; Michael Hershfield, MD; Kim Huffman, MD; Mala Kaul, MD/MHS; Rob Keenan, MD; Virginia Kraus, MD/PhD; Sara Wasserman, MD; David Pisetsky, MD/PhD; Steve Sorin MD, William St. Clair, MD; and Ankoor Shab, MD. Sole enrollment*

MEDICINE-424C. FLUIDS AND ELECTROLYTES. The Fluids and Electrolytes Course will consist of eight sessions on both the physiology of fluid, electrolyte, and acid-base homeostasis and on the pathophysiology of fluid, electrolyte, and acid-base disorders. Emphasis will be placed on the clinical application of these concepts: from the rational administration of intravenous of arterial blood gases, to the diagnosis of primary hyperaldosteronism. Students must verify that there is no time conflict with other courses offered during the same time period. The spring 2016 course dates will be announced prior to the Spring 2016 registration period. For more information please contact Dr. Roberts via e-mail at john.roberts@duke.edu. Credit: 1. Minimum Enrollment: 8; Maximum Enrollment 30. *John Roberts, MD; Michael Berkoben, MD; and Ruediger Lebrich, MD*

MEDICINE-425C. CLINICAL COAGULATION. (1) Course Goals: Primary - To teach the clinical and laboratory approach to patients with a hemorrhagic or thrombotic disorders. The student learns to evaluate clinical coagulation disorders and become familiar with coagulation laboratory testing and interpretation. Secondary - To expose the student to recent advances in the area of coagulation research. (2) How Goals Are Achieved: The student spends four weeks on the Hematology Consult Service under the direction of hematology division faculty. The student is expected to work up in-patients with coagulation problems referred to the Coagulation Service as well as participate in a half day a week Coagulation Outpatient Clinic. Patients generally present with complex diagnostic as well as therapeutic problems. The rotation includes Coagulation lab rounds during which the student learns to interpret lab tests and review abnormal results. The student is expected to read standard texts regarding their patients' problems, as well as relevant reviews provided by the attending physician. The student may also interact with the Anticoagulation Management Service to gain a better understanding of various approaches to outpatient management of anticoagulant therapy. Students electing to do an eight week rotation have a more extensive laboratory and clinic research experience. (3) Methods of Evaluation: The student's performance is evaluated by the hematology attending with input from the fellow and/or medicine resident on the service. The evaluation is based on observation of the student's ability to do careful histories and physical examinations, to appropriately assess the problem and develop a logical diagnostic and therapeutic plan, and to demonstrate an increase in knowledge regarding laboratory tests and their application to clinic problems. For more information, please call Sarah Overaker at 684-2287, or by email at overa003@mc.duke.edu. Credit: 4. Enrollment: max 1. *Carlos DeCastro, MD; and hematology staff*

MEDICINE-426C. ADVANCED EFFECTIVE CLINICAL TEACHING. The course builds on the concepts taught in MED 416C to continue to make students more effective clinical teachers in preparation for their role as teachers during residency. Higher-level skills required of a future clinician-educator are emphasized. Strategies include classroom discussion of curriculum development methods and medical education scholarship utilizing adult learning theory. Specific skills taught include teaching in large groups, teaching on the fly, and teaching clinical reasoning. One session will focus on remediating the struggling learner. Participation in role-plays of teaching

scenarios is required. The final project is the development of a curriculum that a student may implement during their residency. Student will self-reflect on their skills and develop a teaching improvement plan. Attendance at course sessions is mandatory. Permission of instructor required and MED 416C is a prerequisite. Contact saumil.chudgar@duke.edu to enroll. Credit: 1. Enrollment Max: 12 Minimum: 5. *Saumil Chudgar, MD, MS.*

MEDICINE-427C. HOSPICE AND PALLIATIVE MEDICINE. Hospice and Palliative Medicine is a specialty that is focused on the treatment of patients living with serious illness. Comprehensive care- including physical (primarily symptom management), psychological, and spiritual- is provided by an interdisciplinary team to patients and families to help alleviate suffering and promote quality of life. This 2 week, 2 credit elective provides students the opportunity to observe and work alongside palliative care practitioners in inpatient settings including the palliative care consult services at Duke University Hospital and Duke Regional Hospital, as well as home and inpatient hospice exposure through Duke Home Care & Hospice. The importance of multi-disciplinary teamwork will be emphasized. Credit: 2. Enrollment Max: 2. Permission of Instructor is required. A schedule will be sent to you by email prior to the first day. For more information and permission to join class contact the course director Dr. Jason A. Webb via email at jason.webb@dm.duke.edu. Secondary contacts: Sheila Juhans (sheila.juhans@duke.edu) and William English, (william.english2@duke.edu) or 919-668-7215. *Jason A. Webb, MD; Anthony Galanos, MD; Nathan Gray, MD; Christopher A. Jones, MD; Kristin Meade, MD; James Tulskey, MD; Megan Jordan, MD; Farr Curlin, MD; Robin Turner, MD; R. Morgan Bain, MD; and Jennifer Gentry, RN, MSN, ANP*

MEDICINE-428C. METABOLISM AND ENDOCRINOLOGY. 1) Course Goals: Primary - The student has an in-depth experience in the evaluation and management of patients with endocrine disorders. Secondary - The student learns basic principles of hormone physiology and applies these concepts in clinical settings. (2) How Goals Are Achieved: Each student is introduced to patient problems by working with the Endocrine faculty. The student is exposed to clinical endocrine disorders by seeing patients in endocrine outpatient clinics (Diabetes/ General Endocrine, and Durham VA Medical Center General Endocrine Clinics), as well as experiencing the inpatient Diabetes Management/General Endocrine Consult Service. The student has the opportunity to review general literature on common endocrinologic conditions and endocrinologic emergencies, as well as learning basic assessment skills of the patient with diabetes, thyroid disease, and other common endocrinologic presentations. Division conferences include Grand Rounds, Case Conference, and Inpatient Consult Rounds with opportunities to integrate basic concepts with clinical applications. (3) Methods of Evaluation: A written critique is provided by the student's preceptors with comments from other members of the division as appropriate. For more information, including where to report on the first day of classes, please contact via email Dr. Beatrice Hong at beatrice.hong@duke.edu or call 919-613-5120. Secondary contact: Dr. Spratt at susan.spratt@duke.edu. Credit: 4. Enrollment: max 2. *Beatrice Hong, MD, Susan Spratt, MD and endocrinology staff.*

MEDICINE 429C. HISTORY OF MEDICINE FOR CLINICIANS. This class examines the critical turning points that have shaped the rise of western medicine. We will explore historical questions regarding the nature of evidence and efficacy, the ways by which medical practice has been shaped by its social and cultural context, and why disease patterns have changed over time. The format will consist of eight weekly discussion sessions based on short lectures and readings (about 40-50 pages per week). Evaluation will be based on class participation, brief reflections, and a final 20-min historical presentation. Permission of instructor is required: contact Jeffrey.baker@dm.duke.edu. Third year students must obtain permission of their mentor in order to take the course. Credit: 1. Enrollment Max: 10. Min: 5. *Jeffrey P Baker, MD.*

MEDICINE-430C. PULMONARY MEDICINE. Course Goals: (1) Primary - To provide training in clinical aspects of pulmonary medicine. The primary diseases emphasized include asthma, chronic obstructive lung disease, pulmonary vascular diseases including pulmonary embolus, acute respiratory failure, hypersensitivity, interstitial and immunologic lung diseases and pulmonary manifestations of systemic illnesses, i.e., sarcoid, scleroderma, cystic fibrosis, etc. Secondary - To provide experience with pulmonary laboratory techniques including pulmonary function testing, cardio-pulmonary exercise testing, chest radiology, and bronchoscopy. (2) How Goals Are Achieved: Students assigned to the Pulmonary Consult Services at either the Durham VA Medical Center or at Duke Hospital. They have primary responsibility for workup and presentation of selected patients on these services. All patients are presented and followed at daily rounds with fellows and faculty. Students also participate in a half-day outpatient clinic each week. Joint seminars and conferences involving both Duke and Durham VA Medical Center. Consult Services are held each week to provide instruction in pulmonary function evaluation, pulmonary physiology, chest radiology, pulmonary pathology and clinical pulmonary medicine. (3) Methods of Evaluation: Student evaluations are done by

fellows and faculty assigned to the Consult Services during the period of the course and are based on observed performance. Questions should be directed to Gina Brewer, via email at gina.brewer@duke.edu or by phone at 684-6140. Dr. MacIntyre can be reached via email at macin001@mc.duke.edu. Secondary physician contact: Dr. Loretta Que at 681-8551. Credit: 4. Enrollment: min 1, max 3. *Neil MacIntyre, MD and pulmonary staff*

MEDICINE-431C. ADULT ALLERGY AND CLINICAL IMMUNOLOGY. Enrollment Requisite: Students must contact Dr. Lugar prior to enrolling in the course.--- The adult allergy and clinical immunology elective consists of direct patient care, didactic sessions, independent readings and hands-on training of various clinical and laboratory test modalities that are used in clinical practice. This elective will provide exposure to patients with various allergic and immunologic disorders including allergic rhinitis, sinusitis, asthma, hypersensitivity pneumonitis, allergic conjunctivitis, diseases associated with autoimmunity, immunodeficiencies and allergic skin diseases. Additionally, the student will obtain hands-on practice with allergy skin testing as well as conducting other immunology labs. The schedule and content can be individualized on the basis of the student's needs and goals. Students must contact the course instructor, Dr. Patricia Lugar, patricia.lugar@duke.edu, to arrange meeting location. Secondary contact: Terri Taylor at 919-668-6961. Credit: 4. Max. 1. *Patricia Lugar, MD; John Sundy, MD/PhD; Anjeni Keswani, MD; and Ankoor Shah, MD*

MEDICINE-433C. EVIDENCE-BASED MEDICINE:PATIENT-CENTERED, CLINICALLY-RELEVANT UTILIZATION OF MEDICAL LITERATURE. Evidence-Based Medicine is a one-credit elective course that will help you make sense of the medical literature. Confused by the obtuse results section of a paper? Wonder how to apply clinical research studies to the patients you care for? In this course, students will meet with faculty during six sessions topically organized to capture the primary types of studies used in clinical practice as well as the skills needed to find and appraise them. Students in Durham are required to attend at least five of the six sessions and make up any missed session in order to receive the credit. The course is offered once, with six sessions usually scheduled between February and March. The spring 2016 dates will be announced prior to the spring 2016 registration period. Classes are 5-7pm. When enrolling, make sure that there are no time conflicts with other courses. The Registrar will update the information in the course description when the schedule is determined. Students will be notified of their meeting location by the course director or designee. For more information, please contact Dr. Gagliardi via email at jane.gagliardi@duke.edu or Megan von Isenburg via email at megan.vonisenburg@duke.edu. Credit: 1 (clinical). Minimum Enrollment:10; Maximum Enrollment: 70. *Jane Gagliardi, MD; Megan von Isenburg, MLS.*

MEDICINE-434C. OUTPATIENT HEMATOLOGY-ONCOLOGY (DUKE OR DURHAM VA). (1) Course Goals: To give the student experience in the diagnosis, long-term treatment, and supportive care of patients with hematologic and oncologic disorders in the outpatient setting. The use and interpretation of peripheral blood films and other specialized laboratory tests (e.g., bone marrow aspirate/biopsy, serum electrophoresis, coagulation studies, tumor markers, leukemia cell markers), as well as an approach to the evaluation and treatment of common hematologic problems (anemias, bleeding and clotting disorders, hematologic and solid tissue malignancies) are included. Issues such as quality of life and care of the geriatric oncology patient are addressed. (2) How Goals Are Achieved: The student is assigned a staff member as preceptor with whom to work in the Hematology/Oncology clinic one to three half- days per week in clinic, depending on the student's schedule and the availability of physicians in clinic. Alternatively, the student may work with several preceptors in the Hematology/Oncology clinic for five full days per week during a four week block. If desired, preceptors who concentrate mainly on hematology or oncology may be arranged. 3) Methods of Evaluation: Students are evaluated by their preceptors on the basis of their ability to obtain a history, perform a physical examination, evaluate hematologic and other laboratory data, and propose assessments and plans of action. NOTE: Students cannot drop the course 2 weeks prior to the course start date. For more information, please call Sarah Overaker at 684-2287. Credit: 4. Enrollment: max 2. *Carlos DeCastro, MD, and Hematology, Medical Oncology and Cell Therapy staff*

MEDICINE-435C. GASTROENTEROLOGY. (1) Course Goals: Primary - To provide an experience from which the student can develop a fundamental approach to the diagnosis and management of digestive diseases. (2). Goals Are Achieved: Through participation in the care of patients under the guidance of the fellows and faculty on the GI Consult Services (Duke Hospital), Liver Service (Duke), Biliary Service (Duke) and Outpatient GI Clinics. (3) Methods of Evaluation: Evaluations are completed by the course director and the fellows working with the student and include clinical skills, fund of basic information, and the ability to apply this knowledge to the care of patients. Course meets at 8:00 am, Monday through Friday. Prior to the start of rotations students will receive an email detailing their specific schedule and on the first day of classes, should plan to meet in the Tyor Conference Room in

the Duke Gastroenterology Clinical Suite, Orange Zone, Room 0343. For more information, please contact Jill Rimmer at 684-2819 or via email at jill.rimmer@duke.edu or *Melissa Garrett, MD* at 684-1817 or via email at melissa.garrett@duke.edu. Credit: 4. Enrollment: max 3. *Melissa Garrett, MD and staff*

MEDICINE-438C. CLINICAL HEMATOLOGY AND ONCOLOGY CONSULTS (DUKE OR DURHAM VA). (1) Course Goals: Students learn how to interpret peripheral blood films, how to use and interpret other specialized laboratory tests (e.g., bone marrow aspirate/biopsy, serum electrophoresis, coagulation studies, tumor markers, leukemia cell markers), and how to approach the evaluation and treatment of common hematologic problems (anemias, bleeding and clotting disorders, hematologic and solid tissue malignancies). (2) How Goals Are Achieved: Students receive a series of core lectures, gain familiarity with chemotherapy regimens and administration, and attend the ongoing clinical, research, and didactic divisional conferences. Clinical duties include the performance of inpatient consults under the supervision of a fellow and staff member. This course may be taken for four or eight weeks. (3) Methods of Evaluation: The students are expected to perform and present initial evaluations of consult cases including peripheral blood film on daily rounds, and to perform limited literature searches and evaluations of chosen clinical topics. For more information, please contact Sarah Overaker at 684-2287 or via email at overa003@mc.duke.edu. Credit: 4. Enrollment: max 2. *Carlos DeCastro, MD and hematology/oncology staff*

MEDICINE-440C. CLINICAL INFECTIOUS DISEASES. The objectives of this course are learning principles in Infectious Diseases and Antibiotic Stewardship and will be specifically achieved through the consult service cases and teaching by the Infectious Disease Fellows and Attendings. The students will be able to work-up and present cases to Fellows and Faculty and attend multiple conferences that occur each week (Journal Clubs, Grand Rounds and Case Conferences). The basic principles of Infection Management and Antibiotic Stewardship will be taught by Fellow and/or Attending Physician and this education should provide a platform to utilize during house officer training and care in most medical and surgical specialties. The teaching methods will be: case presentations, rounding daily on the Infectious Diseases Service to hear all cases, attending Clinical Microbiology Rounds, and attending Infectious Diseases Conferences. This course strives to allow the student to appreciate the clinical “thought processes and principles around diagnosis and management of Infectious Diseases”. Grading criteria are subjective and the direct responsibility of the individual attending physician on the service. There are no objective tests to support the grade. The student is encouraged to be involved and attempt to learn as much as possible. This enthusiasm for learning is the expectation of Fellows and Faculty for the student. The reward will be knowledge. The feedback for the student may be gathered by direct interaction with the attending physician. NOTE: This elective requires students to complete some rotations at the VA Medical Center. Please note that you must complete the required VA paperwork no later than 30 days from the 1st day of your scheduled class in order to participate. Paperwork should be obtained from the course director or their designated staff. For more information, please call Michelle Harris at 684-6854 or email michelle.a.harris@duke.edu. Credit: 4. Enrollment max. 7. *John Perfect, MD*

MEDICINE-442C. CLINICAL ARRHYTHMIA SERVICE. (1) Course Goals: Primary - To provide students with an in-depth exposure to the diagnosis and management of cardiac arrhythmias, electrophysiologic studies, ablation of arrhythmias, cardiac pacemakers, and implantable defibrillators; to help students to understand the electrophysiologic events that result in arrhythmias and ECG changes. Special emphasis will be placed on ECG interpretation. This course is not designed to be a substitute for the general cardiology elective (MEDICINE 404C and 445C). Secondary - To familiarize the student with certain basic techniques of arrhythmia diagnosis; (2) How Goals Are Achieved: The student spends four weeks working on the Clinical Arrhythmia Service. The student makes rounds on the inpatient Clinical Electrophysiology Service on patients with arrhythmias. The student is encouraged to attend electrophysiologic studies and assist in the analysis of data from these studies. Attendance at electrophysiologic surgical procedures is also encouraged. The student is responsible for the work-up of patients admitted to the Arrhythmia Service as well as inpatient consults and plays an important role in the follow-up of these patients while they are in the hospital. The student may elect to see outpatients during Arrhythmia Clinics that meet on Monday, Tuesday, Wednesday, and Thursday in the PDC (Duke Clinic). The student assists in the evaluation of patients for permanent pacemaker and defibrillator implantation. Students are responsible for reviewing the literature on subjects related to the patients that they have seen on the clinical service. Didactic conferences are given on Monday and Wednesday mornings; (3) Methods of Evaluation: Students are evaluated on their clinical skills in taking histories, performing physical examinations interpretation of the ECG as well as in their presentation and assessment of the patient's problem. They are also assessed on their ability to read and understand the relevant literature and their ability to assume a responsible role in the care of patients on the Clinical Arrhythmia Service. Students should

meet at Conference Room 7451A Duke North Hospital at 7:30 a.m. and page Dr. Grant (970-6656) if he is not there shortly after 7:30 a.m. For more information, please email Dr. Grant at grant007@mc.duke.edu. Credit: 4. Enrollment: max 1. *Augustus Grant, M.B., CH.B., PhD; Ruth Greenfield, MD; Tristram Babnson, MD; and Sana Al-Khatib, MD/MHS*

MEDICINE-444C. CLINICAL HEART FAILURE AND CARDIAC TRANSPLANTATION. This course is designed to allow the student to gain a broad experience in the fields of heart failure and cardiac transplantation. The student will participate in both inpatient rounds and outpatient clinics. There will also be an opportunity to participate in the surgical management of heart failure including the use of mechanical circulatory support devices, high-risk palliative cardiac surgical procedures and cardiac transplantation. The learning objectives of the course are supplemented by multidisciplinary rounds, cardiac transplant listing conference and cardiac pathology rounds. For more information, please contact Dr. Rogers' assistant, Kerri Pulliam-Ottwell at 681-1370 or you may contact her via email,kerri.pulliam@dm.duke.edu. Credit: 4. Enrollment: max 2. *Joe Rogers, MD and other faculty*

MEDICINE-445C. CONSULTATIVE CARDIOLOGY. (1) Course Goals: Primary - To refine and further develop the skills necessary for eliciting an accurate, complete CV history and for performing an accurate, complete CV physical examination: To refine student understanding of normal and pathologic cardiovascular physiology while functioning in the role of a consultant for inpatients and outpatients with various cardiovascular problems; Secondary - to develop the skills necessary to quickly and accurately interpret ECGs (both 12-lead ECGs and rhythm strips). (2) How Goals Are Achieved: Students are assigned to the consult service at either the Durham VA Center or Duke, where, in concert with the resident, fellow and senior staff attending, they evaluate the operative risk for cardiac and non-cardiac surgery as well as make decisions concerning the evaluation and treatment of patients with a wide variety of heart diseases. Students participate in reading ECGs and a core curriculum experience including individually assigned times to work with HARVEY, the cardiology patient simulator, and various computer assisted instruction programs. (3) Methods of Evaluation: Students are evaluated by the resident, fellow, and senior staff with whom they work. The evaluation form is made available at the beginning of the elective. Depending on circumstances, students may also be evaluated by written and practical examinations at the beginning and/or end of the elective. NOTE: Students enrolled in this course may be required to complete their rotation at the DVAMC. The required paperwork for the DVAMC must be completed at least 30 days prior to the first day of classes for the section/term the student is enrolled. Contact the department to obtain required paperwork. For more information, please contact Dawne Smith, 668-1524 or via email at dawne.t.smith@duke.edu. Prerequisite: none. Credit: 4. Enrollment: max 5. *Anna Lisa Crowley, MD/FACC; and cardiology staff*

MEDICINE-446C. NEPHROLOGY. (1) Course Goals: Primary: To provide clinical experience in the diagnosis and treatment of patients with kidney diseases, fluid and electrolyte disorders, and hypertension. Secondary: To integrate physiology, immunology, pathology, and biochemistry into the evaluation and management of patients with renal disease. (2) How Goals Are Achieved: The students are integrated into the patient care team consisting of attending physician, nephrology fellows, and medical residents. They will participate in both inpatient and outpatient care of patients with a wide range of kidney diseases, fluid and electrolyte problems, and difficult to manage hypertension. Students may choose between the three major nephrology services: the Acute Service which cares for patients in the intensive care units at Duke, the Transplant Service which focuses on patients with kidney or combined kidney-pancreas transplants, and the Durham VA Medical Center General Nephrology Service which provides balanced exposure to all facets of nephrology. The student participates in work rounds with the residents and fellows each day, daily rounds with the attending physician, and weekly nephrology conferences. These conferences include Journal Club where the latest clinical and basic science literature is reviewed, the weekly Nephrology Didactic Lecture Series focusing on pathophysiological principles of clinical nephrology, and Grand Rounds encompassing Pathology Conference, Clinical Case Conference, and seminars by fellows, faculty and/or visiting professors. This combination of broad-based clinical experience, coupled with formal didactics, provides the student with a comprehensive educational opportunity. (3) Methods of Evaluation: Written evaluation from faculty preceptor. For more information please contact Dr. Evans via email at evans122@mc.duke.edu or by phone at 660-6858. Students should meet on the first day at Duke Hospital, Dialysis Unit, 7th floor near 7900. Unit phone: 681-7800. Please meet promptly at 9:00 a.m. Acute Fellow page: 970-7746. Credit: 4. Enrollment: max 4. *Kimberley Evans, MD, and nephrology staff*

MEDICINE-449C. GERIATRIC MEDICINE. 1) Course Goals: Primary - To enable the student to become familiar with the principles of caring for the geriatric patient. Secondary - To familiarize the student with the physiology and diseases of aging. (2) How Goals Are Achieved: This elective is offered by the interdepartmental faculty of

the Division of Geriatric Medicine. The student works with faculty, fellows, and housestaff in a number of settings involved in the care of the geriatric patient. These include the Geriatric Evaluation and Treatment Clinic (Duke), Geriatrics Consultation Service (Duke Hospital), The Forest at Duke Clinic, Community Living Center (Durham VA Medical Center) and other subspecialty clinics. Principles to be stressed are biology and pathophysiology of aging, multiple clinical problems in the elderly, interdisciplinary team approach to evaluation, planning and treatment, goals of maximal functional achievement and independence for the elderly. Specific clinical problems that students encounter include dementia, delirium, polypharmacy, gait instability and falls, urinary incontinence, pressure sores, and chronic pain. The student participates actively in the work-up and management of patients inpatient extended care and outpatient settings. Familiarity with the growing literature in geriatric medicine is encouraged. The student participates in seminars, lectures and team meetings at the appropriate sites. (3) Methods of Evaluation: Evaluation is by consensus of instructors and fellows at the various training sites and the papers submitted during the rotation and at the conclusion of the rotation. It is based on discussions and presentations throughout the course period. If students are registering for the course within 15 days of starting the rotation, they must contact Michele Burgess at 660-7577 to notify her of their late registration and request permission to enroll. Permission will be based upon availability of clinical experiences for the team identified. No students will be accepted for registration after 4PM on the Wednesday before a Monday rotation start. As noted above, students registering within 15 days of the rotation start are expected to call the Michele Burgess immediately to notify her and request permission. Prerequisite: Successful completion of first and second year of medical school. NOTE: Students taking this course may be required to complete rotations at the Durham VA Medical Center. Please contact the department to obtain the required paperwork. Paperwork must be completed 30 days prior to the first day of the section in which the student is enrolled. Students that have not completed the paperwork will not be allowed to work at the Durham VA Medical Center. For more information please contact Michele Burgess at michele.burgess@duke.edu or by phone, 660-7577. Credit: 4. Enrollment: max 1. *Jack Twersky, MD; Gwendolen Bubr, MD; Mitchell Heflin, MD/MHS; Kenneth Lyles, MD; and other staff*

Neurology

Chair: Richard J. O'Brien, MD, PhD

Campus Box:2900

Phone: (919) 684-0053; Assistant: Elizabeth Wheeler

Business Manager: Ronald Beauvais

Department/Faculty Information: <http://neurology.duke.edu/>

Required Courses

NEURO-205C. NEUROLOGY. This four week experience in clinical neurology teaches the principles and skills underlying the recognition and management of the neurologic diseases a general medical practitioner is most likely to encounter in practice. The clerkship is comprised of two, two-week rotations with one rotation centered in outpatient neurology, and the other in inpatient neurology. Student conferences will address major clinical issues in neurology, and patient-oriented problem sessions will address differential diagnosis of neurological symptoms, review pertinent neuroanatomy, diagnostic testing, test utilization, and management of emergent and routine neurologic problems. Secondary contact: Chris Berry at 613-0314 or via email, christine.berry@duke.edu. Credits: 4. Course Director: *Vern Juel, MD*

NEURO-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT)-NEUROLOGY. This four week experience in clinical neurology teaches the principles and skills underlying the recognition and management of the neurologic diseases a general medical practitioner is most likely to encounter in practice. The clerkship is comprised of two, two-week rotations with one rotation centered in outpatient neurology, and the other in inpatient neurology. Student conferences will address major clinical issues in neurology, and patient-oriented problem sessions will address differential diagnosis of neurological symptoms, review pertinent neuroanatomy, diagnostic testing, test utilization, and management of emergent and routine neurologic problems. Secondary Contact: Christine Berry (christine.berry@duke.edu). Credits: 4. Course Director: *Vern Juel, MD*

Second Year, Two-Week Clinical Selectives

NEURO-401C. NEUROLOGY SUBINTERNSHIP. (1) Course Goals: To provide a neurological patient care experience at the intern level. Students have the opportunity to apply neurological examination skills learned in the second year to direct patient care situations. Students are exposed to a variety of neurological problems, procedures,

and therapies. This course is recommended for the student interested in neurology, psychiatry, internal medicine, neurosurgery, neuropathology or ophthalmology. (2) How Goals Are Achieved: Students are assigned to a Duke Hospital inpatient neurology service for two or four weeks with an option to be assigned to the Neuroscience intensive Care Unit for two weeks. Students attend Neuroscience Grand Rounds, Neurology Subspecialty Conferences and participate in all ward or NICU activities. Full time participation is expected. (3) Methods of Evaluation: Resident and staff physicians provide a written evaluation and grade. For more information, please contact Chris Berry via email at christine.berry@duke.edu or by phone, 613-0314. Prerequisite: Medicine 207C or 417C. Permission of Instructor is Required. Credit: 5. Enrollment: max 2. *Vern Juel, MD; Vani Chilukuri, MD, Keith Dombrowski, MD; Carmelo Graffagnino, MD; Jodi Hawes, MD; Brad Kolls, MD; Daniel Laskowitz, MD; E. Wayne Massey, MD; Joel Morgenlander, MD; and Mark Skeen, MD*

Fourth Year Clinical Electives

NEURO-402C. NEUROLOGY CLERKSHIP. This course is restricted to those students who did not take a Neurology clerkship (Medicine 207C, Neuro 205C, 206C, or 257C) in their second year. It provides the student with a firm understanding of the neurological examination, formulation of clinical neurological problems, and practice with written and oral communications in a hospital setting. The student has the opportunity to apply the neuro-anatomy, neurophysiology, neurochemistry, and neuropathology learned in the first year to the evaluation and care of his or her patients. The patients are drawn from the neurology services at Duke Hospital or the Durham VA Medical Center. The students elicit a history and perform a physical examination. The student records the findings in the hospital charts and presents the findings at regular staff rounds. The student then participates with a clinical team of faculty and house officers in the hospital evaluation of the patients. The student is encouraged to participate in all diagnostic procedures such as lumbar puncture. The student has the opportunity to follow patients through neuro-radiological and neuro-surgical procedures forming part of evaluation and treatment. The specific expectations for the student are: (a) to perform and record a competent neurological and history examination on each admitted patient; (b) to be competent in the hospital management of neurological patients including diagnostic evaluations such as hematological and urine evaluations, lumbar puncture and appropriate electrical studies; (c) to assume responsibility as the primary care person for his or her patients; (d) to participate in daily work rounds with an assigned team of house officers and faculty; (e) to be sufficiently knowledgeable to participate in patient care decisions; (f) to attend faculty attending rounds and to present patients to faculty within 24 hours after admission; and (g) to participate in neurology service rounds and conferences during the course. A written evaluation is provided to the students by faculty and house staff. For more information, please call Christine Berry at 613-0314 or via email at christine.berry@duke.edu. VA student credentialing is required prior to registration. Credit: 4. Enrollment: max 1, with Director permission only. *Vern Juel, MD and neurology staff*

NEURO-403C. CLINICAL NEUROLOGY SUBSPECIALTIES. (1) Course Goals: To provide the student clinical exposure to a specific subspecialty in neurology. (2) How Goals Are Achieved: The student focuses on one specific subspecialty in neurology and attends clinic for 3-8 hours weekly. During that time the student participates in the clinical evaluation of patients with a member of the neurology faculty. Clinical experience in epilepsy and sleep disorders, cerebrovascular disorders, headache/pain, memory disorders, movement disorders, and neuromuscular disorders are available. Appropriate reading material is utilized to complement the clinical experience. Medicine 207C, 257C, or 417C are prerequisites for this course. (3) Method of Evaluation: Standard written evaluation form by faculty supervisor. Approval by the course director is required in order to ensure access to the desired neurologic subspecialty. For permission information, please contact Christine Berry, 613-0314 or via email, christine.berry@duke.edu@duke.edu. VA student credentialing is required prior to registration. Credit: 1-2. Enrollment: max 3 (if participating in different subspecialties). *Vern Juel, MD; Richard Bedlack, MD, PhD; James Burke, MD, PhD; Vani Chilukuri, MD; Timothy Collins, MD; Larry Goldstein, MD; Carmelo Graffagnino, MD; Jeffrey Guptill, MD; Jodi Hawes, MD; Lisa Hobson-Webb, MD; Aatif Husain, MD; Brad Kolls, MD; Janice Massey, MD; Rodney Radtke, MD; Burton Scott, MD, PhD; Saurabh Sinha, MD, PhD; Warren Strittmatter, MD*

NEURO-404C. CONSULTATIVE NEUROLOGY. (1) Course Goals: To introduce senior medical students to the diagnostic and treatment issues encountered on the consultative neurology service. (2) How Goals Are Achieved: The student becomes part of the inpatient neurology consultation team either at Duke Hospital or the Durham VA Medical Center. This team consists of rotating neurology faculty as well as a neurology and/or medicine house officer. Consultations are performed by the student under the guidance of the house staff and then are presented to the attending on rounds. The student is responsible for performing a neurologic history and physical as well as assisting

in the interpretation of all important laboratory data. The student continues to follow the patient's course as required. The student also attends rounds when other patients are presented by the house officers. Appropriate reading material is utilized to compliment the clinical experience. Attendance at Neurology Grand Rounds and various Neurologic Subspecialty Conferences is required. (3) Method of Evaluation: Standard written evaluation by faculty supervisor with house staff input. VA student credentialing is required prior to registration. Permission of the instructor is required. Credit: 4. Enrollment: max 1. For more information, please contact Christine Berry, 613-0314 or via email, christine.berry@duke.edu. *Vern Juel, MD and neurology faculty*

Neurosurgery

Chair: John H. Sampson, MD, PhD, MBA MHSc

Campus Box: 3807

Phone: (919) 684-3271; Fax: (919) 681-7973

Division Administrator: Ben Pratt, ben.pratt@duke.edu

Division Contact: Tecca Wright, tecca.wright@duke.edu

Department/Faculty Information: <http://neuro.surgery.duke.edu/>

Fourth Year Clinical Electives

NEUROSUR-401C. SUBINTERNSHIP IN NEUROLOGICAL SURGERY. This course is designed for those students with a career interest in one of the neurological sciences. Duties include the work-up and care of inpatients, work-up of clinic patients, assistance in the operating room, daily rounds, and night call. Students will be expected to assume intern-level responsibilities. Weekly conferences are held in neurosurgery, neurology, neuropathology, and neuroradiology. There are also special lectures. Permission of course director is required. For more information and permission numbers, please contact Sherolyn Patterson at 684- 3053 or via email at sherolyn.patterson@duke.edu. First Day of Classes: students are to meet promptly at 6:00a.m., 8th floor (Neuro ICU) at Duke North Pavilion. NOTE: Students completing this subinternship are required to complete rotations at VA Medical Center and must complete required paperwork no later than 30 days prior to the start of the section in which you are enrolled. Credit: 5 Enrollment max: 3 Min: 1. *Carrie Muh, MD; Allan Friedman, MD; David Adamson, MD; Carlos Bagley, MD/MPH; Herbert Fuchs, MD/PhD; Michael Haglund, MD/PhD; Robert Isaacs, MD; John Sampson, MD/PhD; Dennis Turner, MD; Ali Zomorodi, MD; Oren Gottfried, MD; Fernando Gonzalez, M.D; Eric Thompson, MD; Isaac Karikari, MD; and Peter Fecci, MD*

NEUROSUR-402C. INTERMEDIATE CLINICAL NEUROSURGERY. This elective is intended as an intermediate experience that focuses on the clinical presentation of common neurosurgical disorders, radiographic evaluation, and therapeutic options including the indications and contraindications for surgical intervention. The student sees patients each morning with the neurosurgical team and chooses one or two patients to evaluate in more detail. The student attends one of the neurosurgery clinics or participates in the OR each morning after rounds, and attends the Wednesday academic day neurosurgical conferences. For more information and permission numbers, please contact Sherolyn Patterson at 684-3053 or via email at sherolyn.patterson@duke.edu. First Day of Classes: students are to meet promptly at 6:00 a.m. in the Duke Medical Pavilion (DMP) 8 East ICU. Credit: 2 (effective spring 2016). Enrollment max: 3. *Carrie Muh, MD (course director); John Sampson, MD/PhD; Allan Friedman, MD; Michael Haglund, MD/PhD; Herbert Fuchs, MD/PhD; Nandan Lad, MD/PhD; Robert Isaacs, MD; Dennis Turner, MD; Ali Zomorodi, MD; Oren Gottfried, MD; Fernando Gonzalez, MD; Eric Thompson, MD; Isaac Karikari, MD; and Peter Fecci, MD*

NEUROSUR-404C. NEURO-ONCOLOGY. This 4-week advanced rotation will provide medical students an opportunity to experience to Neuro-Oncology. Students will rotate in the Brain Tumor Center (BTC) Clinic, located in Cancer Center Clinic 3-1, with neuro-oncology faculty. Students will develop a clinical foundation in the care of brain tumor patients and will have the chance to care of patients during all times of the illness trajectory (at diagnosis, during treatment, stable disease, and transitioning to palliative care). At pre-selected times, they will be able to view brain tumor surgeries with our neurosurgeons, thus providing a complete view of multidisciplinary brain tumor patient care. Permission of the instructor is required. For more information, please contact Dr. Peters via email at katherine.peters@duke.edu or you may contact her assistant, Kelly Seagroves at kelly.seagroves@duke.edu or by phone, 919-684-6173. Credit: 4 credits. Maximum Enrollment Per Section: 1 student. Course Director: *Katy Peters, MD, PhD; Other faculty: Annick Desjardins, MD, Gordana Vlabovic, MD, Tulika Ranjan, MD, Henry Friedman,*

MD, Jason Watts, MD, Allan Friedman, MD, John Sampson, MD, David Adamson, MD. Students will also interact with staff in the Brain Tumor Clinic and Neuro-Oncology Fellows.

Obstetrics and Gynecology

Haywood Brown, MD

Campus Box 3084

Phone: (919) 668-3948; Fax: (919) 668-5547

Assistant: Laverne Alston

Business Manager: Jim Morgridge, MBA, CPA

Department/Faculty Information: <http://obgyn.mc.duke.edu/>

Required Courses

OBGYN-205C. OBSTETRICS AND GYNECOLOGY. This second year clerkship is required of all second-year students and consists of six weeks in general obstetrics and gynecology. Students attend lectures, work daily in the general and special outpatient clinics, and are assigned patients on the obstetric and gynecologic wards. Students share in patient care, teaching exercises, and in daily tutorial sessions with the faculty. Clinical conferences, a gynecologic-pathology conference, endocrine conferences, and correlative seminars and lectures are included. Credit: 6. *Elizabeth Livingston, MD*

OBGYN-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT) - OBSTETRICS-GYNECOLOGY. This second year clerkship is required of all second-year students in the Primary Care Leadership Track (PCLT). The course consists of six weeks in general obstetrics and gynecology. Students attend lectures, work daily in the general and special outpatient clinics, and are assigned patients on the obstetric and gynecologic wards. Students share in patient care, teaching exercises, and in daily tutorial sessions with the faculty. Clinical conferences, a gynecologic-pathology conference, endocrine conferences, and correlative seminars and lectures are included. Credit: 6. *Elizabeth Livingston, MD*

Second Year, Two-Week Clinical Selectives

OBGYN-220C. PRENATAL DIAGNOSIS. Students will spend 2 weeks in one of the prenatal diagnostic units within Duke. They will divide their time between diagnostic ultrasound and genetic counseling. Some time will also be allotted to lab time in the cytogenetics lab. The student will be expected to learn common fetal malformations, genetic disorders and syndromes and be able to discuss their etiologies and evaluation. The student will be expected to understand common screening techniques in the prenatal period including pedigree analysis and risk assessment. Enrollment Max. 1. Location: Fetal Diagnostic Center is located at Lofts at Lakeview, 2608 Erwin Road, Suite 200 (above Chipotle Grill). For more information, please contact Dr. Brita Boyd via email at brita.boyd@duke.edu and/or Regan Matthews at chall002@mc.duke.edu regarding start time. Dr. Boyd can be reached by phone at 919-684-2595. Students should meet at 8:30am in the Fetal Diagnostic Center reading room the first Monday of the rotation. *Brita Boyd, MD*

OBGYN-221C. INTRODUCTION TO REPRODUCTIVE ENDOCRINOLOGY. This course is a short introduction to reproductive endocrinology for students interested in a career in reproductive medicine. Because of the short duration of the course, each student is encouraged to focus either on the clinical or laboratory aspects of the service. During the course, each student will research a focused question in reproductive endocrinology and present his/her findings at a division meeting. Students must contact the instructor prior to registration. Credit: 2. Enrollment Max. 1. Location: 5704 Fayetteville Road, Durham, NC 27713. Please contact Anne Wade at 572-4669 or by email at wade0022@mc.duke.edu for more information about the meeting time. *William Hurd, MD*

OBGYN-222C. GYNECOLOGIC SURGERY. This two-week selective is designed to introduce the second year medical student to the surgical management of gynecologic disease, focusing on benign and urogynecologic disorders, pelvic floor reconstruction, and minimally invasive surgery. Students will be assigned to Duke Regional Hospital and participate in patient care and informal didactic instruction in the OR, wards, clinics and ED. Students will research and give informal presentations on assigned topics in gynecologic surgery. Prerequisite: must have successfully completed OBGYN 205C or COMMFAM 205C. Credit 2. Enrollment Max. 1. Please contact Patt Dennis (patricia.dennis@duke.edu) for more information. Meeting place: MIGS Clinic, 3116 North Duke Street, Durham, NC 27704. *Craig Sobolewski, MD*

Fourth Year Clinical Electives

OBGYN-420C. GYNECOLOGIC CANCER. This course presents a clinical experience in the management of patients with a gynecologic malignancy. This will include operating room, inpatient unit and clinic experiences. The student assumes the role of a sub-intern. Outpatient, inpatient, and operative exposure to these patients is extensive. For more information, please call 684-3765. Students should report at 6:30 a.m. to 7700 Duke Hospital on the first day of classes. Credit: 4. Enrollment: max 1. Andrew Berchuck, MD; Laura Havrilesky, MD; Paula Lee, MD/PhD; Fidel Valea, MD; Angeles Secord, MD; and gynecologic oncology fellows

OBGYN-431C. CLINICAL REPRODUCTIVE ENDOCRINOLOGY AND INFERTILITY. Course for students who desire additional basic and clinical experience in examination, diagnosis, and treatment of obstetric and gynecologic patients with endocrinopathy and infertility. Course consists of clinical core of reproductive endocrine problems correlated with examination and treatment of patients in the Endocrinology Outpatient Clinic, in surgery, and in the hospital. Exposure to assisted reproductive technologies is also available depending on the current clinical load. For more information, please contact Anne Wade at 919-684-4673 or via email, anne.wade@dm.duke.edu. Credit: 4. Enrollment: max 1. *William Hurd, MD*

OBGYN-447C. CLINICAL OBSTETRICS SUB-INTERNSHIP. For students preparing for general practice of medicine, pediatrics, or obstetrics and gynecology. This course studies the relationship of clinical factors during pregnancy, labor, and delivery. Emphasis is placed on abnormal conditions of pregnancy as related to the infant. Current problems in the maternal-fetal relationship are outlined. The student functions on an intern level and takes part in activities of the housestaff and faculty. Opportunities for experience in prenatal ultrasound, diagnosis and genetic counseling available. Meet on the 5th floor of Duke Hospital, L&D workroom at 7:00AM on the rotation's first day (rounds begin at 7:10AM). For more information, please contact Dr. Elizabeth Livingston at 681-5220. Secondary contact: Jade Arnold, 613-5156 or livin001@mc.duke.edu. Credit: 5. Enrollment: max 1. *Elizabeth Livingston, MD*

OBGYN-449C. CLINICAL UROGYNECOLOGY. For students preparing for obstetrics and gynecology, general practice, surgery, and urology. Emphasis is placed on the outpatient assessment and inpatient or ambulatory management of patients with acute and chronic gynecologic disorders including pelvic floor dysfunction, pelvic organ prolapse, urinary and fecal incontinence, and others. Students have the opportunity to work closely with faculty members in the Division of Urogynecology. Participation in the operative care of Urogynecologic patients is desired. Time for independent study is planned. The student is expected to utilize this time to review and present a specific clinical problem with frequent guidance and input from a member of the Urogynecology Division with similar interests. For more information, please call Cynthia Paylor at 919-401-100 or via email, cynthia.p.paylor@duke.edu to determine time and location to report. Students should report to Patterson Place Clinic, 5324 McFarland Drive, Durham, NC, 27707, suite 310, on the first day of classes. Max 1. *Alison Weidner, MD; Cindy Amundsen, MD; Amie Kawasaki, MD; Nazema Siddiqui, MD, MHS; Tony Visco, MD; and urogynecology fellows.*

Ophthalmology

Edward Buckley, MD
Suite 3002, AERI Building
Campus Box 3802
Phone: (919) 684-5846; Fax: (919) 681-6343
Assistant: Colleen Kelly
Business Manager: Adrienne Lloyd
Department/Faculty Information: <http://dukeeyecenter.duke.edu/>

Second Year, Two-Week Selectives

OPHTHAL-220C. OPHTHALMOLOGY. This ophthalmology selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive ophthalmology, including subspecialties (neuro-ophthalmology, external disease, oculoplastics, cornea, refractive surgery, pediatrics, strabismus, glaucoma, and vitreoretinal disease). There will be didactic instruction with patient care exposure in the clinic setting and operating room. Credit: 2. Enrollment max. 5. Location: Lobby of Eye Center. Please contact Becky Pendergraft at 684-6853 for more information. *H Tina Singh, MD*

Fourth Year Clinical Electives

OPHTHAL-420C. MEDICAL OPHTHALMOLOGY. This lecture series emphasizes common ophthalmic conditions. The ophthalmic signs and symptoms of ocular and systemic diseases are presented in a lecture series. No clinic or operating room exposure or hands on experience. Oriented for those students interested primarily in family medicine, pediatrics, internal medicine, or ophthalmology. This clinical science course can be audited. Students should report to the AERI Resource Center, Room 1002, 1st floor, every Tuesday and Thursday from 12 to 1pm. For more information students may contact Becky Pendergraft at (919)684-6853. Credit: 1. Enrollment: min 8, max 20. H. *Tina Singh, MD*

OPHTHAL-422C. GENERAL OPHTHALMOLOGY. A clinical preceptorship in which the student participates and observes the regular house staff activities including night call, conferences, lectures, patient care, and treatment including surgery. The use of specialized ophthalmic apparatus is emphasized. Students should report to the 1st floor lobby of the Duke Eye Center building @ 7:45 am to see Becky Pendergraft (919)684-6853. Prerequisites: OPHTHAL 420C recommended, but not required. NOTE: This elective course requires work at the DVAMC. Students must complete required VA paperwork at least 30 days prior to the start of the term/section enrolled. Credit: 4. Enrollment: max 4. H. *Tina Singh, MD*

OPHTHAL-425C. PEDIATRIC OPHTHALMOLOGY. A clinical preceptorship in which the student participates in the outpatient pediatric ophthalmology clinic. The student will encounter the more common ocular disorders of childhood including ocular motility disturbances, congenital cataracts, glaucoma, and congenital genetic and metabolic disorders. In addition, adult motility disorders and neuro-ophthalmic disease such as thyroid eye disease, cranial nerve palsies, and optic nerve abnormalities will be encountered. The diagnosis and treatment aspects are emphasized heavily and opportunities to observe surgery are provided. The course meets by arrangement and requires a minimum of 5 days per credit. For more information, please call 684-3957. Credit: 1 or 2. Enrollment: max 3. *Edward Buckley, MD; Laura Enyedi, MD; Sharon Freedman, MD; Grace Parkalapakorn, MD; David Wallace, MD*

Orthopaedics

Chair: **Ben Alman, MD**

Campus Box DUMC 2887

Phone: (919) 684-2894; Fax: (919) 681-8377

Assistant: Melanie Frank

Business Manager: Mike Gagnon

Department/Faculty Information: <http://ortho.surgery.duke.edu/>

Second Year, Two-Week Selectives

ORTHO-222C. ORTHOPAEDIC SURGERY EXPERIENCE. This course involves a rigorous experience working on the Orthopaedic Surgery Service. Duties include inpatient care, outpatient examination, operating room experience, and emergency room call. Conference attendance is required during both weeks. regular discussions are conducted with attending staff and residents. This course will emphasize broad concepts of orthopaedics and will be useful for all students regardless of their career choices. For more information and to obtain a permission number, please contact Wendy Thompson at 684-3170 or via e-mail at wendy.thompson@duke.edu. Credit: 2, Enrollment max: 3. *William Hardaker, MD*

Fourth Year Clinical Electives

ORTHO-421C. FRACTURES/MUSCULOSKELETAL TRAUMA. Students participate in the emergency management of patients through the Duke Emergency Room. Principles of fractures and trauma are given during emergency room assignment. Requirements are attendance at one outpatient clinic per week, two nights per week on call in the emergency room, and conference attendance. Students planning to apply for orthopaedic residency are required to complete 429C prior to taking this elective. For more information and to obtain a permission number, please contact Wendy Thompson at wendy.thompson@duke.edu or 684-3170. Credit: 3. Enrollment: maximum 2 students per four week section. Permission is Required. *Robert D. Zura, MD; Duke Orthopaedic Staff*

ORTHO-429C. SUBINTERNSHIP IN ORTHOPAEDIC SURGERY. A full educational experience in orthopaedic surgery with duties and responsibilities similar to a first year resident. Students will have the opportunity to rotate through various orthopaedic subspecialties including trauma, joint arthroplasty, sports medicine, and foot and ankle. Inpatient care, outpatient examination, operating room experience, and emergency room call are expected.

Individual or group discussions are conducted each day with attending staff/residents. Conference attendance and emergency room call are required. Credit: 5. Enrollment: max 4 for 4 weeks. Summer section 41, maximum of 2 students. Permission of Instructor is Required. For more information and to obtain a permission number, please contact Wendy Thompson at wendy.thompson@duke.edu or 684-3170. NOTE: This course requires that students complete one week of rotations at the VA Medical Center. Students must complete the required paperwork no later than 30 days prior to the first day of the section in which they are enrolled. Failure to do so may result in the student not being eligible to participate in the elective or subinternship experience. Interested visiting students must contact the Visiting Student Coordinator, steven.wilson@duke.edu, to inquire about the process for applying. *William T. Hardaker, Jr., MD and orthopaedic staff and house staff*

ORTHO-430C. ORTHOPAEDIC SPORTS MEDICINE. This elective is ideal for students interested in orthopaedic surgery, but also relevant to primary care, occupational medicine, and rehabilitation. Students participate in clinic and operating room. They learn about anatomy, pathology, physical exam, and treatment of a wide range of musculoskeletal presentations in patients from young to old, including athletes. Attendance at educational conferences is required. Students are also encouraged to participate in school physicals and game coverage to gain a full experience. For more information and to obtain a permission number, please contact Wendy Thompson at wendy.thompson@duke.edu or 684-3170. Credit: 4. Enrollment max: 1. *Permission Required. Prerequisite: Surgery 429C. Claude T. Moorman, III, MD; Grant Garrigues, MD; Richard Mather, MD; William Garrett, MD; William T. Hardaker, MD; Dean Taylor, MD; and Alison P. Toth, MD*

ORTHO-431C. HAND/UPPER EXTREMITY SURGERY. This elective is especially suitable for students interested in orthopaedic surgery, but also relevant to plastic surgery and emergency medicine. Trauma and microvascular are emphasized. Students participate in all aspects from outpatient visits to operative procedures and inpatient rounds. They also spend time in the Hand and Upper Extremity Anatomy Lab. Attendance at educational conferences is required. For more information and to obtain a permission number, please contact Wendy Thompson at wendy.thompson@duke.edu or 684-3170. Credit: 4. Permission Required. Prerequisite: Surgery 429C. Enrollment max: 1. *David Ruch, MD; Richard Goldner, MD; Fraser Leversedge, MD; and Marc Richard, MD*

ORTHO-432C. MUSCULOSKELETAL ONCOLOGY. Students gain an understanding of benign and malignant musculoskeletal neoplasms in an interdisciplinary team approach. They learn relevant anatomy, histopathology, radiology, and clinical skills related to the evaluation and management of patients from children to adults. Students participate fully in the daily activities of the orthopaedic oncology service including outpatient visits, operative procedures, and inpatient rounds. Attendance at clinical and basic science conferences is required. For more information and to obtain a permission number, please contact Wendy Thompson at wendy.thompson@duke.edu or 684-3170. Permission is Required. Prerequisite: Surgery 429C. Credit: 4. Enrollment max: 1. *Brian Brigman, MD and William Eward, DVM, MD*

ORTHO-433C. PEDIATRIC ORTHOPAEDICS. Students learn about a wide range of pediatric orthopaedic conditions from birth defects to sports injuries and fractures. Emphasis is placed on understanding the pediatric skeletal anatomy, acquisition of physical examination skills, and relating pathology to structure/function relationship in the pediatric patient. Students participate fully in all aspects of care including outpatient visits, operative procedures, and inpatient rounds. Attendance at educational conferences is required. For more information and to obtain a permission number, please contact Wendy Thompson at wendy.thompson@duke.edu or 684-3170. Permission is Required. Prerequisite: Surgery 429C. Credit: 4. Enrollment max: 1 *Robert Fitch, MD; and Robert Lark, MD*

Pathology

Chair: Richard Weiner, MD, PhD

Campus Box 3712

Phone: (919) 684-3528; Fax: (919) 684-8689

Assistant: Tamala McVey

Business Manager: Roger Searls

Department/Faculty Information: <http://pathology.mc.duke.edu/>

Second Year, Two-Week Clinical Selectives

PATHOL-220C. What Does A Pathologist Really Do? The major objective of this selective is to provide the student with answers to the following questions: a) What are the major areas that comprise the practice of pathology

and laboratory medicine)? What is Anatomic Pathology? Clinical Pathology (Laboratory Medicine)? What are the recognized sub-specialties in pathology? b) How does the pathologist function as part of the health care team? What role does a pathologist play in clinical decision making? c) If you practice Internal Medicine / Surgery / Pediatrics / Ob-Gyn / Primary Care, what can the pathologist do for you? d) What is the pathologist's role as a teacher? Students will participate in several learning experiences (1-2 days each) that involve working with faculty and residents in various sub-disciplines of pathology [e.g., surgical pathology (frozen section diagnostic service, specimen accessioning/gross descriptions service, diagnostic services), hematopathology/flow cytometry, neuropathology, dermatopathology, cytopathology/fine needle aspiration service, molecular diagnostics, cytogenetics, immunopathology/transplantation pathology, transfusion medicine, and others]. The exact set of experiences will depend on student interests, faculty availability, and number of students on the service. In each case, every attempt will be made to give the student the types of experiences that allow for fulfillment of the course objectives. Students will attend selected conferences and seminars and will meet with the course director (or representative) at least twice during the selective. The majority of learning experiences will be in the Department of Pathology at DUMC. A few are located at DVAMC and at the Franklin Park Clinical Laboratories. Enrollment Max. 4. Location: 227 MA (second floor, Davison, Duke S.) Dr. Buckley will contact students prior to the start of the selective to arrange a short (<30 min) orientation. Contact: please email Dr. Buckley at patrick.buckley@duke.edu should you have questions. *Patrick Buckley, MD/PhD*

Fourth Year Clinical Electives

PATHOL-423C. Autopsy Pathology. The course is intended to introduce students to the autopsy as an investigative tool. Anatomic-clinical correlation is emphasized. Students work directly with one or more members of the pathology department. They first view autopsies and then assist in the performance of autopsies under supervision. They work up these cases with particular attention to correlations with clinical and experimental medicine, help prepare the final autopsy reports, and work essentially at the level of a house officer. Students are expected to write up one full autopsy report for an autopsy they participated in as their final project. For more information, please contact: Meridith Hennessey, M.H.S., at meridith.hennessey@duke.edu. Credit: 4. Enrollment: max 2. *Alan Proia, MD/PhD; and Christine Hulette, MD*

PATHOL-448C. Practical Surgical and Cytopathology. This course is intended as an introduction to the practice of diagnostic surgical pathology. Clinical and morphologic aspects of disease are emphasized in rotations through the different specialty services (GI, Gyn path Hemepath, Neuropath, etc.) Students will participate (with residents and staff) in the evaluation of gross specimens, interpretations of glass slides (with ancillary studies), and the preparation of the final report. The course can be tailored to individuals planning a career in pathology or those pursuing other specialties. Rotations through the Fine Needle Aspiration and Exfoliative Cytology services can be scheduled depending on the student's interest. Please contact Dr. Bentley prior to starting rotation (684-6423) or Rex.Bentley@duke.edu. Secondary contact: Bonnie Lynch, 684-2533. Students meet on the first day at Dr. Bentley's office, M216A, Duke South, Green Zone, 2nd floor at 8:45 a.m. Credits: 4. Enrollment: max 2. *Rex Bentley, MD and staff*

Pediatrics

Ann M. Reed, MD, Chair
Campus Box 3352
Phone: (919) 681-4080; Fax: (919) 681-2714
Assistant: Stephanie Byrd
Business Manager: Susan Kline
Department/Faculty Information: <http://pediatrics.duke.edu/>

Required Courses

PEDS-205C. PEDIATRICS. The basic course in pediatrics for all students is a six-week clerkship in the second year. Its principal aim is to provide an exposure to the field of child health. The student has a varying series of experiences which should give a grasp of the concepts that underlie the discipline. Goals include acquiring familiarity and competence with the basic tools of information-gathering (history, physical examination, and laboratory data) and developing an approach to the integration of this material for the solution of problems of health and illness in infancy, childhood, and adolescence. This should be accomplished with continuing reference to the basic principles of pathophysiology encountered in the first year courses. Those patients to whom the student is assigned provide the

focus for case studies. In addition to the careful history and physical examination which must be recorded, the student is expected to organize an appropriate differential diagnosis and to seek and read pertinent reference material relevant to each patient. The student should learn to present each case verbally in an organized and succinct fashion, to follow the patient's progress, and to interpret all studies which are performed. The student is expected to learn from a number of sources: Internet accessible multimedia clinical cases, standard textbooks and journals, current publications and conferences, and also from people -- house staff, faculty, nurses, parents, and all others with whom contact is made in the clinical setting. Objectives include an understanding of the roles played in pediatrics by other members of the health care team, both in the ambulatory and hospital settings. Patient care may involve nurse, social worker, recreation therapist, psychologist, physiotherapist, dietitian, and others. The six weeks are divided to include time in several of the following settings: (a) Duke outpatient clinics and emergency room, (b) Duke inpatient, (c) Duke Regional Hospital, (d) Duke nursery, and (e) Lincoln Community Health Center. Credit: 6. *Robert Drucker, MD*

PEDS-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT) - PEDIATRICS. The basic course in pediatrics for all students is a six-week clerkship in the second year. Its principal aim is to provide an exposure to the field of child health. The student has a varying series of experiences which should give a grasp of the concepts that underlie the discipline. Goals include acquiring familiarity and competence with the basic tools of information-gathering (history, physical examination, and laboratory data) and developing an approach to the integration of this material for the solution of problems of health and illness in infancy, childhood, and adolescence. This should be accomplished with continuing reference to the basic principles of pathophysiology encountered in the first year courses. Those patients to whom the student is assigned provide the focus for case studies. In addition to the careful history and physical examination which must be recorded, the student is expected to organize an appropriate differential diagnosis and to seek and read pertinent reference material relevant to each patient. The student should learn to present each case verbally in an organized and succinct fashion, to follow the patient's progress, and to interpret all studies which are performed. The student is expected to learn from a number of sources: Internet accessible multimedia clinical cases, standard textbooks and journals, current publications and conferences, and also from people -- house staff, faculty, nurses, parents, and all others with whom contact is made in the clinical setting. Objectives include an understanding of the roles played in pediatrics by other members of the health care team, both in the ambulatory and hospital settings. Patient care may involve nurse, social worker, recreation therapist, psychologist, physiotherapist, dietitian, and others. The six weeks are divided to include time in several of the following settings: (a) Duke outpatient clinics and emergency room, (b) Duke inpatient, (c) Duke Regional Hospital, (d) Duke nursery, and (e) Lincoln Community Health Center. Credit: 6. *Robert Drucker, MD*

Second Year, Two-Week Clinical Selectives

PEDS-220C. CLINICAL GENETICS AND METABOLISM. The students will join the clinical genetics and metabolism service for DUMC and participate in all the activities of the team - outpatient clinics, inpatient consults, case conferences and didactic presentations. They will perform history-taking, pedigree construction, physical examination (including dysmorphology assessment) and construct a differential diagnosis using reading materials, internet resources and databases. They will observe genetic counseling sessions. Credit: 2. Enrollment Max. 2. Location: Genetics Clinic in Children's Health Ctr. In workroom beside exam rooms 10 & 11. Meet promptly at 8:30am on Monday morning in the genetics clinic CHC, Level 2. Contact Dr. Marie McDonald for more information. *Marie McDonald, MD*

PEDS-221C. CHILD ABUSE AND FAMILY VIOLENCE. This selective provides students the opportunity to learn about child abuse and family violence, the effect of these issues on individual health needs of patients, the impact of these issues on public health, and the role of the physician to address these issues. Students will participate in the evaluation of patients in an outpatient medical child abuse clinic, observe inpatient child abuse consults, observe family based interventions, observe court proceedings, and participate in mental health didactics. Students will choose a topic in child abuse or family violence for further study and present their findings to the Child Abuse Consult team. This selective is appropriate for all students interested in learning more about family violence in adult or pediatric clinical medicine and/or public health. Credit: 2. Enrollment Max. 1. Location: Duke Children's Primary Care Clinic, 4020 N. Roxboro Road, Durham, NC 27704. For more information and the meeting time, please contact Mr. Scott Snider, Clinical Coordinator, at 919-479-2690 or scott.snider@duke.edu. *Aditee Pradhan Narayan, MD and Karen St. Claire, MD*

PEDS-222C. OVERVIEW OF PEDIATRIC HEMATOLOGY-ONCOLOGY. This selective will be offered through the Division of Pediatric Hematology-Oncology within the Department of Pediatrics. During the two week

course, students will experience an overview of pediatric hematology-oncology. Students will be expected participate in outpatient care provided in the Children's Health Center. Students who chose, may round with the inpatient PHO team a few mornings during the second week of the rotation. Students also will be asked to attend conferences, including patient care conferences, psychosocial rounds, and didactic conferences. In addition, students will meet with individual faculty and staff members daily in clinic to discuss specific topics including: sickle cell disease, anemia, leukemia, lymphoma, solid tumors and disorders of the coagulation system as well as psychosocial and ethical issues based on the patients evaluated in clinic each day. Credit: 2. Enrollment Max. 1. Location: Hanes House, Room 382. Mailing box number: 102382. Contact: For more information please contact Susan Kreissman, M.D., at 684-3401 or via email susan.kreissman@duke.edu. *Susan Kreissman, MD*

PEDS-223C. PEDIATRIC INTENSIVE CARE UNIT. This advanced course is designed to allow students a two-week experience in the Pediatric Intensive Care Unit (PICU). Under the supervision of faculty attendings, fellows, and residents, students participate in the care of critically ill children admitted to the PICU for multidisciplinary care. Emphasis is placed on the development of the pathophysiologic approach to the diagnosis and treatment of a broad spectrum of pediatric illnesses as they present in acute care settings. Advanced concepts in pediatric critical care are emphasized. Credit: 2. Enrollment: max 1. Location: Meet on first day in the PICU (5600 Duke North) at 7:20 am and report to the post-call fellow to join/observe rounds on day 1. Contact: Students are asked to contact Dr. Kyle Rehder by email one week in advance of their selective. **PREREQUISITE:** Students must have successfully completed the required second year Pediatrics clerkship in order to enroll in this two-week selective. *Kyle Rehder, MD; Ira Cheifetz, MD; Caroline Ozment, MD; Stacey Peterson-Carmichael, MD; Rebecca Smith, MD; David Turner, MD; Kevin Watt, MD; and B. Craig Weldon, MD*

PEDS-224C. DEVELOPMENTAL CARE OF SICK NEWBORNS-A MULTIDISCIPLINARY APPROACH. This selective will introduce the student to the more “general pediatric” aspect of neonatology, including complex convalescent medical and developmental care, as well as promote the importance of teamwork in caring for premature and sick babies. Students will gain an appreciation of the importance of a well-coordinated hospital discharge and early intervention services, both in the hospital and after discharge for high-risk infants. They will participate in the activities of the medical and developmental team in the intensive care and transitional care nurseries and learn the important role played by psychologists, therapists and social workers in caring for these infants and their families. They will attend developmental/discharge planning rounds, Special Infant Care Clinic and shadow members of the developmental team. Credit: 2. Enrollment Max. 2. Location: Contact Dr. Malcolm (william.malcolm@duke.edu) or Dr. Ashley (ashle022@mc.duke.edu) for more information. *William Malcolm, MD and Patricia Ashley, MD/PhD*

PEDS-226C. PEDIATRIC NEUROLOGY. Students will partake in the evaluation and management of both hospitalized and ambulatory pediatric patients with neurological disorders. Emphasis is placed on the neurodevelopmental history, neurological examination, the use of laboratory tests and radiological tools and pharmacotherapy in the diagnosis and management of childhood neurological disorders. Students will also attend and participate in conferences, including pediatric neurology conference, pediatric neuroradiology conference, and neuroscience core curriculum. For more information please contact Kristin Johnson via email at kristin.t.johnson@dm.duke.edu or Lindsay Johnson at lindsay.m.johnson@duke.edu. Credit 2. Max 1. *Mobamad Mikati, MD*

PEDS-227C. ADOLESCENT MEDICINE. This selective will provide medical students with an introductory experience in the care of adolescents and young adults. This realm of care encompasses a unique blend of acute care, chronic disease management, prevention, and consultative assessments. A distinct priority is placed on effective interpersonal interactions, patient-centered interviewing, and patient education and counseling. Adolescent Medicine by nature is exquisitely multi-disciplinary, and this selective will provide students with a view into the intricacies of such interdisciplinary care across a variety of outpatient settings. Clinical experiences will be complemented by case-based didactic sessions, supervised reading, and a focused academic project. Credit: 2. Enrollment Max: 1. Location: Duke Health Center at Roxboro Street, 4020 N. Roxboro Street. Contact Dr. Chung for more information at richard.chung@dm.duke.edu. *Richard J. Chung, MD; Nirmish Shab, MD; John Moses Jr., MD; Betty Staples, MD; Gary Maslow, MD; Deborah Squire, MD.*

PEDS-228C. PEDIATRIC GASTROENTEROLOGY. This course offers an excellent clinical and endoscopic exposure in the field of pediatric gastroenterology with significant opportunity for one to one interaction with the pediatric GI faculty. The student spend majority of the time in the outpatient setting and the interested student will be exposed to the inpatient setting. For more information, please call Dr. Venkat 684-5068. Administrative contact

is Cheryl Chervinko, 919-684-4831 or Annette Bramucci at 919-668-2577. Enrollment Max. 1; Credit: 2. Note: Students that take this selective may not take the four week elective, PEDS 402C. *Narayanan Venkatasubramani, MD/MRCPH/MBBS; Nancy McGreal, MD; Richard Noel, MD/PhD; Leon Reinstein, MD; Megan Butler, MD*

Fourth Year Clinical Electives

PEDS-401C. PEDIATRIC SUBINTERNSHIP. This course is designed to provide the student with an intensive, in-depth exposure to the diagnosis and management of pediatric patients hospitalized at Duke. Students are responsible for admission histories, physical examinations, and management throughout the hospitalization. The student serves as an acting intern throughout the rotation. This is a sole-enrollment course and cannot be taken in conjunction with any other course. Students must obtain the permission of Dr. Mikelle Key-Solle to register for or to drop this course. Students are expected to contact the daytime supervisory resident prior to the start of the sub-internship to arrange the meeting place on the first day. Prior to the start of the sub-internship the name of the contact supervisory resident will be provided to the students. Students should meet promptly at 7:00am on the first day. Meeting schedules for other days will depend on rounding schedule and days off. Credit: 5. Enrollment: max: 4. *Mikelle Key-Solle, MD; Robert Drucker, MD and faculty*

PEDS-402C. PEDIATRIC GASTROENTEROLOGY. This course offers an excellent clinical and endoscopic exposure in the field of pediatric gastroenterology with significant opportunity for one to one interaction with the pediatric GI faculty. The student spend majority of the time in the outpatient setting and the interested student will be exposed to the inpatient setting. For more information, please call Dr. Venkat 684-5068. Administrative contact is Cheryl Chervinko, 919-684-4831 or Annette Bramucci at 919-668-2577. Enrollment Max: 1; Credit: 2-4. Note: Students that have previously taken the two-week selective, PEDS 228C, are not eligible to enroll in PEDS 402C. *Narayan Venkatasubramani, MD/MRCPH/ MBBS; Richard Noel, MD/PhD; Leon Reinstein, MD; Megan Butler, MD*

PEDS-410C. ADVANCED PEDIATRICS. This course permits the student to elect an in-depth experience within pediatrics. Each student has a specific faculty preceptor who develops and implements the curriculum tailored to the individual's needs. Listed below are the faculty representatives to contact. Arrangements for the elective must be made with these individuals prior to enrolling in the course. The name of the preceptor with whom a student is working must be designated during web registration. Credit: 2 to 4. Enrollment: max 1 per section. (B) Gastroenterology - Narayanan Venkatasubramani, M.D. 919-684-9201, n.venkat@duke.edu; (C) Pulmonary -Richard Kravitz, M.D. 684-2289 (D)Rheumatology - Jeffrey Dvergsten, M.D. 684-6575. *Students may contact Dr. Drucker with any questions at robert.drucker@duke.edu. Robert Drucker, MD and selected departmental representatives*

PEDS-411C. PEDIATRIC EMERGENCY MEDICINE. The 4th year elective in Pediatric Emergency Medicine is designed to enhance the medical student's learning by allowing the student to develop a proficient and rational approach to the sick pediatric patient. The student will become familiar with the rapid assessment of ill patients and the development of a knowledge base and technical skills allowing for the management of pediatric emergencies. Also, the student will learn how to prioritize patient care, to recognize patients requiring emergent interventions, and to decide which patients need admission or outpatient care. By the end of the rotation, the student will be capable of obtaining an appropriate problem-oriented history and physical, creating a differential diagnosis based on available information, and developing an appropriate management plan. Students will be contacted by Dr. Fox via email approximately 2 weeks prior to the start date of their rotation with orientation materials. Prompt reply to this email is expected as time-sensitive information will be included. Students are to report to the Pediatric Emergency Department at Duke Medical Center at the time of his/her first scheduled shift. Students will be expected to work four 8-hour shifts per credit. Students are expected to attend required didactic sessions during the entire 4-week block, even if scheduled for fewer than 4 credits. Required didactics include a suture workshop (typically the first Monday morning of the rotation) and pediatric topics on variable Thursday mornings. If students are unable to attend these sessions, additional assignments must be completed in order to pass the rotation. Schedule requests for time away must be cleared by the elective course director FOUR weeks before the start date of the rotation. Permission of the instructor is required for enrollment. Requests to drop the course must be approved at least FOUR weeks prior to the start of the scheduled rotation. Failure to do so may result in a failing grade for the course. Please contact Dr. James Fox (course director) for questions. NOTE: It is sometimes possible that the course director may be able to accommodate an additional student for any single term. If the course is shown as "full" in ACES and you are interested, you are encouraged to contact Dr. Fox to inquire. Variable Credit: 2-4 cr. Enrollment Max: 2; (variable credit enrollments may impact enrollment limits). *James Fox, MD; William Bordley, MD; Donald Ellis, MD; and Linton Yee, MD*

PEDS-421C. PEDIATRIC INFECTIOUS DISEASES. This course provides experience in the clinical and laboratory diagnosis of infectious diseases and in their therapy. The student works closely with the infectious disease fellow and attending, participating actively in evaluation of patients in both the inpatient and outpatient setting. For more information, please call Dr. Drucker at 684-2356. Secondary contact: Dr. Cunningham, 684-6335. Administrative contact is Kristin Johnson, 681-4658, (kristin.t.johnson@dm.duke.edu). Students should meet on the first day at Dr. Drucker's Office T0919, Children's Health Center) at 8:00 a.m. Peds ID fellow page: 970-7420. Credit: 2 to 4. Enrollment: max 2. *Robert Drucker, MD; Danny Benjamin, MD; Colleen Cunningham, MD; Kathleen McGann, MD; Ross McKinney, MD; M. Anthony Moody, MD; Sallie Permar MD/PhD; Patrick Seed, MD/PhD; William J. Steinbach, MD, and Michael Cohen-Wolkowicz MD*

PEDS-425C. ENDOCRINE DISORDERS IN CHILDREN. Students attend in the Pediatric Endocrine, Diabetes, and Insulin Resistance/Obesity Clinics and assume active roles in the evaluation and management of in-patients admitted to the Endocrine Service. Emphasis is placed upon the evaluation of several endocrine issues, including diabetes diagnosis and management, growth and sexual development, thyroid disorders, pituitary disorders, and calcium and vitamin D disorders. Students also participate in a monthly endocrine journal club and in weekly intra- and interdepartmental endocrine clinical and research conferences. Students will make a presentation to the endocrine group at the end of the rotation. Students will start the rotation at Lenox Baker Hospital on their first Monday, at 9AM. They should email Dr. Robert Benjamin, course director, to confirm this the week prior to their rotation. His contact email is robert.benjamin@duke.edu. Credit: 1 to 8. Enrollment: max 2. *Robert Benjamin, MD; Michael Freemark, MD; Deanna Adkins, MD; Nancy Friedman, MD; Nancie J. MacIver, MD/PhD; and Dorothee K.D. Newbern, MD*

PEDS-426C. NEONATOLOGY. Students have patient care responsibilities as well as exposure to a broad range of clinical problems in the Duke Intensive Care Nursery. The course involves direct participation in patient care under the supervision of the faculty and house staff. Emphasis is placed understanding the pathophysiologic approach to the assessment and management of the critically ill neonate, with special emphasis on ethical and psychosocial issues surrounding their care. This is a sole-enrollment course and, as such, cannot be taken in conjunction with any other course. Prerequisite: PEDS and contact Dr. Susan Izatt at susan.izatt@dm.duke.edu or by phone at 919-681-6024. Secondary contact: Dr. Ronald Goldberg, 681-6024. Students are to meet on the first day at the Neonatal Intensive Care Unit, Duke North, 5th floor. Meet promptly at 7:00 a.m. The course director will contact the student prior to the start date to clarify meeting location, attending service, and additional information. Credit: 5. Enrollment: max 1. *Susan Izatt, MD; Ronald Goldberg, MD; Richard Auten, MD; Eric Benner, MD/PhD; Margarita Bidegain, MD; C. Michael Cotten, MD; Jeffrey Ferranti, MD/MS; Ricki Goldstein, MD; Robert Lenfestey, MD; Brian Smith, MD; and David Tanaka, MD*

PEDS-427C. PEDIATRIC HEMATOLOGY /ONCOLOGY. This course includes all aspects of clinical and laboratory hematology (with a focus on sickle cell disorders) as well as the diagnostic evaluation, care, and treatment of patients with malignant diseases (childhood leukemia, lymphoma, osteosarcoma, neuroblastoma, Wilm's tumor). Emphasis is placed on fundamental concepts of pediatric hematology/oncology. Students will accompany the inpatient team on the ward rounds for 1 - 2 weeks of the rotation, depending upon student interest and discussions with course director, with the remaining time spent in the clinic evaluating new patients and seeing established patients. Students also are expected to attend divisional teaching conferences. Students will be asked to research a specific topic and deliver a short presentation at the end of their rotation. Location: Hanes House, room 382; Box number 102382. For more information please call Deb Lasater at 684-3829 or Dr. Kreissman via email at kreis001@mc.duke.edu. Prerequisite: contact instructor. Credit: 4. Enrollment: max 1. *Susan Kreissman, MD; Michael Armstrong, MD/PhD; Ray Barfield, MD/PhD, Oren Becher, MD; Sri Gururangan, MB CHB; Jessica Heath, MD; Corinne Linardic MD/PhD; Philip Rosoff, MD; Jennifer Rothman MD; Nirmish Shah MD, Jessica Sun MD; David Van Mater, MD/PhD; and Daniel Wechsler, MD/PhD*

PEDS-430C. HEALTHY LIFESTYLES PROGRAM: A CLINICAL, FAMILY-BASED APPROACH TO PEDIATRIC OBESITY. Comprehensive outpatient treatment for childhood obesity. Through observed and direct interactions with families, children and adolescents in an outpatient clinical setting, students will learn the causes and complications of pediatric obesity, and the approach to management. The team of health professionals students will interact with and observe include pediatricians, nutritionists, physical therapists and mental health providers. Students are expected to attend clinic Monday through Friday, according to a calendar which will be provided by the course director at the start of the rotation. Students will complete training and certification in motivational inter-

viewing, an evidence-based communication technique to achieve effective behavior change. Students will be expected to participate actively in weekly noon team learning seminar (day TBA) and to present a topic of the student's choice near the end of the rotation. Lastly, the course director will provide students with a reading list on pertinent topics to be completed by the end of the rotation and discussed with course director during final feedback session. Report to Duke Children's Primary Care Clinic, 4020 Roxboro Road, second level. Students will be required to participate in a community fitness program for children, called Bull City Fit, one evening per week. Students will play games, sports, and participate in cooking classes or other events with families. From this experience, students will gain an understanding of community engagement, health advocacy and program planning. For questions, email Dr. Bailey at michelle.bailey@duke.edu. Credit: 4. Enrollment: max. 1. *Michelle Bailey, MD; Sarah Armstrong, MD; Caren Mangarelli, MD; Martha Nelson, PA-c; Jenny Favret, LDN, RD; Andrea Hartzell, PT; and Meryl Kanfer, LCSW*

PEDS-431C. CLINICAL PEDIATRIC CARDIOLOGY. This Medical Student rotation provides a learning experience in the clinical diagnosis and management of heart disease in children. The student will have the opportunity to see and participate in the management of children referred for cardiology evaluation or follow-up via clinic or consultation. There are also experiences observing cardiovascular procedures in the Pediatric Cardiac Catheterization Laboratory, the Pediatric Echocardiography Laboratory and the operating room. There is the option to attend clinic in the Raleigh office as well as the clinic at the Children's Health Center. The emphasis is placed upon outpatient management, but there is the option of attending inpatient rounds in the cardiac intensive care unit if desired. Scope: history, physical examination, and special diagnostic techniques (echocardiography, electrocardiography, cardiac catheterization and cineangiography). Students participate in outpatient clinics five days per week as well as weekly cardiology/cardiovascular surgery conference. Prerequisite: PEDS 205C. For more information please call the course director, Dr. Stephanie Wechsler, at 919-684-3574 or by email, stephanie.wechsler@duke.edu. Secondary Contact: Dr. Michael J. Campbell, 919-684-3574 or michael.campbell2@duke.edu. Credit: 4. Enrollment: max 1. *Stephanie Burns Wechsler, MD; Other faculty: Brenda Armstrong, MD; Piers C.A. Barker, MD; Michael G.W. Camitta, MD; Michael J. Campbell, MD; Michel P. Carboni, MD; Greg Fleming, MD; Heather Henderson, MD; Kevin Hill, MD; Salim F. Idriss, MD/PhD; Ronald Kanter, MD; Jennifer S. Li, MD; Angelo Milazzo, MD; Stephen Miller, MD; Sara Pasquali, MD; John Rhodes, MD; and Greg Tatum, MD*

PEDS-433C. ALLERGY AND CLINICAL IMMUNOLOGY. Clinical appraisal and practice in use of methods of diagnosis and treatment of allergic and immunologic disorders including the atopic diseases, immunologic deficiency states, and bone marrow transplantation. Scope: in-depth seminars, history, physical examination, skin testing, a variety of clinical immunologic tests, and Clinical Research Unit experience. For more information please contact Dr. Roberts via email at joseph.roberts@dm.duke.edu. Alternate contact: Debra Preddy, email debra.preddy@dm.duke.edu. Students meet on the first day at 8:30 a.m. on the 4th floor, CHC - Allergy and Immunology Clinic. Credit: 4. Enrollment: max 2. *Joseph L. Roberts, MD/PhD; Rebecca Buckley, MD; Ivan Chinn, MD; Michael Frank, MD; and M. Louise Markert, MD/PhD*

PEDS-434C. CLINICAL GENETICS/ METABOLISM. The student becomes familiar with evaluation and management of various genetic disorders including malformation syndromes and biochemical disorders. History-taking, pedigree construction and analysis, specialized aspects of the dysmorphological physical examination, diagnostic techniques, routine and specialized laboratory methods (cytogenetic, biochemical, molecular), and reference materials (texts and computer programs) are covered. Students participate in weekly teaching and clinical conferences. For more information please call 684-2036. First Day of Classes: Students should meet at the Genetics Clinic at 8:00 a.m., CHC level 2, Room 2924A. Credit: 4. Enrollment: max 2. *Marie McDonald, MD*

PEDS-436C. PEDIATRIC NEUROLOGY. Students will partake in the evaluation and management of both hospitalized and ambulatory pediatric patients with neurological disorders. Emphasis is placed on the neurodevelopmental history, neurological examination, the use of laboratory tests and radiological tools and pharmacotherapy in the diagnosis and management of childhood neurological disorders. Administrative contacts: Kristin Johnson(kristin.johnson@dm.duke.edu) at 681-4658. Students should report to the PEDS Neuro office in the CHC room T0913. Please meet promptly at 8:00 a.m. Prerequisite: contact Dr. Gallentine at 668-0477. Credit: 4. Enrollment: max 2. *William Gallentine, DO*

PEDS-440C. ADVANCED GENERAL PEDIATRICS-INTENSIVE CARE. This advanced course is designed to allow students a four-week experience in the Pediatric Intensive Care Unit (PICU). Clinically, students will first have a several day period of shadowing non-physician ICU staff (RNs, RTs, SWs), followed by several weeks of participating in the physician team caring for PICU patients. Overnight and weekend call is not expected. Academically,

students are asked to choose among several projects (oral or written case presentation or critical appraisal of a published study) to be completed by the end of the rotation. Emphasis is placed on the development of the patho-physiologic approach to the diagnosis and therapy of a broad spectrum of pediatric illnesses as they present in acute care settings. Prerequisite: PEDS 205C. Credit: 4. Enrollment: max 1. For more information, please contact Dr. Rehder via email at kyle.rehder@duke.edu. Dr. Rehder can also be paged at 970-7195, or if unable to reach Dr. Rehder, you may contact Veronica Mills at 681-3550. *Kyle Rehder, MD; Ira Cbeifetz, MD; Stacey Peterson-Carmichael, MD; Rebecca Smith, MD; David Turner, MD; and Craig Weldon, MD*

PEDS-441C. PEDIATRIC NEPHROLOGY. Students actively participate in assigned patient care, and prepare didactic presentations as a part of instruction. Clinical work provides the students with exposure to clinical nephrology and basic renal physiology. The course will provide experience in diagnosis, interpretations of laboratory tests, natural history, and treatment of acute and chronic disorders of the kidney in children. The student will participate in the management of fluid and electrolyte disorders in infants and children. Consultative services are provided for inpatients and outpatients from general and subspecialty disciplines in pediatrics, intensive care units, and the transplant services. For more information, please contact Dr. Wigfall at 684-4246 or via email at wigfa001@mc.duke.edu or Dr. Foreman at forem001@mc.duke.edu. Credit: 4. Enrollment: max 1. *Delbert Wigfall, MD; R. Gbadegesin, MD; Shashi Nagaraj, MD/MBBS; and John Foreman, MD*

PEDS-446C. PEDIATRIC STEM CELL TRANSPLANT UNIT. This four week elective is designed to give medical students experience in all aspects of clinical hematopoietic stem cell transplantation including the diagnostic evaluation, care, and treatment of transplant patients. Emphasis is placed on fundamental concepts of hematopoietic stem cell transplantation. Students will accompany the inpatient team on the ward rounds for 3 weeks of the rotation with the remaining time spent in the clinic evaluating new patients and seeing established patients. Students also are expected to attend divisional teaching conferences and give informal presentations on topics in hematopoietic stem cell transplantation. Students should join the Division meeting on Monday at 8:00 a.m. in the Division offices on the first floor of the Old Duke Credit Union (1400 Morreene Rd) on the first day of classes. For more information, please contact Dr. Martin at paul.martin@duke.edu, or pager, 970-3758. Secondary contact: Tim Driscoll, 668-1120. Credit: 4. Enrollment: max 2. *Paul Martin, MD/PhD; Joanne Kurtzberg, MD; Tim Driscoll, MD; Subag Parikh, MD; Vinod Prasad, MD; and Kristin Page, MD*

Psychiatry

Richard Weiner, MD, PhD, Interim Chair

Campus Box 3950

Phone: (919) 684-5616; Fax: (919) 681-5489

Assistant: Lynette Blackwell Williams

Business Manager: Brian Spector

Department/Faculty Information: <http://psychiatry.mc.duke.edu/>

Required Courses

PSYCHTRY-205C. PSYCHIATRY. This course is a required four-week clerkship in clinical psychiatry for second year medical students. Students assume limited responsibility with supervision for the diagnosis and treatment of patients with common and severe psychiatric illnesses. Educational settings include inpatient psychiatry services at four different hospitals, psychiatry outpatient clinics, and the psychiatry emergency rooms of two hospitals. Students participate in a series of core didactic lectures and didactic modules which expose them to basic psychopathologic entities, differential diagnosis of psychiatric symptoms, practical application of treatment modalities, and issues of cost effectiveness in diagnosis and treatment. Students also participate in lectures, rounds, and clinical case conferences particular to their rotation site. Students are encouraged to observe psychotherapy and to participate in supervised psychological treatments wherever appropriate opportunities can be provided. Secondary Contact: Phillis Scott (phillis.scott@duke.edu). Credit: 4. *Shelley Holmer, MD*

PSYCHTRY-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT) - PSYCHIATRY. This course is a required four-week clerkship in clinical psychiatry for second year medical students. Students assume limited responsibility with supervision for the diagnosis and treatment of patients with common and severe psychiatric illnesses. Educational settings include inpatient psychiatry services at four different hospitals, psychiatry outpatient clinics, and the psychiatry emergency rooms of two hospitals. Students participate in a series of core didactic lectures and didactic modules which expose them to basic psychopathologic entities, differential diagnosis of psychiatric

symptoms, practical application of treatment modalities, and issues of cost effectiveness in diagnosis and treatment. Students also participate in lectures, rounds, and clinical case conferences particular to their rotation site. Students are encouraged to observe psychotherapy and to participate in supervised psychological treatments wherever appropriate opportunities can be provided. Credit: 4. *Shelley Holmer, MD*

Second Year, Two-Week Selectives

PSYCHTRY-220C. ADDICTION PSYCHIATRY. Students are exposed to the multidisciplinary, biopsychosocial evaluation and treatment of individuals with substance use disorders, including abuse and dependence involving alcohol, tobacco, illicit drugs and prescription medications. Students encounter patients engaged in the process of active, ongoing recovery from addictions, employing individual and group therapies, pharmacotherapy, and self-help groups. They are exposed to the assessment and management of patients with co-morbid psychiatric disorders and addiction. Assigned readings address epidemiology, neurobiology, and clinical management of addictions. Enrollment Max. 1. Meeting time: Promptly at 8:30 a.m. Meeting location for first day: VA Substance Abuse Outpatient Program; VA Hillandale II Clinic; 1830 Hillandale Road, Durham, NC 27705. For more information, please contact: Dr. Roy Stein by email, roy.stein@duke.edu. *Roy Stein, MD* - NOT CURRENTLY OFFERED

PSYCHTRY-221C. CLINICAL INTRO TO CHILD PSYCHIATRY. This two-week course will be an opportunity to observe and learn about the specialty of child psychiatry. A series of clinical experiences with children and adolescents who are experiencing mental health problems and disorders will be offered in both an outpatient and inpatient setting. Medical Students will have opportunities to observe comprehensive evaluations, consultations, and treatments. Participation in a weekly Evidence Based Medicine seminar and didactic sessions in child psychopathology will be included. Enrollment Max. 2. Location: Child and Adolescent Unit at Central Regional Hospital in Butner, NC - 8:15 a.m. Orientation with Dr. Allsbrook. For more information, please contact Dr. Gary Maslow(gary.maslow@duke.edu) *Gary Maslow, MD*

PSYCHTRY-222C. GERIATRIC PSYCHIATRY. Objective: To provide exposure to the psychiatric care of geriatric patients. Students will rotate in a variety of inpatient/ outpatient/ consultation settings including memory disorders clinic, outpatient geriatric psychiatry clinic at Duke, inpatient unit at Central Regional Hospital, VA geropsychiatry clinic, and Geriatric Evaluation and Treatment Clinic. Students will learn about comprehensive psychiatric evaluation of older patients with a variety of psychiatric diagnoses including mood disorders, dementia, psychotic disorders, and personality disorders, usually in the context of significant medical co-morbidity. Students will also learn the bio-psycho-social approach to managing various disorders. Students will participate in ongoing weekly didactic seminars and journal club. Enrollment Max. 2. Location: Please email Dr. Holsinger via email, tracey.holsinger@va.gov for location and more information: mugdha.thakur@duke.edu. *Tracey Holsinger, MD*

Fourth Year Clinical Electives

PSYCHTRY-401C. SUBINTERNSHIP IN PSYCHIATRY. This course is an intensive clinical experience in the diagnosis and treatment of severe and incapacitating psychiatric disorders. The student is given more clinical responsibility than the comparable second year inpatient rotation. Patient care responsibilities include management of ward milieu. Treatment approaches emphasizing psychotropic medication, individual, and family psychotherapy are part of the clinical experience. Participation at patient care conferences and didactic lectures is expected. Call is taken every 5th night. The rotation is only available at Duke on the Williams Ward. For more information, please contact Dr. Shelley Holmer via email at shelley.holmer@duke.edu. Please meet on Williams Ward, Duke South at 8:30 AM on the first day. Additional first day training will be provided. Prerequisites: instructor approval and satisfactory completion of PSC-205C (or equivalent for visiting students). Secondary contact: Dawn Faust, email at dawn.faust@duke.edu or phone at 684-4079. Credit: 5. Enrollment: max 1. *Shelley Holmer, MD*

PSYCHTRY-407C. SUBINTERNSHIP IN INTERNAL MEDICINE-PSYCHIATRY. This course is an intensive clinical experience in the diagnosis and treatment of acute co-morbid medical and psychiatric disorders requiring acute hospitalization. Students participating in this four-week elective based in Duke North Hospital are expected to function at intern-level, assuming care of a small census of complex patients. The Medicine/Psychiatry faculty on the GenMed 12 service provides direct supervision. The goal of the elective is to refine and then clinically apply basic knowledge from the fields of Internal Medicine and Psychiatry. Participation at selected case conferences and didactic sessions is expected. Students are invited to attend the intern lecture series during Psychiatry Academic Half-day and educational offerings in Internal Medicine, including Intern Report. Call is taken in both Medicine and Psychiatry in alternating fashion every fifth night. For more information, please contact Dr. Sarah Rivelli via email,

sarah.rivelli@duke.edu or 668-0207. Preference is given to students considering a career in combined Medicine-Psychiatry. Prerequisite: permission of instructor and successful completion of PSYCHTRY-205C and MEDICINE-205C. C-L MEDICINE 407C. Credit: 5. Enrollment: max 1. *Sarah Rivelli, MD*

PSYCHTRY-435C. MODERN PSYCHOTHERAPY: INTENSIVE CLINICAL INTRODUCTION. In this full-time (or near full-time) introduction, the student participates actively in assessment of inpatients and outpatients for psychotherapy including short-term psychotherapy of inpatients, ongoing psychotherapy groups, and family therapy sessions. In addition he/she attends seminars on the various psychotherapeutic approaches: psychoanalytically oriented, cognitive, behavioral, interpersonal, systemic, etc. Readings are assigned and discussed. The student may pursue an area of special interest in greater depth with a selected preceptor. Permission of instructor is required to elect the course at any time other than section 41 of the fall term. For more information please contact Dr. Haresh Tharwani at 684-0275 or via email at haresh.tharwani@duke.edu. Credit: 4. Enrollment: max. 1. Prerequisites: Satisfactory completion of PSYCHTRY-205C. *Haresh Tharwani, MD*

PSYCHTRY-443C. ADDICTION PSYCHIATRY. Students are exposed to a spectrum of settings for treatment of substance use disorders. Students are based at the Durham VA Medical Center Substance Abuse Outpatient Program, with additional experience at other Duke-affiliated inpatient and outpatient facilities. Emphasis is placed on understanding the relationships between addictive disorders and other psychiatric and medical conditions. Experiences include diagnostic evaluation, pharmacological management, and individual, group, and family psychotherapy. Students function as members of the multidisciplinary treatment team at the Durham VA Medical Center program. For more information and for approval, please contact Dr. Roy Stein at 286-0411 or via email at stein001@mc.duke.edu. Credit: 4. Enrollment max 1. Prerequisites: instructor approval at least 4 weeks in advance and satisfactory completion of PSYCHTRY 205C. *Roy Stein, MD and Daniel Bradford, MD*

PSYCHTRY-445C. CONSULTATION-LIAISON PSYCHIATRY. The Psychiatry Consultation-Liaison Service at Duke Medical Center offers a clinical clerkship in the evaluation and management of psychiatric disorders in the medical and surgical setting. The student performs psychiatric consultations for medical and surgical services under direct supervision of residents and senior staff. Topics in psychosomatic medicine, psychopharmacology and medico-legal issues are discussed. Unique issues in psychiatric presentations of medical illness and adaptation to illness are reviewed. Students may attend an outpatient psychiatric consultation clinic in addition, upon request and pending availability. Students attend the weekly MedPsych conference and Psychiatry Academic Half-day educational offerings. Hours are 8am-6pm M-F. Call the consult pager to arrange meeting place on first day (970-PSYC). Students need to check with Dr. Rivelli in advance via email at sarah.rivelli@duke.edu to confirm the availability of this rotation. Prerequisites: instructor approval and satisfactory completion of PSC-205C. Credit: 4. Enrollment: max 1. *Sarah Rivelli, MD*

Radiation Oncology

Christopher G. Willet, MD

Campus Box 3085

Phone: (919) 668-5640; Fax: (919) 668-7345

Assistant: Donna Wimberley

Business Manager: Terry Brewer

Department/Faculty Information: <http://radonc.duke.edu>

Second Year, Two-Week Selectives

RADONC-220C. BRIEF EXP. IN CLINICAL RADIATION/ONCOLOGY. Radiation therapy plays an important role in the care of patients with cancer. Students will begin this course with an orientation lecture, review of an educational syllabus, and several audio-visual educational programs. This will be followed by clinical instruction in the ambulatory clinics of the radiation oncology department at Duke. Students will have an opportunity to observe/participate in the evaluation, treatment planning, and care of patients before, during, and after their radiation. Credit: 2. Enrollment Max. 3. Location: Room 05121A Basement level, Morris Clinic. Meet promptly at 8:00 a.m. For more information, please contact Bette Walker at 668-7432. *Nicole Larrier, MD*

Fourth Year Clinical Electives

RADONC-415C. CLINICAL RADIATION ONCOLOGY. Radiation oncology plays a crucial role in the management of patients with cancer. The student begins this course with lectures, individual tutorials, and audio-

visual education programs to review the crucial elements of radiation biology, medical radiation physics, and dosimetry. This is followed by clinical instruction based in the ambulatory clinics of the Radiation Oncology Department as well as participation in brachytherapy procedures, care of inpatients, and new patient consultations. This course provides an introduction to the role of radiation therapy in the treatment of malignant disease. For more information please contact Dr. Larrier at 668-7342 or via email at larri003@mc.duke.edu. Secondary contact: Bette W. Clack, email, walke098@mc.duke.edu or phone, 668-6693. NOTE: This elective does require student to complete rotations at the VA Medical Center. Students applying for this rotation MUST complete all VA paperwork no later than one month prior to the first day of classes. Students should report to Room 005113 [Sub-basement, White Zone, Duke Clinic] at 7:45am on the first day of the rotation. Credit: 4. Enrollment: max 2. *Nicole Larrier, MD and staff*

Radiology

Chair: Erik Paulson, MD

Campus Box 3808

Phone: (919) 684-7293; Fax: (919) 613-5716

Assistant: Maria Nelson

Business Manager: John Dion

Department/Faculty Information: <http://radiology.duke.edu/>

Second Year, Two-Week Selective

RADIOL-205C. RADIOLOGY. The core clerkship in Radiology will emphasize evidenced-based strategies for optimized utilization of imaging, teach diagnostic skills for the interpretation of medical images, and provide an understanding of the costs (financial and health risks), benefits, and signature characteristics of radiography, computed, tomography, magnetic resonance, sonography, angiography, fluoroscopy, and nuclear medicine as applied in routine clinical care across the disciplines of abdominal, breast, cardiothoracic, neurological, musculoskeletal, pediatric, and interventional radiology and nuclear medicine. Students will learn basic principles of image acquisition, working in the Department of Radiology and will be taught normal and both common and emergent abnormal imaging findings. Credits: 4. Course Director: *Caroline Carrico, MD*, Co-Director: *Phil Goodman, MD*.

RADIOL-221C. RADIOGRAPHIC ANATOMY. This selective is designed to introduce students to pertinent radiologic anatomy. Students will be exposed to different imaging modalities in radiology, and radiographic anatomy in the form of unknowns presented as online teaching modules. The goal for students is to understand relevant anatomy for radiology. Proficiency will be measured by a short quiz at the conclusion of the modules. Credit: 2. Enrollment Max. 14, Min 1; Location: Department of Radiology, Duke North. Contact: For more information concerning the course of the meeting location and time for the first day, please contact Ms. Brantley at brant003@mc.duke.edu. or Caroline Carrico, MD at carri026@mc.duke.edu . *Caroline Carrico, MD* – NOT CURRENTLY OFFERED

Fourth Year Clinical Electives

RADIOL-402C. BREAST IMAGING. The 4th year elective in Breast Imaging is designed to enhance the medical student's learning by teaching a rational approach to symptoms and concerns involving the breast, and the implementation of oncologic and surgical care after biopsy proven pathology is identified. The student will be exposed to full field digital mammography, breast ultrasound, breast MRI, and image guided interventional procedures such as needle localization prior to surgical biopsy, and stereotactic, ultrasound, and MRI-guided core biopsies. Students will also observe and have opportunity to practice skills at providing compassionate patient care through patient interactions to promote breast health, during tense encounters such as breast biopsy, and potentially high-anxiety situations such as discussing potentially abnormal mammographic results. The elective can be customized based on the student's interests and plans for residency. This course would be beneficial to students interested in Radiology, Family Medicine, or Obstetrics & Gynecology. For questions please contact Dr. Johnson via email at karen.johnson2@dm.duke.edu or Beverly Harris (beverly.harris@dm.duke.edu), 919-684-7645. Credits: 2 Enrollment Max: 2 (1 student per two week period). *Karen S. Johnson, MD; Jay A. Baker, MD; Sora Yoon, MD; Connie Kim, MD; Sujata Ghate, MD; Mary Scott Soo, MD; Ruth Walsh, MD.*

RADIOL-403C. GENITOURINARY IMAGING. The 4th year elective in Genitourinary Imaging (GUI) is designed to educate medical students about the most common procedures within the field of GUI. The students will be involved in: (1) education about the diverse imaging modalities used in GUI; (2) imaging indications and

techniques unique to GUI; and (3) review and interpretation of various studies. Documentation skills will be taught. By the end of the rotation, the student should be capable of preliminary interpretation of GU imaging studies. Credit: 4. Enrollment Max: 1. For questions about the course please contact Dr. Leder at richard.leder@dm.duke.edu. *Richard Leder, MD; Other Abdominal Imaging Faculty*

RADIOL-404C. VASCULAR AND INTERVENTIONAL RADIOLOGY. All physicians will encounter patients who will undergo interventional procedures. The 4th year elective in Vascular and Interventional Radiology (VIR) is designed to educate medical students about the most common procedures performed by VIR. The students will be involved in: (1) pre-procedural patient care: focused patient assessment (in a clinic setting, as well as in the inpatient consult setting), review of imaging, and informed consent process; (2) intra-procedural care: devices, terminology, and technique; and (3) post-procedural patient care: focused patient assessment (in the radiology recovery room, as well as in the patient setting), procedural documentation/reporting, and patient follow-up plan. Documentation skills will be taught. By the end of the rotation, the student should be capable of determining whether a procedure is needed routinely, urgently, or emergently; will be able to select the most indicated procedure based on patient presentation (develop a management plan); and will be knowledgeable about pre- and post-procedure patient care. Credits: 2. Enrollment Max: 2. *Waleska Pabon-Ramos, MD, MPH; Charles Kim, MD; David Sopko, MD; Michael Miller, MD; Paul Subock, MD; Tony Smith, MD*

RADIOL-420C. PEDIATRIC RADIOLOGY. Pediatric radiology is unique from other radiology subspecialties in that almost all imaging modalities (plain film, ultrasound, fluoroscopy, CT, MR examinations) and organ systems (e.g. brain and spine, chest, gastrointestinal tract, musculoskeletal system) are evaluated on a daily basis. Moreover, there are many disease processes and presentations that are unique to children. The importance of understanding normal vs abnormal development is also unique to pediatric imaging. Students can learn by observing patients, nurses, technologists and radiologists during image acquisition in pediatric fluoroscopy, ultrasound, CT and MRI as well as in the reading room observing and helping the radiology residents, fellows and attendings protocol, interpret, and discuss pediatric imaging cases. The imaging modalities used to evaluate a child's injury or illness are openly discussed, during film interpretation. Each history is reviewed, clinical question addressed, and the exams are formulated to optimize obtainable information while minimizing patient risks (e.g. radiation exposure or need for sedation). Other learning tools include computer access to teaching file cases, online teaching files, daily case conferences and subspecialty case conferences. Medical students are encouraged to ask questions and participate in preliminary film interpretation. For each 2 weeks on service, one case is to be selected and briefly presented at an interesting case conference. This case will be added to the division's electronic teaching file. There is an extensive "to do" list to guide study and encourage physician and patient interaction. There is a pretest and post-test to assess learning after reading some selected articles from the pediatric radiology literature. An introductory text is available on loan from the pediatric radiology division. There is also a graded final examination. For more information please contact Dr. Caroline Carrico at 919-684-7514 or carri026@mc.duke.edu or her assistant Thressa Thomas at 919-684-7442. Credit: 4. (Course begins promptly at 8:30 a.m. in Pediatric Radiology Division, 1st Floor Children's Health Center - 1905A). Enrollment: max 1. Course director: *Caroline Carrico, M.D. Other Faculty, Drs. Donald Frush, Ana Gaca, Charles Maxfield and Gary Schooler*

RADIOL-421C. CLERKSHIP IN NEURORADIOLOGY. A specialized program of detailed instruction in neuro-radiology. The program includes participation in many interdepartmental conferences and the performance and interpretation of a variety of examinations including cerebral angiography, computerized axial tomography, magnetic resonance images, and myelography. For more information please contact Dr. James Eastwood at (919)684-7466 or via email at eastw004@mc.duke.edu. Staff Assistant contact: Babbie Williams, (919) 684-7406. Students should meet on the first day of class at the Neuroradiology CT reading room, DMP 1W98. Orientation to the class follows. Please report promptly at 8:30 a.m. Credit: 4. Enrollment: max 2. *James Eastwood, MD and staff*

RADIOL-429C. BASIC RADIOLOGY CLERKSHIP. This course is designed to provide an overview of the various imaging modalities of diagnostic and interventional radiology and their clinical utility. The elective consists of: (a) a high quality lecture series (b) hands on time on the PACS workstations, reviewing preselected teaching cases, (c) participation in multispecialty conferences and grand rounds, and (d) rotation time on all 9 subspecialty areas in diagnostic and interventional radiology (Cardiothoracic, Neuroradiology, Musculoskeletal, Pediatric, Nuclear Medicine, Breast imaging, Body Imaging (CT/MRI/US), Gastrointestinal fluoroscopy, Vascular and Interventional Radiology). On these 9 sub-rotations, students are allowed an opportunity to participate in imaging examination acquisition and interpretation. Though this they can gain empathy for patients undergoing imaging procedures, and

can learn the indications/contraindications and utility of a large variety of diagnostic and therapeutic imaging procedures. There is extensive required reading, materials are provided by the department. Students will be assessed in large part on their clinical performance, case presentations, a midterm and two (local and national) final examinations. For more information please contact Dr. Caroline Carrico at 684-7514 or via email at caroline.carrico@duke.edu. Or you can contact the course coordinator, Ms. Thressa Thomas at 684-7442. The course director and or her assistant will send enrolled students an email regarding the orientation, time and meeting location. The orientation and lecture room is the generally same for each rotation (room 1512B2, inside the Musculoskeletal Radiology reading room) but the time varies. NOTE: Students that have taken Radiology 205C are not eligible to enroll in Radiol 429C. Credit: 4. Enrollment: min 4, max 9. *Caroline Carrico, MD and staff*

RADIOL-437C. MUSCULOSKELETAL IMAGING. During this four week elective, the student will be exposed to conventional x-rays in bone radiology, emergency room bone films, bone tumor films and musculoskeletal MRI. At the conclusion, the student will be able to identify fractures and have a working knowledge of musculoskeletal radiology. A case presentation will be required. For more information please contact Dr. Caroline Carrico at 684-7469 or via email at caroline.carrico@duke.edu. Credit 4. Enrollment: max. 2. *Charles Spritzer, MD; Caroline Carrico, MD; Drs. R. Lee Cotbran, Jr., MD; Clyde Helms, MD; and Emily Vinson, MD*

Study Away

Clinical Science Electives

STDYAWAY-410C. EXTRA-MURAL CLINICAL. Approved fourth year experience at another location.

STDYAWAY-411C. STUDY AWAY AT UNC. Fourth year clinical elective at UNC. Upon receipt of the acceptance letter from UNC, the Registrar's Office at Duke University School of Medicine will process the enrollment for study away at UNC.

STDYAWAY-421C. STUDY AWAY AT WAKE FOREST UNIVERSITY SCHOOL OF MEDICINE. Fourth year clinical elective at WFU. Upon receipt of the acceptance letter from WFU, the Registrar's Office at Duke University School of Medicine will process the enrollment for study away at WFU.

STDYAWAY-431C. STUDY AWAY AT EAST CAROLINA UNIVERSITY SCHOOL OF MEDICINE. Fourth year clinical elective at ECU. Upon receipt of the acceptance letter from ECU, the Registrar's Office at Duke University School of Medicine will process the enrollment for study away at ECU.

STDYAWAY-440C. EXTERNSHIP IN INPATIENT CARE AT TEACHING HOSPITAL KARAPITIYA & MAHAMODARA GALLE IN SRI LANKA. Management of patients admitted to the Medicine/Surgical wards at Teaching Hospital Karapitiya and Teaching Hospital Mahamodara Galle in Sri Lanka. The student will function under the guidance of Professor P.L. Ariyananda. The extern would assist with admissions, and day to day care of patients. Outpatient care will also be important. Independence and innovation by the student will be particularly important. Credit: 8 Max: 2

Surgery

Chair: Allan Kirk, MD, PhD, FACS

Campus Box 3704

Phone: (919) 681-3445; Fax: (919) 681-2779

Assistant: Kim Toole

Executive Director: Katherine Stanley

Department/Faculty Information: <http://surgery.duke.edu/>

Second Year, Two-Week Clinical Selectives

SURGERY-205C. SURGERY. The required course in surgery is given in the second year and consists of an eight week clinical clerkship. The primary goal is to provide a rich experience in the discipline of surgery while introducing students to the practice and principles of surgery. The objectives of this course are satisfied in a variety of ways. Students are actively incorporated into the surgical services. Students are divided into two groups, one at Duke University and the other at the Veterans Administration Medical Center, and each works with Duke Surgical residents and members of the surgical faculty in the traditional surgical disciplines and surgical specialties. Students are assigned patients on the surgical wards where they serve a crucial role in the care, diagnosis, management, and

follow-up of their patients. Clinical rounds are made daily and provide real-time patient care experience and instruction. The fundamental topics which form the foundation of surgical practice are presented at bi-weekly seminars with presentations by senior staff of the Duke University Department of Surgery. The subjects discussed include a broad range of topics in general, thoracic, transplant and vascular surgery in addition to the surgical specialties encompassing neurosurgery, orthopaedics, otolaryngology, plastic surgery, and urology/ Students are also given an opportunity to re-inforce their knowledge of anatomy and physiology. These fundamental principles are discussed during dissections of fresh tissue performed in the Duke University of Surgery Fresh Tissue Laboratory. Students are also given an opportunity to test their hand eye coordination in the Surgical Education and Activities Lab. The entire experience is consolidated during various sessions in experimental surgery, during which each student serves as the anesthesiologist, first assistant, and operating surgeon in performance of surgical procedures on experimental animals. Credit: 8. *John Haney, MD*

SURGERY-206C. PRIMARY CARE LEADERSHIP TRACK (PCLT) - SURGERY. The required course in surgery is given in the second year and consists of an eight week clinical clerkship. The primary goal is to provide a rich experience in the discipline of surgery while introducing students to the practice and principles of surgery. The objectives of this course are satisfied in a variety of ways. Students are actively incorporated into the surgical services. Students are divided into two groups, one at Duke University and the other at the Veterans Administration Medical Center, and each works with Duke Surgical residents and members of the surgical faculty in the traditional surgical disciplines and surgical specialties. Students are assigned patients on the surgical wards where they serve a crucial role in the care, diagnosis, management, and follow-up of their patients. Clinical rounds are made daily and provide realtime patient care experience and instruction. The fundamental topics which form the foundation of surgical practice are presented at bi-weekly seminars with presentations by senior staff of the Duke University Department of Surgery. The subjects discussed include a broad range of topics in general, thoracic, transplant and vascular surgery in addition to the surgical specialties encompassing neurosurgery, orthopaedics, otolaryngology, plastic surgery, and urology/ Students are also given an opportunity to re-inforce their knowledge of anatomy and physiology. These fundamental principles are discussed during dissections of fresh tissue performed in the Duke University of Surgery Fresh Tissue Laboratory. Students are also given an opportunity to test their hand eye coordination in the Surgical Education and Activities Lab. The entire experience is consolidated during various sessions in experimental surgery, during which each student serves as the anesthesiologist, first assistant, and operating surgeon in performance of surgical procedures on experimental animals. Credit: 8. *Alexander Perez, MD*

SURGERY-220C. NEUROSURGICAL INTERVENTION IN THE MODERN ERA. This neurosurgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive neurosurgery, including the subspecialties (Neuro-oncology, Vascular, Functional, Spine, and Pediatrics). There will be didactic instruction with patient care exposure in the clinic setting, the Emergency Department, on the neurosurgical wards and in the operating room. Credit: 2. Enrollment Max. 4. Location: Duke North Ward 4200, 5:45 a.m. Contact: For questions and to confirm meeting time and location, please contact Dr. Haglund by pager at 970-2106 or via email at haglu001@mc.duke.edu. The standard meeting location is Monday at 5:45 am in the Neurosurgery ICU on 4200, you can also call 919-684-8111 and ask for the Neurosurgery Resident on call covering the ER to get the exact time rounds start the night before your rotation starts. *Michael Haglund, MD/PhD*

SURGERY-221C. SURGICAL TREATMENT OF DISEASES OF THE HEAD AND NECK, EARS, NOSE AND THROAT. This otolaryngology, head and neck surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive head and neck surgery, including: pediatrics, otology, laryngology, rhinology, benign and malignant disease of the neck (including thyroid), benign and malignant disease of the upper aerodigestive tract, microvascular reconstruction, and craniomaxillofacial trauma. There will be didactic instruction with patient care exposure in the clinic, emergency department and operating room settings. Credit: 2. Enrollment Max: 3. Location: Duke North Ward 6300 - 6:30 a.m. Contact: Please contact the OHNS resident on call at 970-1320 the night before the rotation starts to confirm the exact time and place to meet. *Rose Eapen, MD*

SURGERY-223C. FROM COSMESIS TO RECONSTRUCTION, FROM INFANTS TO THE ELDERLY. This plastic surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive plastic surgery, including the subspecialties (hand, aesthetics, extremity salvage, soft tissue coverage, craniomaxillofacial, reconstructive microsurgery). There will be didactic instruction with patient care

exposure in the clinic setting, outpatient surgery center and the operating room. Credit: 2. Enrollment Max. 2. Location and time: Duke North 6300 ward at 6:00am. *Michael Zenn, MD*

SURGERY-224C. SURGICAL CRITICAL CARE IN THE MODERN ERA. The Surgical Critical Care Selective introduces the second year medical student to the comprehensive care of the critically ill surgical patient. Students participate in the care of: the postoperative patient, the septic patient, the patient after multiple trauma, the patient suffering from multi-system organ failure, and the patient with acute lung injury/acute respiratory distress syndrome. Students are part of the Surgical Critical Care team. Students present on rounds, participate in didactic sessions, and experience direct patient care exposure in the Surgical Intensive Care Unit (SICU) setting. Credit: 2. Enrollment Max. 2. Location: Duke N. SICU, Unit 2200 - 6:20 a.m. For more information and to confirm meeting location and time, please contact: Dr. Mark Shapiro at ml.shapiro@duke.edu. Students may also email Daniel Kearney at daniel.kearney@duke.edu. *Mark Shapiro, MD and Steven Vaslef, MD/PhD*

SURGERY-225C. MODERN GENERAL THORACIC SURGERY: MULTIDISCIPLINARY APPROACH TO COMPLEX THORACIC DISORDERS. This thoracic surgery selective is designed to introduce the second year medical student to the multidisciplinary approaches to thoracic surgery, with a focus on minimally invasive surgery, thoracic surgical oncology, and robotics. Students will be involved in the evidence-based evaluation and management of lung cancer, esophageal cancer, mediastinal tumors, and other malignant as well as benign thoracic disorders. There will be extensive exposure to patient care in the operating room, the hospital and the clinic, in addition to didactic instruction. Credit: 2. Enrollment Max.4. Location: Duke North, Ward 3100: 6:00 a.m. Contact: Students should contact Dr. D'Amico at Phone (919) 684-4891, (919) 681-0491 or via email at damic001@mc.duke.edu. *Thomas A. D'Amico, MD*

SURGERY-226C. MODERN CARDIAC SURGERY: FROM CABG TO GENE THERAPY. This cardiothoracic surgery selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive cardiac and thoracic surgery, including the subspecialties (adult ischemic Coronary Artery Bypass Grafting (CABG), adult valvular surgery, heart and lung transplantation, minimally invasive cardiothoracic surgery, congenital cardiac repair, redo cardiothoracic surgery, robotic cardiac surgery). There will be didactic instruction with patient care exposure in the clinic setting, outpatient surgery center and the operating room. Credit: 2. Enrollment Max. 4. Contact: Please email Dr. Lin at lin00003@mc.duke.edu for more information and to find out the time and location for the first day of classes. Location: Duke North, Ward 3200. *Shu Lin, MD*

SURGERY-227C. UROLOGY: SURGICAL TRTMENT OF BENIGN UROGENITAL PROBS & MALIGNANT DISEASES IN UROGENITAL TRACT. This urology selective is designed to introduce the second year medical student to the medical and surgical aspects of comprehensive urologic surgery, including the kidneys, ureters, bladder and male reproductive system and its subspecialties (pediatric, incontinence in the male and the female, sexual dysfunction, benign disease of the urogenital tract, malignant disease of the urogenital tract, reconstruction after tumor surgery, trauma). There will be didactic instruction with patient care exposure in the clinic setting, emergency department, outpatient surgery center and the operating room. Please contact Dr. Edward Rampersaud at edward.rampersaud@duke.edu one week prior to starting the rotation. Credit: 2. Enrollment Max. 2. *Edward Rampersaud, MD*

SURGERY-229C. EARLY EXPERIENCES IN EMERGENCY MEDICINE. The American College of Emergency Physicians defines emergency medicine as "the medical specialty with the principal mission of evaluating, managing, treating and preventing unexpected illness and injury." In this selective, students will gain firsthand exposure to the approach to the undifferentiated emergency medical patient, including essential diagnostic and therapeutic measures. Students will be paired with emergency medicine attending physicians or senior emergency medicine residents to gain exposure to the principles of emergency diagnosis, treatment, and disposition. Students will work 7 shifts in the emergency department which will be a variety of morning, afternoon, and overnight time slots. Didactic lectures occur on Monday and Thursday mornings. Credit: 2. Enrollment max. 2 (but may vary in different sections). Location: Will be provided in an introductory email but typically 9am or 1pm in conference room 2619 in the 2nd floor administrative suite above the ED. Contact: Students should contact Dr. Gordon should they have any questions at 684-5537 or via email davidc.gordon@duke.edu. An alternative contact is Dr. Gordon's assistant David Massung at 681-4458 or david.massung@duke.edu. *David Gordon, MD*

SURGERY-230C. TRAUMA & ACUTE CARE SURGERY. This course is designed to provide students interested in trauma and acute care surgery with further experience in the emergency department and the operating room. The

course emphasizes the triage and resuscitation of leveled trauma patients in the emergency department, as well as the operative care of patients with multi-system trauma injuries or other acute surgical problems. The students will work 12-13 hour night shifts to allow for optimal exposure to traumas and other surgical emergencies, as well as to increase one-on-one supervision and teaching. The student will be partnered with the night trauma chief resident and will work closely with the attending staff on the trauma service. Credit: 2. Enrollment: max 2. *Mark Shapiro, MD; Steven Vaslef, MD; Gregory Georgiade, MD; John Scarborough, MD; and Kelli Brooks, MD*

SURGERY-231C. ESSENTIALS OF PEDIATRIC SURGERY. The objective of this course is to present the student to a wide array of pediatric surgical conditions. The student will be introduced to various congenital anomalies and pediatric surgical pathophysiology. Curriculum consists of exposure to inpatient (operating room, wards, intensive care units), emergency room, and outpatient care. The student is expected to attend all conferences, lectures, and become an integral part of the surgical team. Credit: 2. Enrollment Max: 2. Location: Pediatric Surgery Office (HAFS 6680), 6:00am. Course contact: Dr. Obinna Adibe via e-mail obinna.adibe@dm.duke.edu. *Obinna Adibe, MD; Henry Rice, MD; and Elisabeth Tracy, MD*

Clinical Science Electives

SURGERY-252C. EMERGENCY MEDICINE – (PCLT students only). The American College of Emergency Physicians defines emergency medicine as “the medical specialty with the principal mission of evaluating, managing, treating and preventing unexpected illness and injury.” Course Goals: 1) Students will see patients with the full range of chief complaints that present to the Duke University Emergency Department. 2) Students will gain experience in making initial evaluations as well as diagnostic and treatment plans with an emphasis on detecting and treating immediate life threatening conditions. 3) Students' ability to rapidly obtain critical facets of a history and physical examination will improve. 4) Students will mature as clinical problem-solvers by seeing several patients per day with undifferentiated chief complaints. How Goals Are Achieved: 1) Students will work with attendings and residents during approximately 13 eight-hour shifts per month. A mixture of day, evening, and overnight shifts will be assigned. 2) Medical student lectures will be held every Monday morning. 3) Students will attend resident conferences on Wednesday mornings. 4) Students will shadow a Durham EMS paramedic team for one day. Methods of Evaluation: Attendings and senior residents will give feedback to students. For more information please contact Dr. David Gordon at 919-684-5537 or by email, davidc.gordon@duke.edu. Prerequisites: none. First day meeting: 9:00 a.m. in the conference room located in the emergency services administrative suite above the emergency department. Administrative contact: David Massung, email at david.massung@duke.edu or phone at 681-4458. Credit: 4. Enrollment: max 10. *David Gordon, MD*

Fourth Year Clinical Electives

SURGERY-401C. ADVANCED SURGICAL CLERKSHIP. The course aims to provide an intense educational experience with graded responsibility of surgical care. The student selects a specific surgeon mentor and is expected to attend multidisciplinary conferences, e.g. gastrointestinal, vascular, transplant, endocrine, oncology, etc. The student is expected to evaluate surgical patients in an outpatient setting as well as participating in inpatient and operative patient care. Attendance at clinical research conferences, case conferences, grand rounds, and subspecialty conferences is required. Graded patient care responsibility under supervision is encouraged to prepare the student for future assumption of duties as a house officer able to diagnose and treat surgical diseases. Students must verify with the specific attending that he/she is available during the time the student wishes to enroll in Surgery 401C. Only one student can work with a specific attending during any one time period. Permission of instructor is required. For information about the course, please contact Dr. Trey Blazer at trey.blazer@duke.edu or by phone at 684-6553. To obtain permission (and permission numbers) to enroll in the course, students should contact Honor Sanderford. She can be reached via email at honor.sanderford@duke.edu or by phone at 919-613-5069. Credit: 5. Enrollment: min. 1, max 27. *Trey Blazer, MD. Available mentors: Mitchell Cox, MD; Thomas D'Amico, MD; Robert Davis, MD; Jeffrey Gaca, MD; Donald Glower, MD; David Harpole, Jr., MD; Sandhya Lagoo, MD/PhD; Shelly Hwang, MD/MPH; Jeffrey Lawson, MD/PhD; Shu Lin, MD/PhD; Andrew Lodge, MD; Christopher Mantyh, MD; Richard McCann, MD; Theodore Pappas, MD; Alexander Perez, MD; Sanziana Roman, MD; Randall Scheri, MD; Cynthia Shortell, MD; Julie Sosa, MD/MA; and Steven Vaslef, MD/PhD*

SURGERY-402C. EMERGENCY MEDICINE SUBINTERNSHIP. This sub-internship is designed for students with a career interest in emergency medicine. Students will hone their approach to the emergency medical patient, including essential diagnostic and therapeutic measures. The experience will encourage the development of skills important to the practice of emergency medicine including managing multiple patients, communicating with

consultants, and making appropriate dispositions. Efforts are made to coordinate the majority of a student's shifts with a core group of faculty to provide mentorship. Students will attend Monday morning medical student lectures, Wednesday morning resident conferences, shadow a Durham EMS paramedic team for one day, and deliver a final case presentation. For more information please contact Dr. David Gordon at 684-5537 or via email, davidc.gordon@duke.edu. Prerequisites: Students must have already completed a prior emergency medicine rotation and permission of the instructor is required. Please try to contact the course director at least several weeks in advance of enrollment to help guarantee availability. First day meeting: 9:00 a.m. in the conference room located in the emergency services administrative suite above the emergency department. Administrative contact, David Massung, email david.massung@duke.edu or phone at 681-4458. Credit: 5. max: variable. Only offered in summer 43, summer 44 and fall sections. *David Gordon, MD*

SURGERY-403C. SUB-INTERNSHIP PLASTIC SURGERY INTEGRATED PROGRAM. This course is designed for students who have an interest in plastic surgery as a career. Duties are similar to a first year resident. This course provides the student with an in-depth overview of clinical activities, emergency room call, inpatient care and assisting in the operating room, ward rounds and conference participation. This course will also provide primary responsibility for patient care similar to an internship in a supervised fashion. This rotation will involve more time commitment than our regular rotation with additional call and work responsibilities of up to 80 hours a week. For questions, please contact students should contact Lori Allsbrook via e-mail at lori.allsbrook@duke.edu or 919-681-4771. Enrollment Max: 3. Credits: 5. *Michael Zenn, MD*

SURGERY-412C. EMERGENCY MEDICINE. The American College of Emergency Physicians defines emergency medicine as "the medical specialty with the principal mission of evaluating, managing, treating and preventing unexpected illness and injury." Course Goals: 1) Students will see patients with the full range of chief complaints that present to the Duke Hospital Emergency Department. 2) Students will gain experience in making initial evaluations as well as diagnostic and treatment plans with an emphasis on detecting and treating immediate life threatening conditions. 3) Students' ability to rapidly obtain critical facets of a history and physical examination will improve. 4) Students will mature as clinical problem-solvers by seeing several patients per day with undifferentiated chief complaints. How Goals Are Achieved: 1) Students will work with attendings and residents during approximately 13 eight-hour shifts per month. A mixture of day, evening, and overnight shifts will be assigned. 2) Medical student lectures will be held every Monday morning. 3) Students will attend resident conferences on Wednesday mornings. 4) Students will shadow a Durham EMS paramedic team for one day. Methods of Evaluation: Attendings and senior residents will give feedback to students. For more information please contact Dr. David Gordon at 919-684-5537 or by email, davidc.gordon@duke.edu. Prerequisites: none. First day meeting: 9:00 a.m. in the conference room located in the emergency services administrative suite above the emergency department. Administrative contact: David Massung, email at david.massung@duke.edu or phone at 681-4458. Credit: 4. Enrollment: max varies by term. *David Gordon, MD*

SURGERY-420C. GENERAL SURGICAL ONCOLOGY. The course is designed for the student interested in surgical oncology. The students are involved in patient care with a specific surgeon but, in addition, are expected to attend multidisciplinary conferences related to gastrointestinal and breast carcinoma. These multidisciplinary conferences involve medical and radiation oncology as well as surgical oncology. The student is also expected to evaluate surgical patients in an outpatient setting as well as participating in inpatient and operative patient care. This course is designed for students who have an interest in the basic sciences in relation to surgical oncology. Attendance at research conferences involved in the molecular and cellular biology of human cancers is also expected. For more information please contact Dr. Trey Blazer via email, trey.blazer@duke.edu or by phone at 684-6553. Permission of instructor is required. Credit: 4. Enrollment: min 1, max 2. *Trey Blazer, MD; Bryan Clary, MD; Thomas D'Amico, MD; and David Harpole Jr, MD; H. and Douglas Tyler, MD*

SURGERY-423C. ADVANCED SURGERY-EMPHASIS CARDIOVASCULAR/THORACIC. Advanced concepts in surgery are presented in seminars and in ward, clinic, and operating room experiences. Fifty to 75 percent of the time is devoted to cardiovascular/thoracic surgery and related basic topics and the remainder to surgery generally. For more information please contact Dr. D'Amico at 668-0561. Credit: 4. Enrollment: min 1, max 5. *Thomas D'Amico, MD; Robert Davis, MD; Jeffrey G. Gaca, MD; Donald Glower, MD; John C. Haney MD, David Harpole, MD; Chad Hughes, MD; Robert Jaquiss, MD; Shu Lin, MD; Andrew Lodge, MD; Carmelo Milano, MD; Mark W. Onaitis, MD; Jacob Schroder, MD; Peter K. Smith, MD; and Betty C. Tong, MD*

SURGERY-426C. ADVANCED CLERKSHIP IN PEDIATRIC SURGERY. This course is designed to familiarize the student with the whole range of surgical problems in children, but with emphasis on the pathophysiology of surgical and related problems in the newborn infant and the total care of the child with a malignancy. The student is encouraged to participate fully in the patient care aspects of the service and is considered an integral part of the patient care team. This is a four week experience is probably optimal for most students. It may be combined with other advanced surgical clerkships such as SURGERY-401c or with four weeks of neonatology (PEDS-426C) or other courses depending on the interests of the student. For more information please contact Maria Fryar at 681-5077 or via email at maria.fryar@duke.edu. Prerequisite: Permission of instructor and brief pre-enrollment interview with Dr. Henry Rice. Credit: 4. Enrollment: max 1. *Henry Rice, MD*

SURGERY-427C. ADVANCED UROLOGIC CLERKSHIP. Students are exposed to the complete realm of urology including diagnosis, non-operative management, surgical treatment, and post-operative care of adult and pediatric patients. The course includes personal interaction with the entire faculty in clinics, operating rooms, rounds, and teaching conferences. Students will be exposed to endoscopic, laparoscopic, oncologic, and reconstructive adult and pediatric surgery. Students are involved in direct patient care with the house staff while following patients during their pre-, intra-, and post-operative course. For students interested in a specific area of urology, focused exposure to a single discipline is welcomed but dependent upon faculty approval. In addition to participation in conferences, students are expected to give a brief case presentation at Grand Rounds. For more information students should contact Dr. Edward Rampersaud via email at edward.rampersaud@duke.edu. Duke students report to rounds on 6300 at 6:30 a.m. Credit: 4. Enrollment: max 3. *Edward Rampersaud, MD; Sherry Ross, MD; David Albala, MD; Craig Donatucci, MD; Stephen Freedland, MD; Brant Inman, MD; Kelly Maloney, MD; Judd Moul, MD; Glenn Preminger, MD; Cary Robertson, MD; Philip Waltber, MD/PhD; and George Webster, MD*

SURGERY-431C. CLINICAL NEUROSCIENCE IN VETERANS. Studying the healthcare of veterans provides a unique perspective for students interested in serving disadvantaged populations. This course will allow students to obtain a broad overview of the common clinical neuroscience disorders in veterans. Specific objectives will be pursued in four major clinical areas including 1) neurosurgery (cranial, spinal, and peripheral nerve conditions treated surgically), 2) neurology (e.g. stroke, dementias, movement disorders, ALS), 3) traumatic brain injury, and 4) psychiatry (PDS substance abuse, chronic pain). Permission of course director is required. For more information and permission numbers, please contact Karen Koenig at 919-684-3271 or via e-mail at koeni002@mc.duke.edu. First day of classes: student are to meet promptly at 7:00 a.m., 5th floor (Neurosurgery office) at Durham VAMC. Credit: 2. Enrollment Max: 1. *Cory Adamson, MD, PhD (course director); Bruce Capehart, MD (TBI and psychiatry); Richard Bedlack, MD, PhD (neurology); Warren Strittmatter, MD (TBI and neurology); Scott Strine, DO (neurology).* COURSE NO LONGER AVAILABLE, EFFECTIVE 2014-2015.

SURGERY-439C. CLINICAL OTOLARYNGOLOGY. This 4-week course provides the senior student with a comprehensive survey of clinical otolaryngology, from oncology to pediatrics to otology to laryngology. Duties include intern-level participation in both outpatient clinic activities and inpatient care, including assisting in the operating room. The student participates in daily ward rounds and in weekly conferences held by the division. Students are expected to schedule call each week and give a 15-20 minute grand rounds style presentation on their selected OHNS topic at the end of the rotation. Students should report at 6:30 a.m. on 6300 for the first day of classes. For more information on where to report or basic questions, please refer to the OHN consult pager, 970-1320 or contact Susan Marabella (susan.marabella@duke.edu) or 919-681-6048. Credit: 4. Enrollment: max: 2. *Rose Eapen MD, MHS; Seth Cohen, MD, MPH; Ramon Esclamado, MD, MS; Samuel Fisher, MD; David Jang, MD; David Kaylie, MD; Richard Scher, MD; Debara Tucci, MD; David Becker, MD, Walter Lee, MD, Eileen Raynor, MD, Charles Woodard, MD; and David Witsell, MD/MHS*

SURGERY-441C. SUBINTERNSHIP IN SURGICAL INTENSIVE CARE. This course is designed to broaden the student's knowledge and experience in dealing with critically ill patients. Under supervision, students function as sub-interns in the Surgical Intensive Care Unit (SICU). Students are assigned their own patients and actively participate in daily rounds as part of the SICU team. There are on-line didactic lectures which are expected to be completed during the month on core aspects of critical care, as well as weekly Critical Care Grand Rounds or Multi-disciplinary Conference. Students take call one night in four and work on a one-on-one basis with SICU house staff in the supervised management of critically ill patients. Four weeks are spent in the SICU at Duke University Medical Center (trauma, vascular surgery, liver-kidney-pancreas transplantation, general surgery, surgical subspecialties). There is emphasis on teaching of procedures and techniques necessary for the management of all critically ill patients

including hemodynamic assessment and monitoring, cardiovascular resuscitation and use of vasoactive drugs, ventilator management including ARDS, prevention and management of nosocomial infections, and nutritional support. Students are formally evaluated by the SICU house staff and the attending physician. For more information please contact Dr. Steven Vaslef at 684-3636 or via email, vasle001@mc.duke.edu. The schedule is available in the SICU or by calling the SICU at 681-2241 to find out who is rounding that week. Rounds begin at 6:30 a.m. in the SICU. C-L: ANESTH-441C. Credit: 5. Enrollment: max 2. *Steven Vaslef, MD/PhD; Mark Shapiro, MD; and staff*

SURGERY-443C. TRAUMA SERVICE. This course is designed to provide students interested in trauma care with further experience both in the Emergency Department and on the Inpatient Trauma Service. The course emphasizes both triage and resuscitation for major and minor emergency problems in the Emergency Department and also pre- and postoperative care on the Inpatient Trauma Service. The student has a full-time experience by assuming duties and responsibilities similar to a sub-intern. Emphasis is placed on developing skills in the care of patients with multi-system injuries in the Emergency Department, Inpatient Service, and Operating Room. Students work in conjunction with the attending staff and the residents on the Trauma Service. For more information please contact Dr. Steven Vaslef at 684-3636 or via email at vasle001@mc.duke.edu. Students should meet in the SICU at 6:30 a.m. on the first day of the rotation. Credit: 4. Enrollment: max 2. *Steven Vaslef, MD/PhD*

SURGERY-444C. INTRODUCTION TO PLASTIC, RECONSTRUCTIVE AND MAXILLOFACIAL SURGERY. This course is designed for students who may have a future interest in plastic surgery. Duties include the preoperative evaluation of patients, assisting in the operating room, making daily ward rounds, and participation in conferences. For more information, please contact Lori Allsbrook via email lori.allsbrook@duke.edu. Credit: 4. Enrollment: max 2. *Michael Zenn, MD*

SURGERY-448C. SUBINTERNSHIP IN OTOLARYNGOLOGY HEAD AND NECK SURGERY. This course is a full educational experience in OHNS with duties and responsibilities similar to a first year resident. This course provides the student with a comprehensive survey of clinical activities, inpatient care, assisting in the operating room and emergency room call. The student participates in ward rounds and in various conferences held by the division. At the end of the subinternship, the student will present at Grand Rounds Conference a 20-30 minute presentation on the topic of his/her choice (usually based on a patient the student has taken care of during the subinternship). For more information on where to report or basic questions, please refer to the OHN consult pager, 970-1320. Students may also contact Susan Marabella (susan.marabella@duke.edu) or 919-681-6048. Credits: 5. Enrollment max: 2. *Rose Eapen, MD; David Becker, MD; Seth Cohen, MD/MPH; Ramon Esclamado, MD/MS; Samuel Fisher, MD; David Jang, MD; David Kaylie, MD; Walter Lee, MD; Eileen Raynor, MD; Richard Scher, MD; Debara Tucci, MD; David Witsell, MD/MHS; and Charles Woodard, MD*

SURGERY-451C. SUBINTERNSHIP IN UROLOGIC SURGERY. Students will participate in the diagnosis, management, and surgical treatment of patients with urologic disorders. Sub-internship students will take on intern-level responsibilities, including daily management of inpatients, clinic responsibilities, participation in surgery, and overnight call. Prerequisite: Permission of the instructor is required. Please contact Dr. Rampersaud at edward.rampersaud@duke.edu for more information and to obtain your permission number. Credit: 5. Enrollment max: 3 *Edward Rampersaud, MD; Sherry Ross, MD and staff*

Basic Science Departments

Biochemistry

Richard Brennan, PhD
Office: 255B Nanaline H. Duke
Campus Box: DUMC 3711
Phone: (919) 684-6466; Fax: (919) 684-8885
Assistant: JoAnn Kempel
Business Manager: Esther Self
<http://www.biochem.duke.edu/>

Biostatistics and Bioinformatics

Elizabeth DeLong, PhD
Office: 11072 Hock Plaza, Suite 1102

Campus Box: DUMC 3711
Phone: (919) 668-8828; Fax: (919) 668-7061
Assistant: Debbie Medlin
Business Manager: Dawn Hails
<http://www.biostat.duke.edu/>

Cell Biology

Brigid Hogan, PhD
Office: 255B Nanaline H. Duke
Campus Box: DUMC 3711
Phone: (919) 684-8085; Fax: (919) 684-8592
Assistant: Jacquelyn Soderling
Business Manager: Mollie Sykes
<http://www.cellbio.duke.edu/>

Immunology

Michael S. Krangel, PhD
Office: 318 Jones Building
Campus Box: DUMC 3010
Phone: (919) 684-3578; Fax: (919) 684-8982
Assistant: Jennifer Goins
Business Manager: Todd Leovic
immunology.mc.duke.edu/

Molecular Genetics & Microbiology

Joseph Heitman, MD, PhD
Office: 322 CARL Building
Campus Box: DUMC 3546
Phone: (919) 684-2814; Fax: (919) 684-2824
Assistant: Melissa Palmer
Business Manager: Susan Wiley
<http://www.mgm.duke.edu/>

Neurobiology

Stephen G. Lisberger, PhD
Office: 101 Bryan Research Building
Campus Box: DUMC 3209
Phone: (919) 684-0320; Fax: (919) 684-4431
Assistant: Irene Lofstrom
Business Manager: Ann Keefe
<http://www.neuro.duke.edu/>

Pharmacology and Cancer Biology

Donald P. McDonnell, PhD
Office: C238A LSRC
Campus Box: DUMC 3813
Phone: (919) 684-6035; Fax: (919) 681-7139
Assistant: Trena Martelon
Business Manager: Lloyd Hardison
pharmacology.mc.duke.edu/

Thesis

Basic Science Electives

THESIS-301B. THESIS. Graduation from Duke School of Medicine (or continuation with fourth year rotations after completion of third year research) requires completion of an acceptable thesis describing quantitative research. The thesis is in the form of a scientific manuscript of approximately 3,000 to 6,000 words (15-25 double-spaced pages). Length does not include figure legends, cover page, reference citations or tables. Tables and figures may be included in line with the text, or gathered into separate sections at the end. For either option, captions should always accompany each table and figure. The requirement can also be fulfilled with the submission of a Manuscript Alternative (including a 3-5 page addendum) to a peer review journal. Proof of submission is also required, but it does not actually have to be accepted or by a Grant Proposal. It should include an abstract, introduction with hypothesis, materials and methods, discussion, results and references. The cover page is signed by the student, the mentor and the study program director, and must be submitted to the Third Year Coordinator prior to submission of the Thesis. Theses submission dates vary depending on the original starting date of the Scholarly Experience. In addition, instructions and details on the formatting of the thesis are located on the Thesis Requirements section in Duke Box. The thesis will receive a separate grade and number of credits from the research course. The student's third year is not complete until the thesis and cover page have been submitted. Promotion to the fourth year and graduation may be delayed if the thesis is not received on time. Also, students' registration in fourth year clinical courses will be revoked if the thesis is not turned in on time. Credit: 3. *Daniel Laskowitz, MD*

Special Interdisciplinary Training Programs

Anesthesiology, Surgery & Environmental Physiology

ASEP-301B. RESEARCH IN ASEP. Program Director: Richard Moon, MD. The Anesthesiology, Surgery and Environmental Physiology study track provides opportunities for research in cardiovascular and respiratory physiology, molecular pharmacology, neurobiology, surgery, clinical investigation and environmental science. At the beginning of the year each student will define an area of independent study and a hypothesis. ASEP informal group meetings are held during hosted meals. At the end of the year, each student is expected to have completed a project of sufficient merit to warrant presentation and publication. Further, the Departments of Anesthesiology, Surgery, Pediatrics and Medicine offer unique opportunities for students to present their projects in a formal setting moderated by an external reviewer of national stature. A course in Physiology and Medicine of Extreme Environments is also available. FACULTY: Benjamin Alman, MD; Eric Benner, MD; Elliott Bennett-Guerrero, MD; Andrew Berchuck, MD; Todd V. Brennan, MD, MS; Joshua Broder, MD; Anna Mae Diehl, MD; John Freiberger, MD, MPH; Oren Gottfried, MD; Ashraf Samir Habib, MBB; Brant Inman, MD, MSc; Michael James, MD; Madan M. Kwatra, PhD; Sandhya A. Lagoo-Deenadayalan, PhD, MS; Jeffrey H. Lawson, MD, PhD; Howard Levinson, MD; Alexander Limkakeng, MD; Timothy McMahon, MD, PhD; Carmelo Alessio Milano, MD; Richard Moon, MD; Claude Moorman, MD; Paul Mosca, MD; Judd Moul, MD; David Needham, PhD; Andrew Peterson, MD; Claude A. Piantadosi, MD; Thomas Polascik, MD; Glenn M. Preminger, MD; Mark Shapiro, MD; Ranjan Sudan; Jeffrey M. Taekman, MD; David S. Warner, MD; Rebekah White, MD; and David Witsell, MD, MHS

Behavioral Neurosciences Study Program

BSP-301B. RESEARCH IN BSP. Program Director: Richard Moon, MD. The Anesthesiology, Surgery and Environmental Physiology study track provides opportunities for research in cardiovascular and respiratory physiology, molecular pharmacology, neurobiology, surgery, clinical investigation and environmental science. At the beginning of the year each student will define an area of independent study and a hypothesis. ASEP informal group meetings are held during hosted meals. At the end of the year, each student is expected to have completed a project of sufficient merit to warrant presentation and publication. Further, the Departments of Anesthesiology, Surgery, Pediatrics and Medicine offer unique opportunities for students to present their projects in a formal setting moderated by an external reviewer of national stature. A course in Physiology and Medicine of Extreme Environments is also available. FACULTY: James A. Blumenthal, PhD; P. Murali Doraiswamy, MBB; Kafui Dzirasa, MD, PhD; Andrew D. Krystal, MD, MS; Madan Kwatra, PhD; Edward D. Levin, PhD; David J. Madden, PhD; Rajendra Morey, MD, MS; Jeffrey R. Petrella, MD; Andrew Sherwood, PhD; William C. Wetsel, PhD.

Biomedical Engineering and Surgery Study Program

BES-301B. RESEARCH IN BES. Program Director: Bruce Klitzman, PhD (Alternate Director: Farshid Guilak, PhD). This interdepartmental study program is designed to provide third year students with an opportunity to perform laboratory-based research in the broad area of biomedical and tissue engineering and regenerative medicine. It can be either basic science or clinically focused. The program is designed to provide research opportunities to students interested in the quantitative understanding of the physiology of cells, tissues, organs, organ systems, and whole animals, people and populations, as well as the efficacy of various therapies and their delivery. The mentors investigate these areas at the microscopic and macroscopic levels. The course of study may emphasize either the employment of whole animal models or in vitro simulation of disease states. The development and employment of new instrumentation may be a component of the research effort, but not typically its exclusive objective. Emphasis in the student experience is placed upon the teaching of the quantitative method of understanding biological systems. The student is expected to learn to formulate hypotheses, to develop appropriate methods to test such hypotheses and to use statistical methods to draw conclusions from their data. Each student selects a faculty preceptor in consultation with the study program director and an individual research plan is developed. Students who wish to enter this program are not required or expected to have any engineering background. BES has created a new Dual Degree, MD/MEng in the Biomedical Engineering and Surgery Program. The Masters of Engineering (MD/MEng) program allows students to work on development of new technologies or engineering approaches (including optimization/system analysis or feasibility analysis, etc.) for improving healthcare, improving public health, or reducing health hazards. **FACULTY:** Michael Bolognesi, MD; Nenad Bursac, PhD; Jun Chen, PhD; Lewis DeFrate, PhD; Mark Dewhurst, PhD; Mark Easley, MD; Detlev Erdmann, MD, PhD, MHSc; Sina Farsiu, PhD; William Grill, PhD; Farshid Guilak, PhD; Scott Hollenbeck, MD; Bruce Klitzman, PhD; Andrew D. Krystal, MD; Jeffrey H. Lawson, MD, PhD; Kam Leong, PhD; Howard Levinson, MD; Jeffrey Marcus, MD; Barry S. Myers, MD, PhD; James A. Nunley, MD; Steven Arthur Olson, MD; Andrea Beth Taylor, PhD; George A. Truskey, PhD; Tuan Vo-Dinh, PhD; Jennifer West, PhD; Michael Zenn, MD

Radiology, Radiation Oncology, and Medical Physics

RROMP-301B. RESEARCH IN RROMP. This program encourages medical students to explore many exciting research topics in radiology and radiation oncology. These topics span the full range of research, including the following examples:

- Clinical trials and evaluations: PET for adaptive radiotherapy, 3D mammography and breast CT imaging; hyperpolarized gas MRI for lung function; pediatric CT dose reduction; ED imaging utilization; interventional radiology; dynamic contrast enhanced MRI; radiation oncology utilization and optimization
- Translational Science: radiomics and radiogenomics for breast/brain cancer; imaging and predictive modeling of Alzheimer's; intra-operative imaging, functional MRI studies to understand psychological behavior. Basic laboratory science: molecular imaging of stem cells and mouse cardiac function; lung cancer proteomics; MR microscopy; diffusion tensor imaging and brain histology. Students have the opportunity to work with a diverse group of research and clinical faculty from radiology, radiation oncology, surgery, and biomedical engineering. The program strongly emphasizes the use of quantitative methods to solve clinically significant problems. Having prior experience in engineering or physics can be helpful, but the program also welcomes students of all backgrounds. Program students have published in many of the field's top journals: Radiology; AJR American Journal of Roentgenology; Medical Physics; and Int J Radiation Oncology, Biology, Physics.

FACULTY: MD; Rachel Blitzblau, MD; David Brizel, MD; H. Cecil Charles, PhD; Bennett B. Chin, MD; Bastiaan Driehuys, PhD; Will Eward, MD; Sina Farsiu, PhD; Donald Frush, MD; Rajan Gupta, MD; Janet Horton, MD; Scott Huettel, PhD; G. Allan Johnson, PhD; Charles Kim, MD; David G. Kirsch, MD, PhD; Bridget Koontz, MD; Joseph Y. Lo, PhD; Maciej Mazurowski, PhD; Rendon C. Nelson, MD; Edward F. Patz MD; Jeffrey Petrella, MD; James Provenzale, MD; Martin P. Tornai, PhD

Clinical Research Study Program

CRSP-301B. RESEARCH IN CLINICAL RESEARCH. Clinical Research Study Program Co-Directors Vivian Chu, MD and Chad Mather III, MD. MBA This study program offers students the opportunity to explore the quantitative and methodological principles of clinical research. Under the direction of two preceptors, typically a clinical investigator and a statistician, students use the methods and techniques of biostatistics and related disciplines to address a clinical research question. Designated courses may be taken with the approval of the student's preceptors. Students in this study program may apply for admission as degree candidates in the Clinical Research Training

Program, earning a Master of Health Sciences in Clinical Research. FACULTY: Amy Abernethy, MD; John Alexander, MD; Sana Al-Khatib, MD; Rand Allingham, MD; Benjamin Alman, MD; Carlos Bagley, MD; John Bartlett, MD, Daniel K. Benjamin, MD, PhD, MPH; Andrew Berchuck, MD; Michael Bolognesi, MD; Hayden Bosworth, PhD; Thomas Burks, MD; Robert M. Califf, MD; Blanche Capel, PhD; Marc G. Caron, PhD Harvey Cohen, MD; Megan Clowse, MD; Harvey Cohen, MD; Michael Cohen-Wolkowicz, MD; Leonor Corsino, MD, FACE, MHS; Christopher Counter, PhD; James Daubert, MD; Lou DeFrate, PhD; David Edelman, MD; William Eward, MD; Deborah Fisher, MD; Vance Fowler, MD, MHS; Neil J. Freedman, MD; John Freiberger, MD, MPH; Henry Friedman, MD; Karen Frush, MD; Anthony Galanos, MD; Geoffrey Steven Ginsburg, MD, PhD; Oren Gottfried, MD; Farshid Guilak, PhD; Michael D. Gunn, MD; William Edward Hammond, PhD, Barton Ford Haynes, MD; Mitchell Todd Heflin, MD; Adreian Felipe Hernandez, MD; Janet Horton, MD; Glenn J. Jaffe, MD; Wei Jiang, MD; Chad Kessler, MD; Raymond J. Kim, MD, MS; Warren Kinghorn, MD, DVM; Bruce M. Klitzman, PhD; Christopher D. Kontos, MD; William Kraus, MD; Madan Mohan Kwatra, PhD; Nandan Lad, MD, MHS; Sandhya A. Lagoo-Deenadayalan, PhD, MS; Robert J. Lefkowitz, MD; Howard Levinson, MD; David Joseph Madden, PhD; David B. Matchar, MD; Richard C. Mather, III, MD; James McNamara, MD; Mohamed Mikati, MD; Carmelo Alessio Milano, MD; Richard Moon, MD; Patricia Griпка Moorman, PhD, MSPH; Andrew Joseph Muir, MD; Amy P. Murtha, MD; Rendon Nelson, MD; Laura Kristen Newby, MD; Steven Olsen, MD; Truls Ostbye, MD, MHS; Edward Patz, MD; Sallie Permar, MD, PhD; Eric Peterson, MD; Jeffrey Petrella, MD; Claude Anthony Piantadosi, MD; Johnathan Piccini, MD, MHSc; Geoffrey Pitt, MD, PhD; Mihai V. Podgoreanu, MD; Dawn Provenzale, MD; James Provenzale, MD; David Alan Rizzieri, MD; Howard Rockman, MD; Paul Rosenberg, MD; John Sampson, MD, PhD; Devdutta Sangvai, MD; Patrick Seed, MD, PhD; Victoria Seewaldt, MD; Mina Silberberg, PhD; Ralph Snyderman, MD; Julie Sosa, MD; Gopal Sreenivasan, PhD; Mary Sunday, MD, PhD, BS; Laura Svetkey, MD; Geeta Swamy, MD; Marilyn Jo Telen, MD; Cynthia Toth, MD; James A. Tulsky, MD; Peter Ubel, MD; David Walmer, MD, PhD; Emmanuel B. Walter, MD, MHS; Heather Whitson, MD; John Wiley Williams, MD, and Ruth Quillian Wolever, PhD, MS; Yunyan Zhang, PhD.

Cardiovascular Study Program

CVS-301B. RESEARCH IN CVS. Program Director: Neil J. Freedman, MD. This interdepartmental study program is designed to provide third year medical students with an in-depth basic science research experience in one area of the broad discipline of cardiovascular science. The program is directed at those students potentially interested in a career in cardiovascular research. Faculty members in this study track come from numerous departments, including Medicine, Biochemistry, Cell Biology, Immunology, Pathology, and Pharmacology and Cancer Biology. Students who elect this study program undertake a research project in a laboratory under the guidance of a faculty preceptor. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Because a wide range of research opportunities is available, course work is individually tailored by the faculty preceptor to the interests of the student.

Epidemiology and Public Health Study Program

EPH-301B. RESEARCH IN EPI & PUBLIC HEALTH. Program Director: Kathryn M. Andolsek, MD, MPH.

The Epidemiology and Public Health Study Program is designed for students pursuing third year opportunities in public health through obtaining a Masters of Public Health degree.

It combines formal coursework in epidemiology and population health, allowing students an opportunity to participate in the research design and/or analysis of a research study. Participants will practice skills related to research design, statistical analyses, assessment, health policy, and comparative effectiveness so that they can be effective contributors to improve the system of health care. The focus may be on improved health of the patient or a discrete population but should be transferable to local, state, national and/or global health issues. Each student selects a Duke Faculty mentor in consultation with the study track director.

Eligibility. Students enrolled in the School of Medicine, after satisfactory completion of the first two years of the regular curriculum, may seek a Master of Public Health degree at the University of North Carolina- Chapel Hill (or an alternate accredited school of public health.)

Required Research: Each student will have the equivalent of 10-12 months' participation in research. Students should identify a mentor, and research topic by Spring of the year in which they begin their third year. Ideally, Duke IRB approval is obtained at the same time recognizing that IRB approval is usually necessary through both Duke and other pertinent institutions. Coursework continuously informs their research project. Each student will be required to produce an in-depth thesis analyzing an area of epidemiology, health service research, finance, health systems, or

health policy. This research activity extends throughout the year, culminating with the acceptance of the completed thesis, grant or manuscript consistent with Duke third year requirements.

This study track is for students participating in an MPH. For MPH students, the student must apply to the relevant MPH school (and program within the school) and to Duke School of Medicine by completing the Duke Third Year Elective Form.

For students who plan to apply for an MPH at the University of North Carolina, School of Public Health: There are currently 5 “pre-approved” MPH programs at the School of Public Health. These include Epidemiology; Health Care and Prevention; Health Policy, Maternal and Child Health and Nutrition. The amount of tuition will depend on whether a student is determined to meet UNC’s “in state for tuition purposes” criteria and applies accordingly. Interested students should do what they can to maximize their ability to meet these criteria as soon as they believe they have an interest. This determination is made semester by semester. For details see: <http://gradschool.unc.edu/student/residency>.

Students interested in another study track at the School of Public at UNC, or an MPH at another University, must work with Dr. Andolsek to petition the Duke third year committee for “acceptance.” Students complete all requirements for the MPH degree during one-two academic years as part of fulfilling their third year requirement. If interested, they can extend their research for an additional year. At the end of the students’ third year, they are required to submit a quantitative thesis/manuscript/grant application and present their findings orally at a suitable venue to satisfy Duke’s third year requirements, in addition to the requirements of their masters. Upon receipt of the MPH degree and completion of a quantitative thesis, students are awarded a full year of basic science credit toward the MD degree. Students should consult the UNC School of Public Health for information on eligibility, application requirements and deadlines, and course requirements of the degree. Most students are successful in obtaining this degree but it takes a great deal of organization, coordination, and proactive effort. Students may also work with in the field of public health (but without pursuing a second degree) through the Clinical Research Study Track, headed by Dr. Vivian Chu, in Global Health, with Dr. Dennis Clements, or in an area of qualitative research through the Medical Humanities study tract, headed by Dr. Margaret Humphreys. In addition, students may propose an individually tailored Study Away option. Students interested in the MPH may want to compare and contrast this opportunity with Masters of Public Policy or Masters of Health Sciences (through CRTP) with Dr. David Edelman. Another opportunity is the Masters of Business Administration (Study track director, Chad Mather, III, MD, MBA). Review and approval is on individual basis is made by the Third Year Committee. Placement at the National Institute of Environmental Health Sciences (NIH/NIEHS) in Research Triangle Park is an option; contact William Schrader at schrader@niehs.nih.gov or (919) 541-3433.

Faculty from a number of study programs provide supervision of students in the study away programs. Tuition: All students are responsible for both Duke SOM third year tuition and the tuition for their MPH degree. This policy is subject to change. For additional information on the MPH program, contact the Director of the MD/MPH Program, Kathryn Andolsek, MD, MPH; Assistant Dean, Premedical Education in the School of Medicine; DUMC Box 3648, 201 Trent Dr. 0159 Duke South Orange Zone, Durham, North Carolina 27710, (919) 668-3883, kathryn.andolsek@duke.edu (Reviewed April 2010). FACULTY: Kathryn M. Andolsek, MD, MPH; John Bartlett, MD, Lori A. Bastian, MD, MPH; Daniel G. Blazer, MD, PhD; Michael Bolognesi, MD; Haywood Brown, MD; Barbara J. Burns, PhD; Robert M. Califf, MD; Pratap Challa, MD; Dennis A. Clements, MD, PhD, MPH; Harvey Cohen, MD; Leslie H. Curtis, PhD; Geraldine Dawson, PhD; John M. Dement, PhD; David Edelman, MD; Christopher Edwards, PhD; Jeffrey Ferranti, MD, MS; Sharon Freedman, MD; William Fulkerson, MD; Anthony Galanos, MD; Deborah T. Gold, PhD; Carol Dukes Hamilton, MD; Judith C. Hays, PhD; Margaret Humphreys, MD, PhD; Samuel L. Katz, MD; Alex R. Kemper, MD, MPH, MS; Linda Kinsinger, MD; Jeffrey Lawson, MD, PhD; Paul Lee, MD, J.D.; Phyllis Leppert, MD, PhD; Hester Lipscomb, PhD, MPH; Elizabeth Livingston, MD; David Lobach, MD, PhD, MS; Anne Lyerly, MD; David B. Matchar, MD; James Lloyd Mitchener, MD; Eugene W. Moretti, MD; Evan R. Myers, MD, MPH; Steven Olson, MD; Truls Ostbye, MD, MPH; George Parkerson, MD, PhD; Edward Patz, MD; William James Richardson, MD; John Sampson, MD, PhD; Joellen M. Schildkraut, PhD, MPH; Kevin A. Schulman, MD, M.B.A.; William Scott, PhD; Mina R. Silberberg, PhD; David L. Simel, MD; Frank Sloan, PhD; Anthony So, MD; Laura Svetkey, MD; Geeta K. Swamy, MD; Marvin Swartz, MD; Nathan Thielman, MD, MPH; James A. Tulskey, MD; David K. Walmer, MD, PhD; Emmanuel Walter, MD, MPH; Eric Westman, MD, MHS; David Witsell, MD, MHS; Christopher Woods, MD

Global Health Study Program

GHS-301B. GLOBAL HEALTH STUDY PROGRAM. Program Director: Dennis Alfred Clements, MD, PhD, MPH. The Global Health Study Program (GHSP) was approved in February 2008 to meet the growing demand from Duke medical students for a centralized resource for information, mentors, funding, and research opportunities related to Global Health (GH). In collaboration with the Duke Global Health Institute (DGHI), the GHSP facilitates connections for students with research opportunities at one of Duke's international GH field sites, as well as with other locations offering appropriate opportunities. Currently, DGHI is collaborating with institutions in China, Haiti, India, Kenya, Singapore, Tanzania, and Uganda, and is pursuing collaborative partnerships in Costa Rica, Ghana, Honduras, Indonesia, Nicaragua, Sri Lanka, Thailand, and others. The Institute focuses on six signature research initiatives with global reach. The program also connects students to Duke faculty with GH expertise, such as those whose research focuses on infectious diseases, epidemiology, clinical microbiology, translational medicine and social science. The Global Health Study Program, as with all Third Year Study Programs, requires a thesis that demonstrates quantitative expertise, regardless of the discipline chosen. Students will work with a project mentor, as well as a Duke Faculty member, to develop and conduct research that is of benefit both to the international site and to the educational goals of the student. DGHI and SOM have developed processes for consolidating and disseminating information about past students Study Away experiences. They also vet various funding opportunities for international fieldwork and research and will be active in evaluating the qualifications of international mentors involved in supporting students undertaking the GH study program. For more information please contact the GH Third Year Study Program Coordinator. Limited funding will be available for Third Year students undertaking research projects related to global health. While preference will be given to students participating in the GH Study Program and working at DGHI field sites, all relevant proposals will be considered. DGHI and SOM collaborate to provide predeparture orientation and academic support while students are abroad. Please contact the GH Third Year Study Program Coordinator, Laura Bey, laura.bey@duke.edu, to learn more. FACULTY: John Bartlett, MD; Dennis Clements, MD, PhD, MPH; John A. Crump, M.B.B.; John M. Dement, PhD; Sandhya Anand Lagoo-Deenadayalan, PhD, MS; David F. Lobach, MD, PhD, MS; David B. Matchar, MD; Michael H. Merson, MD; James L. Michener, MD; Truls Ostbye, MD, MPH; Kevin Schulman, MD, M.B.A.; Svati Hasmukh Shah, MD, MHS; Mina Ruth Silberberg, PhD; Ralph Snyderman, MD; Nathan M. Thielman, M.D, MPH; David K. Walmer, MD, PhD; Christopher Woods, MD; Yousuf Zafar, MD

Human Genetics and Genomics Study Program

HGP-301B. RESEARCH IN HGP. Program Director: Elizabeth Rebecca Hauser, PhD. Our genetic makeup plays a large role in dictating our health. With our improved knowledge of human genetic and genomic variation, we have tremendous opportunity to dissect the genetic determinants of human diseases such as heart disease, psychiatric conditions, cancer and osteoarthritis to name a few. Once these genetic contributions are understood, the physician will have a powerful means at his or her disposal for realizing personalized medicine by identifying individual risk factors and offering lifestyle modifications. The study program in human genetics offers third year medical students an integrated program for understanding research in human genetics, its application to human genetic disease for risk assessment, genetic counseling, public health practice, and potential therapeutics, and ethical and legal implications for this research on the patient, the family, and society. We anticipate that students in this program will follow one of several broad paths, utilizing either a molecular approach or a statistical and epidemiologic approach to understanding and treating human genetic disease. Research opportunities are available in laboratories studying such diverse topics as positional cloning of human disease genes, apoptosis gene therapy, biochemical genetics, animal models of genetics and development, epigenetics, and genetic epidemiology. Opportunities for both basic science and clinical/epidemiologic research projects are available in various laboratories participating in the HGP, and these opportunities spill all specialties of medicine. In addition to the research project and thesis, the program requirements include a year-long seminar series targeting current topics in human genetic research. Other elective courses may be taken with the permission of the program director and the student's preceptor. FACULTY: Allison Ashley-Koch, PhD; Blanche Capel, PhD; Jen-Tsan Ashley Chi, MD, PhD; Robert Cook-Deegan, MD; Rasheed Gbadegesin, MD; Elizabeth R. Hauser, PhD; Michael A. Hauser, PhD; Yong-Hui Jiang, MD, PhD; Priya S. Kishnani, M.B.B.; Dwight D. Koeberl, MD, PhD; Virginia B. Kraus, MD, PhD; Douglas Marchuk, PhD; Thomas Petes, PhD; Mihai V. Podgoreanu, MD; Svati Shah, MD, MHS; Bruce Sullenger, PhD; Deepak Voora, MD; Qingyi Wei, MD, PhD

Master of Science of Library Science Study Program

MSLS-301B. MASTER OF LIBRARY SCIENCE STUDY PROGRAM. Director: Patricia L. Thibodeau, MLS, MBA. This dual degree program allows students interested in information management, information technology, and the development of evidence-based resources to further explore the role of information in the clinical setting. Through the dual-degree program, students will be able to integrate their clinical knowledge with the information skills and concepts found in the library and information sciences studies curricula. In the future these medical informationists will be able to contribute to the development, selection, and delivery of high quality information that is relevant to the clinical setting and patient care.

MSIS-301B. MASTER OF SCIENCE OF INFORMATION SCIENCE STUDY PROGRAM. Director: Patricia L. Thibodeau, MLS, MBA. This dual degree program allows students interested in information management, information technology, and the development of evidence-based resources to further explore the role of information in the clinical setting. Through the dual-degree program, students will be able to integrate their clinical knowledge with the information skills and concepts found in the library and information sciences studies curricula. In the future these medical informationists will be able to contribute to the development, selection, and delivery of high quality information that is relevant to the clinical setting and patient care. **FACULTY:** Jeffrey P. Baker, MD, PhD; Raymond Barfield, MD, PhD; Robert Cook-Deegan, MD; Peter C. English, MD, PhD; Margaret Humphreys, MD, PhD; Anne Lysterly, MD; Ross McKinney, MD; Philip Rosoff, MD; Svati Hasmukh Shah, MD, MHS; Gopal Sreenivasan, PhD; James A. Tulsky, MD

Masters in Management in Clinical Informatics

MMCI-301B. RESEARCH IN MMCI. The Master of Management in Clinical Informatics (MMCI) is offered by Duke's Fuqua School of Business. The program is designed to: train informaticians and health professionals to thoughtfully apply technology in order to improve the performance of providers, payers, and regulators; to enhance patient care; and to promote the translation of scientific discovery into clinical practice; provide insight into the interaction and interdependencies of informatics, advanced analytics, process improvement methodology, and business management principles; hone functional skills and the ability to think strategically in a global business environment, allowing the immediate application of new-won knowledge and skills; and, enhance opportunities for professional roles in a variety of health arenas, from payer and health systems to biomedical research and development.

Medical Humanities Study Program

MEDHUM-301B. RESEARCH IN MEDHUM. Program Director: Margaret Humphreys, MD, PhD. Overview: The Medical Humanities Study Program offers a multidisciplinary opportunity for students to explore topics in medical history, ethics, theology, and other fields within the medical humanities. Students design their own research projects under the guidance of medical humanities mentors, and tailor their third year experience around the completion of this project. While some students may participate in their mentor's ongoing research, others can pursue projects independent of (but related to) their mentor's primary areas of interest. Curriculum: Research. The principal component of the Medical Humanities Study Program is an in-depth research experience within the medical humanities. The location of this research will vary with the mentor and project chosen. Some projects may be appropriately pursued in libraries and archives. Others may include interviews with or experimentation upon human subjects in the clinical or other academic setting. Like their peers in the more traditional science track, medical humanities students will explore a research question, find data to support or refute it, and write a thesis that communicates their results. Proposal: All students are expected to prepare a 3-5 page proposal by the end of spring of the second year outlining the aims of the proposed research in consultation with their chosen mentor. This proposal will state the problem to be studied, the rationale and relevance of the problem, and include a bibliography of relevant literature and sources. Courses: Students are expected to take at least 4 courses in the medical humanities during their third year. Working with their mentor, students will identify courses within the university relevant to their research question. Courses may be chosen from the Medical School, Divinity School, or Faculty of Arts and Sciences. Individual readings courses with the mentor or other faculty may be included in the courses chosen. Lecture series: Students will attend the regular humanities lecture series offered through the Center for the Study of Medical Ethics and Humanities. Posters: Students are expected to submit abstracts to present results in poster or oral format at the annual Alpha Omega Alpha research day in the Searle Center that will be held each year on the first Friday in August. Final thesis: Students will prepare a thesis that represents the product of their research, usually 20-25 pages in length. This is due on the thesis deadline date set by the Registrar's Office. Presentations: Students are expected to

present a paper based on their research to the humanities lecture series during the spring semester. Publication: Students are encouraged to produce work that is of sufficient originality, importance, and quality that it will be accepted for publication by a relevant medical humanities journal. Authors of historical theses will be encouraged to submit their work for the William Osler Prize awarded by the American Association of the History of Medicine for the best essay by a medical student. The winning essay of this prize contest is traditionally published in the Bulletin of the History of Medicine. FACULTY: Jeffrey P. Baker, MD, PhD; Raymond Barfield, MD, PhD; Robert Cook-Deegan, MD; Farr Curlin, MD; Nita Farahany, PhD; Margaret Humphreys, MD, PhD; Warren Kinghorn, MD, DVM; Ross McKinney, MD; Svati Shah, MD, MHS; Gopal Screenivasan, PhD; James A. Tulsky, MD; Peter Ubel, MD

Microbiology, Infectious Disease and Immunology Study Program

MIDIP-301B. RESEARCH IN MICROBIOLOGY AND INFECTIOUS DISEASE STUDY PROGRAM.

Program Director: James Andrew Alspaugh, MD. Knowledge of infectious diseases and immunology is central to the effective management of disease in a vast array of public health and clinical settings. The Microbiology, Infectious Diseases, and Immunology Program (MIDIP) provides students with the opportunity to explore various aspects of infectious diseases and immunology in laboratory or clinical settings. For example, MIDIP will appeal to students interested in the public health initiatives of vaccine design and the management of infectious diseases. Duke University has many world leaders in the study of microbiology and immunology, many of whom have a tradition of outstanding mentorship for third year medical students. The MIDIP research experience can be focused on one of a wide variety of important clinical problems. Aberrations of immune system development can be studied using animal models of primary or acquired immunodeficiencies. Diseases of chronic inflammation and autoimmunity highlight the damaging effects of exaggerated or inappropriate immune responses and can be examined through research focused on the pathogenesis of diseases such as asthma and rheumatoid arthritis. Modulation of normal immune responses is also critical to the management of solid organ and bone marrow transplantation and is becoming increasingly important in the treatment of cancer. Faculty mentors at Duke also have outstanding research programs studying the molecular mechanisms of microbial pathogenesis in bacterial, fungal, and viral systems. Microbial genetics can be exploited to investigate fundamental processes in genetics and molecular biology. The development of novel chemotherapies for microbial infections, particularly of prevalent or emerging infections, remains a high priority for public health. The student may also choose to undertake research pertinent to the many molecular processes that underlie normal lymphocyte development and function, and use this opportunity to master some of the new technologies available to biomedical research. The MIDIP emphasizes original research. This program offers third year medical students an opportunity to undertake basic research and to integrate with graduate students, fellows, and faculty of the Medical Center departments contributing to this Program. Each student will select a faculty mentor, and together they will develop an original proposal within the context of the mentor's ongoing research program. The student will be expected to design experiments, critically assess the relevant literature, evaluate data, apply appropriate statistical tests, solve problems associated with the project, and communicate the research results in written and oral presentations. The faculty and staff will provide appropriate guidance and assistance within the laboratory or clinical setting. FACULTY: Alejandro Aballay, PhD; J. Andrew Alspaugh, MD; John A. Bartlett, MD; Daniel K. Benjamin, MD, PhD, MPH; Jen-Tsan Ashley Chi, MD, PhD; Colleen Cunningham, MD; Vance Fowler, MD, MHS; Michael M. Frank, MD; Richard Frothingham, MD; Mariano A. Garcia-Blanco, MD, PhD; Michal Dee Gunn, MD; Russell P. Hall, MD; Barton Ford Haynes, MD; Joseph Heitman, MD, PhD; Maureane Richardson Hoffman, MD, PhD; Sue Jinks-Robertson, PhD; Jack D. Keene, PhD; Garnett H. Kelsoe, PhD, MS; Joanne Kurtzberg, MD; Micah Luftig, PhD; Micah McClain, MD, PhD; M. Anthony Moody, MD; Michael Aaron Morse, MD; John R. Perfect, MD; Sallie Permar, MD, PhD; Thomas Petes, PhD; David J. Pickup, PhD; David S. Pisetsky, MD, PhD; David Ruch, MD; Patrick Casey Seed, MD, PhD; Herman F. Staats, PhD; William J. Steinbach, MD; Geeta Swamy, MD; Gregory Taylor, PhD.; Marilyn Jo Telen, MD; Nathan M. Thielman, MD, MPH; David Tobin, PhD; Georgia Tomaras, PhD; Raphael Valdivia, PhD; Joe Brice Weinberg, MD; Christopher Woods, MD, MPH; Aimee Zaas, MD; Xiaoping Zhong, MD, PhD

Molecular Medicine

This interdepartmental study program is designed to provide third year medical students with an in-depth basic science or translational research experience in oncological sciences, regenerative medicine, the nutritional and metabolic mechanisms of chronic disease or the molecular basis of disease. Faculty members in this study track come from numerous departments, including Medicine, Biochemistry, Cell Biology, Immunology, Pathology, and

Pharmacology and Cancer Biology. Students who elect this study program undertake a research project in a laboratory under the guidance of a faculty preceptor and participate in appropriate seminar series. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Due to the wide range of research opportunities available, course work is individually tailored to the interests of the student by the faculty preceptor. There are four (4) discreet sub tracks to accommodate the diversity of interest in Molecular Medicine.

MOLMED-301B. RESEARCH IN MOLMED - ONCOLOGICAL SCIENCES. This interdepartmental study program is designed to provide third year medical students with an in-depth basic science or translational research experience in oncological science. Faculty in the study program are engaged in investigating oncogenes, tumor suppressor genes, growth factors, chromosomal abnormalities, cellular invasion and metastases, proliferation, differentiation, apoptosis, tumor hypoxia, tumor angiogenesis, chemical/radiation/viral carcinogenesis, biologic and immunotherapy principles, radiobiology and hyperthermic oncology, and the pharmacology of cancer chemotherapy. The program is directed at students potentially interested in a career in oncology and cancer research. Faculty members in this study track come from numerous departments, including Medicine, Biochemistry, Cell Biology, Immunology, Pathology, and Pharmacology and Cancer Biology. Students who elect this study program undertake a research project in a laboratory under the guidance of a faculty preceptor and participate in appropriate seminar series. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Due to the wide range of research opportunities available, course work is individually tailored to the interests of the student by the faculty preceptor. FACULTY: Oren Becher, MD; Andrew Berchuck, MD; Gerard Blobe, MD, PhD; Christopher Counter, PhD; Sandeep Dave, MD, MS; Mark Dewhirst, PhD; Matthias Gromeier, PhD; David Hsu, MD, PhD; Michael Kelley, MD; David Kirsch, MD, PhD; Sally Kornbluth, PhD; Joanne Kurtzberg, MD; Jeffrey Marks, PhD; Susan Murphy, PhD; Joseph Nevins, PhD; Edward Patz, MD; Anne Marie Pendergast, PhD; Sal Pizzo, MD, PhD; John Howard Sampson, MD, PhD; Victoria Seewaldt, MD; Daniel Wechsler, MDC., PhD; Hai Yan, MD, PhD; Tso-Pang Yao, PhD; Yunyan Zhang, PhD

MOLMED-302B. RESEARCH IN MOLMED - REGENERATIVE MEDICINE. This interdepartmental study program is designed to provide third year medical students with an in-depth basic science or translational research experience in the fields of developmental and stem cell biology. Faculty in the study program are engaged in investigating mechanisms of embryonic development, developmental genetics, stem cells in various tissues from both humans and model organisms, the factors that regulate the balance between stem cell self-renewal and differentiation, the stem cell niche, the role of cancer stem cells in human cancer and the use of stem cells for therapy. The program is directed at students potentially interested in a career in regenerative medicine. Faculty members in this study track come from numerous departments, including Medicine, Biochemistry, Cell Biology, Pediatric, Pharmacology and Cancer Biology and Radiation Oncology. Students who elect this study program undertake a research project in a laboratory under the guidance of a faculty preceptor and participate in appropriate seminar series. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Due to the wide range of research opportunities available, course work is individually tailored to the interests of the student by the faculty preceptor. FACULTY: Andrew Berchuck, MD; Gerard Blobe, MD, PhD; Blanche Capel, PhD; Christopher Counter, PhD; Mark Dewhirst, PhD; Matthias Gromeier, PhD; Michael Kelley, MD; David Kirsch, MD, PhD; Sally Kornbluth, PhD; Joanne Kurtzberg, MD; Jeffrey Marks, PhD; Joseph Nevins, PhD; Edward Patz, MD; Anne Marie Pendergast, PhD; Sal Pizzo, MD, PhD; Victoria Seewaldt, MD; Daniel Wechsler, MDC, PhD; Tso-Pang Yao, PhD; Yunyan Zhang, PhD

MOLMED-303B. RESEARCH IN MOLMED - MOLECULAR BASIS OF DISEASE. This interdepartmental study program is designed to provide third year medical students with an in-depth basic science or translational research experience in defining molecular mechanisms that underlie biological processes, using an integrated approach that combines chemistry, enzymology, biophysics, structural biology, computational biology, cell biology and genetics. Faculty members in this study track come from numerous departments, including Biochemistry, Cell Biology, Medicine, Microbiology and Medical Genetics, Pathology, and Pharmacology and Cancer Biology. Students who elect this study program undertake a research project in a laboratory under the guidance of a faculty preceptor and participate in appropriate seminar series. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Due to the wide range of research opportunities available, course work is individually tailored to the interests of the student by the faculty preceptor. FACULTY: Perry Blackshear, MD, PhD; Gerard Blobe, MD, PhD; Thomas Myron Coffman, MD; Christopher Counter, PhD; Joseph Heitman, MD, PhD; Sally Kornbluth, PhD; Madan Kwatra, PhD; Roger Liddle, MD;

Hiroaki Matsunami, PhD; Christopher Nicchitta, PhD; Thomas L. Ortel, MD, Anne Marie Pendergast, PhD; Thomas Petes, PhD; Geoffrey Pitt, MD, PhD; Tso-Pang Yao, PhD; Yunyan Zhang, PhD

MOLMED-304B. RESEARCH IN MOLMED-NUTRITIONAL & METABOLIC MECHANISMS OF CHRONIC DISEASES. This interdepartmental study program is designed to provide third year medical students with an in-depth basic science or translational research experience in nutritional and metabolic mechanisms involved in the pathogenesis of chronic diseases. Faculty in the study program is engaged in investigating fundamental nutritional and metabolic regulatory mechanisms, including application of comprehensive metabolic analysis tools (“metabolomics”) for the diagnosis and treatment of individuals with chronic diseases. Faculty members in this study track come from numerous departments, including Biochemistry, Cell Biology, Medicine, Microbiology and Medical Genetics, Pathology, and Pharmacology and Cancer Biology. Students who elect this study program undertake a research project in a laboratory under the guidance of a faculty preceptor and participate in appropriate seminar series. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Due to the wide range of research opportunities available, course work is individually tailored to the interests of the student by the faculty preceptor. FACULTY: Nancie MacIver, MD, PhD; Larry Moss, MD; Deborah Muoio, PhD; Jeffery Rathmell, PhD

MOLMED-305B. RESEARCH IN MOLMED-TRANSLATIONAL PHARMACOLOGY.

Study Program Co-Directors, [J. Victor Nadler, PhD](#), [Robert Noveck, MD, PhD](#)

This interdepartmental study program is designed to provide third year medical students with an in-depth translational research experience in drug development and early-stage clinical drug testing. Faculty in the study program either is, or has been engaged in preclinical drug development or in Phase I/IIA clinical testing. The program is directed at students potentially interested in making drug development a component of their future career. Faculty members in this study track come from numerous departments, including Pharmacology and Cancer Biology, Neurobiology, Medicine, Pediatrics, Radiation Oncology, Anesthesiology, Radiology, Surgery, and Biomedical Engineering. Students who elect this study program either undertake a research project in a laboratory under the guidance of a faculty preceptor or design or execute a component of a Phase I/IIA clinical trial. Students are expected to view the Principles of Clinical Pharmacology course offered online by the NIH Clinical Center and to participate in presentations and discussions of issues discussed in this course as their time permits. In addition, with the permission of their mentor and study program director, students may take course work each term to complement their research interests. Due to the wide range of research opportunities available, course work is individually tailored to the interests of the student by the faculty preceptor. FACULTY: Ines Batinic-Haberle PhD; Oren Becher, MD; Daniel K. Benjamin, MD, PhD, MPH; Christopher Kontos, MD; Sally Kornbluth, PhD; Madan Kwatra, PhD; Daniel Todd Laskowitz, MD; Robert J. Lefkowitz, MD; Kam Leong, PhD; James McNamara, MD; Paul Mosca, MD; Edward Patz, MD; Edward Patz, MD; John Howard Sampson, MD, PhD; Bruce Sullenger, PhD; Emmanuel B. Walter, MD, MHS; David S. Warner, MD

Neurosciences Study Program

NSS-301B. RESEARCH IN NSS. Program Director: Christopher Lascola, MD. Overview: The Neurosciences Study Program provides a multidisciplinary opportunity for third year medical students over the broad range of basic and clinical neurosciences. Many of the most intractable and prevalent diseases of our time afflict the nervous system, and in many ways research in the neurosciences represents one of the final frontiers of medicine and biomedical science. Areas of study range from molecular and cellular neuroscience, neuroimaging, developmental neurobiology, systems and cognitive neuroscience to translational neuroscience such as animal modeling of neurological disease and development of potential therapeutics. Faculty in the program are drawn from many departments including Neurobiology, Radiology, Pharmacology, Cell Biology, Psychology, Neurosurgery, Neurology, Pediatrics, Medicine, Psychiatry, and Ophthalmology, and are engaged in research that ranges from fundamental properties of ion channels and neurotransmitter receptors to cognition and perception. The program emphasizes a basic research experience under the guidance of a mentor along with opportunities to attend seminars and present results in written, oral, and poster presentations. Research: The basic component of the Neurosciences Study Program is an in-depth research experience in a research laboratory under the supervision of one of the participating faculty. Students will work full-time in a laboratory pursuing an independent research project including conducting experiments, analyzing results, and communicating findings. Proposal: All students are expected to prepare a 2-3 page proposal by the beginning of the third year, outlining the aims of the proposed research in consultation with their chosen mentor. This proposal

should state the problem to be studied, the rationale and relevance of the problem, the specific hypotheses to be tested, a brief description of the experiments to be performed, and references. In addition, Vascular, Neurology, Neurosurgery, and Stroke Center conferences can also be attended. Importantly, there are no specific course requirements in the Program, but rather students may pursue their own particular interests by taking or auditing courses recommended by their mentor or relevant to their research project. Seminars: Students will be able to attend regular seminar series including the Division of Neurology Research Seminar, the Neurobiology Seminar, Signal Transduction Colloquium, Cell Biology Seminar, and Brain Imaging Seminar as appropriate for their particular research project. Attendance at research seminars is encouraged. Meetings: Students will attend monthly informal meetings with Dr. Lascola to discuss proposed research plans, ongoing projects and career development issues. Students will be encouraged to present and discuss data. Outside speakers may also be invited to discuss particular topics of interest. Posters: Students are expected to submit abstracts to present results in poster or oral format at the annual Alpha Omega Alpha research day held in August. Final Thesis: Students are required to write a description of their hypotheses, the outcome of their experiments, and conclusions of their work (15-25 pages). FACULTY: James Burke, MD, PhD; Nicole Calakos, MD, PhD; Carol Colton, PhD; Sharyn Anne Endow, PhD; Kirby Gottschalk, PhD; Warren M. Grill, PhD; Michael M. Haglund, MD, PhD; Scott Huettel, PhD; Michael James, MD; Erich Jarvis, PhD; Yong-Hui Jiang, MD, PhD; Nandon Lad, MD, PhD; Christopher David Lascola, MD, PhD; Daniel Todd Laskowitz, MD; Donald C. Lo, PhD; James McNamara, MD; Mohamed Mikati, MD; Jeffrey M. Petrella, MD; Geoffrey Pitt, MD, PhD; Michael L. Platt, PhD; James M. Provenzale, MD; Allen D. Roses, MD; John H. Sampson, MD, PhD; Marty G. Woldorff, PhD

Ophthalmology and Visual Sciences Study Program

OVS-301B. RESEARCH IN OVS. Study Program Director: Catherine Bowes Rickman, PhD. The development of the next generation of clinician-scientists is a high priority of the educational mission of the Department of Ophthalmology. To achieve this goal, the faculty offer a wide scope of research opportunities to third year medical students. These range from intense, hands-on experience in molecular and cell biology, to animal surgery, to clinical prospective and retrospective studies. The student, in addition to being closely mentored by an individual faculty member, is encouraged to participate in the vast array of departmental research and clinical seminars, lectures and tutorials. These activities offer an intensive learning environment and provide a solid foundation from which to launch a successful career bridging basic and clinical sciences with the practice of medicine. FACULTY: Robert Rand Allingham, MD.; Vadim Y. Arshavsky, PhD.; Sanjay Asrani, MD; Catherine Bowes Rickman, PhD; Edward G. Buckley, MD; Pratap Challa, MD; Scott W. Cousins, MD; Glenn J. Jaffe, MD; Anthony Kuo, MD; Paloma Liton, PhD; Goldis Malek, PhD; Kelly Muir, MD; P. Vasanth Rao, PhD; William Stamer, PhD; Cynthia A. Toth, MD

Pathology Study Program

PSP-301B. RESEARCH IN PSP. Program Director: Mary E. Sunday, MD, PhD Pathology is the study of disease through the utilization of structural and functional changes to gain information about the human organism's response to injury. The goal of the Pathology Study Program is to provide the medical student with a thorough learning experience in pathology and laboratory medicine under the guidance of a senior faculty preceptor. The essential elements of this program are: a) independent, but guided, research experience (bench or library), and b) active participation in small group seminars. FACULTY: Soman N. Abraham, PhD, MS; Darell D. Bigner, MD, PhD; Blanche Capel, PhD; Dennis A. Clements, MD, PhD, MPH; Sheila Collins, PhD; Michael Datto, MD; Mark W. Dewhirst, PhD; Laura Pope Hale, MD, PhD, MS; Maureane Hoffman, MD, PhD; Virginia B. Kraus, MD, PhD; Anand Lagoo, MD, M.B.B., PhD; Herbert K. Lyerly, MD; Roger McClendon, MD; Sara E. Miller, PhD; Salvatore V. Pizzo, MD, PhD; Herman Ford Staats, PhD; Mary Elizabeth Anne Sunday, MD, PhD

Pediatrics

PEDS-301B. JOURNALOLOGY: ANATOMY AND PHYSIOLOGY OF PEER-REVIEWED PUBLICATIONS. This non-credit bearing seminar is designed to provide students with a practical understanding of the publication process with an overarching goal of helping students prepare their third-year projects for submission. Issues to be addressed will be how to target a journal, how to understand the author instructions, and how to prepare a manuscript with the greatest likelihood of publication. The interactive seminar will last for eight sessions, with optional additional sessions as requested by the students. Students are required to complete at least six sessions in order for the course to appear on the student's transcript. Course offered during Spring Term. Contact Dr. Alan Kemper at alex.kemper@dm.duke.edu for class dates and for more information. Credit: 0 Enrollment: Max 10 Min 5. Alex Kemper, MD

Doctor of Physical Therapy



DPT Faculty

Chief: Michel D. Landry, BScPT, PhD

Robert Butler, PT, DPT, PhD; Laura Case, PT, DPT, MS, PCS, C/NDT; Richard Clendaniel, PT, PhD; Remy Coeytaux, MD, PhD; Chad Cook, PT, PhD, MBA; Kyle Covington, PT, DPT, PhD, NCS; Jody Feld, PT, DPT; Carol Figuers, PT, EdD; Adam Goode, PT, DPT, PhD; Jan Gwyer, PT, PhD; Tiffany Hilton, PT, PhD; Corrie Odom, PT, DPT, MS, ATC; Amy Pastva, PT, PhD; Michael Reiman, PT, DPT, MEd, OCS, ATC, CSCS; Elizabeth Ross, PT, DPT, MMS; Andrea Taylor, PhD; and Leonard White, PhD

The Profession of Physical Therapy

Doctors of physical therapy apply knowledge of the basic sciences to the prevention and treatment of movement dysfunction resulting from disease or injury. The physical therapist screens, examines, evaluates, diagnoses, prognoses, and provides interventions across the lifespan. Patient interventions are focused on the prevention of dysfunction, the relief of pain, and the improvement of strength, endurance, flexibility, coordination, and joint range-of-motion to maximize functional potential. The variety of settings in which a physical therapist may work includes hospitals, outpatient clinics, schools, skilled nursing facilities, rehabilitation centers, sports facilities, home care agencies, and corporate businesses. With experience, additional education, and board certification, the physical therapist may choose to specialize in orthopedics, pediatrics, neurology, cardiopulmonary, sports physical therapy, clinical electrophysiology, women's health, or geriatrics. Beyond clinical practice, physical therapists may also pursue roles in education, research, and administration.

Mission Statement of the Doctor of Physical Therapy Division

The Duke Doctor of Physical Therapy (DPT) Program is committed to enhancing the health, wellness, function, and participation in the social and civic lives of all individuals. As a community of scholars engaged in discovery, dissemination, and utilization of knowledge in the best care of patients, our mission is to educate the next generation of clinical and scientific leaders through active learning experiences that promote critical thinking, so that our graduates will be engaged professionals, experts in movement science, and grounded in the discovery of knowledge for best physical therapy practice.

Doctor of Physical Therapy Program

The Duke DPT is a graduate professional degree program for entry into the profession of physical therapy. Upon successful completion of the didactic and clinical components of the curriculum, the student is awarded the DPT degree. The three-year full-time program, part of the Duke University School of Medicine, provides a comprehensive foundation in the art and science of physical therapy, and prepares graduates to serve as primary clinical care practitioners for patients with neuromusculoskeletal dysfunction, throughout the continuum of care. The Doctor of Physical Therapy Program at Duke University is accredited by the Commission on Accreditation in Physical Therapy Education (CAPTE), 1111 North Fairfax Street, Alexandria, VA 22314; telephone: (703) 706-3245; e-mail: accreditation@apta.org; website: <http://www.capteonline.org>.

Admissions

Requirements for admission to the DPT program include a baccalaureate degree, completion of prerequisite courses, three recommendation letters, Graduate Record Examination (GRE) Aptitude Test scores within the past five years, the filing of an application (including essays and reference letters), and upon invitation, a personal interview, and a \$50 application fee. The application deadline for the 2015-2016 application cycle is November 2, 2015 and the early decision deadline is August 15, 2015.

Prerequisite Coursework

Six semester credits of biological sciences (recommended courses include embryology, histology, microbiology), three semester credits of human anatomy, three semester credits of human physiology, six semester credits of

chemistry, six semester credits of physics (including principles of light, heat, electricity, mechanics, and sound), three semester credits of statistics, six semester credits of psychology (recommended courses include abnormal psychology, child, or developmental psychology), and nine semester credits of humanities/social sciences (recommended courses include scientific and technical writing, and social anthropology). Human anatomy and human physiology courses must be completed within five years of the date of the application. All prerequisite courses must be completed with a grade of C or better. No prerequisite credit can be given to courses showing a Pass/Fail grade. A baccalaureate degree in the natural sciences is not a requirement for admission; however, a background of coursework in the natural sciences is strongly recommended.

Application Procedures

Information about the Duke DPT application process can be found on the DPT website at <http://dpt.duhs.duke.edu/admissions>.

The admissions process involves submitting a completed application through the Physical Therapy Central Application System (PTCAS) and mailing all required documentation to PTCAS. Upon evaluating these materials, the Admissions Committee may offer the applicant an interview. Following the interview, the Admissions Committee may offer the applicant acceptance into the Duke DPT program.

For the early decision process the application and all supporting documents must be submitted through PTCAS (www.ptcas.org) no later than August 15 of the year preceding matriculation. Applications received after the regular admission deadline will be reviewed on a space-available basis. Only students for full-time study are accepted. State residence does not influence the admissions policies or tuition costs.

Technical Standards for Admission

All candidates for a DPT degree must possess the intellectual ability to learn, integrate, analyze, and synthesize data. Candidates must have functional use of the senses of vision, hearing, equilibrium, and smell. Their exteroceptive (touch, movement, stereognosis, and vibratory) senses must be sufficiently intact to enable them to perform all activities required for a complete physical therapist education. Candidates must have motor-function capabilities and the emotional health to meet the demands of entry-level physical therapist education and the demands of total patient care. The candidate for the DPT degree must possess the following abilities and skills:

Observation: The ability to observe is required for demonstrations and visual presentations in lectures and laboratories. A candidate must be able to observe patients accurately and completely, both at a distance and closely. This ability requires functional vision and somatic sensation and that are enhanced by a sense of smell.

Communication: A candidate should be able to speak, hear, and observe patients in order to elicit information, perceive nonverbal communications, describe changes in mood, and communicate effectively and sensitively with patients and their families, as well as instruct patients and their families. Communication should include not only speech but also reading and writing. Communication in oral and written form with the health care team must be effective and efficient.

Motor Function: A candidate should have sufficient motor function to elicit information from patients by palpation, auscultation, percussion, and movement of limbs, as well as to perform treatment maneuvers, which may include exercising, lifting, and transferring of patients, and assuring their safety during ambulation. A candidate should have motor function sufficient to execute movements reasonably required to provide general care and emergency treatment to patients. Such skills require coordination of gross and fine muscular movements, equilibrium, and sensation.

Intellectual-Conceptual, Integrative, and Quantitative Abilities: Problem solving is a critical skill demanded of physical therapists and this requires conceptual, integrative, and quantitative thinking abilities. The candidate must also be able to comprehend three-dimensional relationships and the spatial and functional relationships of structures.

Behavioral and Social Skills: A candidate must have the emotional health to fully use his/her intellectual ability, to exercise good judgment, and to complete all responsibilities attendant to the evaluation and treatment of patients.

A DPT candidate must be able to develop mature, sensitive, and effective relationships with patients, families, and colleagues. The candidate must be able to tolerate physical, and emotional stress and continue to function effectively. A candidate must possess qualities of adaptability and flexibility and be able to function in the face of

uncertainty. He or she must have a high level of compassion for others, motivation to serve, integrity, and a consciousness of social values. A candidate must possess sufficient interpersonal skills to interact positively with people from all levels of society, all ethnic backgrounds, and all belief systems.

The faculty of the Duke University DPT Division recognizes its responsibility to present candidates for the DPT degree with knowledge and skills to function in a broad variety of clinical situations and to render a wide spectrum of patient care.

The responsibility for monitoring the compliance of applicants with these technical standards is primarily placed with the DPT Admissions Committee to select entering physical therapy students who will become candidates for the DPT degree.

Criminal Background Check Policy

For Admissions

All applicants to the Doctor of Physical Therapy (DPT) Program are required to disclose any misdemeanors or felony convictions, other than minimal traffic violations including deferred adjudication. Non-disclosure/falsification may lead to revocation of an offer of acceptance into the DPT program or dismissal from the program.

A criminal background check (CBC) will be initiated at the time an applicant is accepted and matriculates to the DPT program, or at the request of the chair of the Admissions Committee regarding anyone who is wait-listed for admission. The CBC will report on federal, state, and local records that extend back a minimum of five years. Results of the CBC will be valid for one year.

A CBC is not a component of the application, interview, or the admission decision-making process for the DPT Division. However, it is a mandatory component of the post-acceptance matriculation process. There shall be an explicitly stated contingency that the final decision about matriculation into the DPT program will be made after the Admissions Committee review of the accepted applicant's CBC report. Final decisions about the matriculation of an accepted applicant who's CBC reveals information of concern will be made by the Division Executive Committee in consultation with the chair of the Admissions Committee.

Appropriate authorization will be received from each accepted applicant prior to initiating a CBC. This authorization will inform the accepted applicant that he/she may have access to CBC data about himself/herself to ensure the accuracy of the report.

No information derived from a CBC will automatically disqualify any accepted applicant from matriculation into the program. A final decision about matriculation will be made only after a careful review of factors including

- the nature, circumstances, and frequency of any offense(s);
- the length of time since the offense(s);
- documented successful rehabilitation;
- the accuracy of the information provided by the applicant in his/her application materials; and
- the accuracy of the CBC report.

Information from the CBC that is unrelated to decisions about admissions and continued enrollment will be maintained in a separate, nonadmission file and will not become part of the students' permanent file. All reports are considered confidential. Information obtained from the CBC will only be used in accordance with state and federal laws. The CBC reports will be kept in a locked file for the duration of the student's enrollment. This information will be destroyed upon a student's graduation from the DPT Division.

For Enrolled Students

Following enrollment in the Duke DPT program, students are required to disclose any misdemeanor or felony convictions other than minimal traffic violations, including deferred adjudication, within thirty days of occurrence to the division chief. Nondisclosure or falsification may be grounds for dismissal or degree revocation.

Students already enrolled in the DPT Division may, for good cause, be required at the request of the chief to undergo an additional CBC. In addition, sites conducting clinical education may require students to undergo additional background checks prior to undertaking their clinical internship. The cost for such requested background checks, if not borne by the clinical site, will be incurred by the student.

The student is aware that, when applying for the CBC, he/she automatically releases the results to the Duke DPT program and that the results will be shared with affiliating agencies that provide clinical experiences in the

program. The Division Chief will evaluate all background checks and will make the determination if the individual student can participate in clinical experiences.

Drug Screen Policy

Students enrolled in the DPT Division will be required to undergo annual drug screens from a DPT approved facility. Results from any other agency will not be recognized. A clear drug screen is also required of students by many clinical education sites.

Failure to undergo a required drug test will result in dismissal from the program. If the drug screen comes back diluted or adulterated the student will be allowed one retest. If the student fails the second test, the student will be dismissed from the program.

The student is aware that, when applying for the drug screen, he/she automatically releases the results to the Duke DPT program and that the results will be shared with the appropriate agencies that provide clinical experiences for the program.

Tuition and Expenses

The DPT program practices a “need-blind admissions process.” Full cost of attendance budgets may be found on the Office of Financial Aid website: <http://medschool.duke.edu/education/financial-aid/student-budgets>.

Financial Aid

Qualified applicants may be eligible for federal educational loan programs or institution-based loans. A small amount of need-based scholarship awards is available for selected matriculated students. Financial aid information is available for all interested applicants by contacting the Office of Financial Aid, Box 3067, Duke University Medical Center, Durham, NC, 27710; (919) 684-6649; финаid@dm.duke.edu or at the Duke University SOM Office of Financial Aid website at <http://www.medschool.duke.edu/education/financial-aid-office>.

Code of Professional Conduct

Students enrolled in the Doctor of Physical Therapy Program are expected to adhere to the Duke University School of Medicine Code of Professional conduct as detailed in the policies for all School of Medicine programs found elsewhere in this bulletin.

Standards of Academic Conduct and Examinations

The faculty of the DPT program expects and will require of all its students cooperation in maintaining high standards of scholarship and conduct in accordance with the Professional Expectations of the Duke University School of Medicine.

An honor system is employed during administration of all written and practical examinations and for specified assignments that are completed in other locations. In signing your name to your work, you are indicating that you neither gave nor received assistance during the examination. Examination administrations will not usually be proctored. All examinations administered by the department are confidential communications between the student and the instructor.

Unless expressly permitted by a course instructor, students may not utilize previous forms of written examinations to assist in their preparation. Written examinations that are returned to the student are provided for the specific purpose of enhancing that individual’s learning, and are not to be shared with any other students.

Examinations are to be taken during scheduled examination times. However, in extenuating circumstances, such as the acute illness of the student or a family member, a student may seek permission from the instructor to postpone an examination. A request to change an examination date for other reasons should be made to the chief, who will consult with the instructor involved before the student is given permission. If an instructor determines a need to change the date of a scheduled examination for an entire class, the chief should be informed of this decision by the faculty member.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided. The Student Health Fee is mandatory for all students.

Computer and Technology

Students enrolled in the physical therapy curriculum at Duke University are provided support service of any issued computing devices from the Medical Education IT Department—DPT Division (MedEDIT-DPT).

The MedEDIT provides administrative, professional, and technical expertise to the students of the School of Medicine. The School of Medicine values an open, collaborative, and congenial environment where safety is paramount. Efficient and dependable service to support state-of-the-art medical education is the goal.

All matriculating students in the School of Medicine are assessed a mandatory technology fee. This includes students enrolled in the Doctor of Physical Therapy Program. The fee will not only cover hardware such as laptop or handheld device, but service, software, and technical updates to comply with all Duke Health System compliance guidelines.

Doctor of Physical Therapy Academic Progression

Enrolled students should refer to the DPT Student Handbook for detailed program policies. Graduate students in the DPT program are participants in a professional educational program whose graduates assume positions of responsibility as primary clinical care practitioners. Accordingly, students are evaluated on their academic and clinical performance and also on their interpersonal communication abilities, their appearance, and their professional conduct. Deficiencies in any of these areas are brought to the student's attention and failure to correct these performance issues may result in probation or withdrawal from the program.

Attendance and Excused Absences

Students are expected to attend all classes and clinical internship hours, and are excused only for illness or personal emergency.

Academic Progression and Requirements for Graduation

The faculty of the DPT Division program accepts responsibility for monitoring the academic progress of each student enrolled in the program. The following policy describes the standards by which satisfactory academic progress will be assessed, the determination of academic standing, and the requirements for successful completion of the DPT degree.

Grading Standards

The grading system for the DPT program consists of two scales. All didactic and clinical courses in the curriculum, except the STEPs courses, consist of three designations: P (pass), F (fail), and I (incomplete). The grading scale for the STEPs courses consists of four designations: P (pass), LP (low pass), F (fail), and I (incomplete).

Didactic and Internship Courses

For all didactic and clinical courses in the curriculum, except the STEPs courses, the following grading system will be used:

- P (pass)
- F (fail)
- I (incomplete)

Pass/Fail Grades

The raw score range for establishing passing or failing grades will range from 0 to 100 with a score of 70 and higher established as a passing grade. A raw score of 69 or less will result in a failing grade. The raw scores earned for all courses will be recorded and maintained by the DPT program and are for internal use (for program evaluation, monitoring student progress and consideration of awards) and individual student-use only. Students must

demonstrate satisfactory performance of course content and pass the appropriate courses, in order to progress in the curriculum. For clinical education courses, the director of clinical education who serves as course director, based upon documented student performance will assign a grade.

A failing grade (F) is recorded on the permanent record of the student by the registrar, once the course director has notified the registrar that failing work has been performed by the student. Failures will not be erased from the student's permanent record and will result in the immediate withdrawal of the student from the program. A student may appeal a failing grade and withdrawal from the program (see below). Should a student successfully remediate a failing course grade, the passing grade will be placed next to the failing grade on the student's transcript. If the student fails a remediation attempt, the failing grade will be placed next to the original failing grade.

Clinical STEPs Courses

The following grading system will be used for the six Clinical STEP courses in Years 1 and 2—Physical Therapy 601 (Clinical STEP I), Physical Therapy 611 (Clinical STEP II), Physical Therapy 621 (Clinical STEP III), Physical Therapy 701 (Clinical STEP IV), Physical Therapy 711 (Clinical STEP V), and Physical Therapy 721 (Clinical STEP VI):

- P (pass)
- LP (low pass)
- F (fail)
- I (incomplete)

The six Clinical STEP courses present an integrated progression of clinical skill and professional behavior development. For integrated clinical education courses, the director of clinical education who serves as course director, based upon documented student performance will assign a grade.

A student may earn no more than one final course grade of LP in Physical Therapy 601, Physical Therapy 611, or Physical Therapy 621 in order to progress in the curriculum. A student who earns two final course grades of LP in Physical Therapy 601, Physical Therapy 611, or Physical Therapy 621 will be automatically withdrawn from the program.

A student may earn no more than one final course grade of LP in Physical Therapy 701, Physical Therapy 711, or Physical Therapy 721 in order to progress in the curriculum. A student who earns two final course grades of LP in Physical Therapy 701, Physical Therapy 711, or Physical Therapy 721 will be automatically withdrawn from the program.

Incomplete Grades

An incomplete grade is given when, at the time the grades are reported, some portion of the student's work in a course is lacking for an acceptable reason, such as illness, bereavement, or impairment. Incomplete grades may be given at the instructor's or chief's discretion, for the following reasons:

- Documented student illness that prevents the student from completing the required work in the semester in which the course is offered.
- Illness of the student's immediate family member(s), which prevents the student from completing the required work in the semester in which the course is offered.
- A student who selects alternative or additional unplanned learning experiences that will impede his or her ability to complete coursework in the semester in which the course is offered. Examples of such opportunities include: acceptance of a scholarship opportunity or participation in competitive sporting events.
- A student who requires maternity or paternity leave or time to provide elder care.

A grade of incomplete may not be given to a student for the primary purpose of providing additional time so the student may elevate a course grade. Instructors who elect to give a student an incomplete grade for an acceptable reason are committing themselves to perform the additional instruction/evaluation required for the student to complete the course within one calendar year. Incomplete grades remain on the transcript with the earned grade added later.

The course director will determine the manner in which the incomplete grade will be converted to an earned grade. The course director specifies the date by which the student must have made up the Incomplete, but in no case will this exceed more than one calendar year from the date the course ended or prior to matriculation into a clinical internship.

Incomplete grades that are not satisfied within one calendar year automatically become failing grades. If an extension to this time limit is required, an appeal in writing must be made to the division chief just prior to

expiration of the calendar year in which the incomplete grade must be completed. When the course director certifies that an Incomplete has been satisfied, a passing grade is placed alongside the Incomplete on the permanent and official transcript.

Professional Performance

Education in professional behavior is an explicit component of the professional DPT curriculum. Students must show mastery of professional behavior in all didactic and clinical education learning environments, and at all times as an enrolled student in the program. Students must also commit to complying with all regulations regarding conduct established by Duke University, the School of Medicine, and the DPT program. The faculty retains the responsibility and authority to determine a student's fitness to continue in the program.

A student who demonstrates unprofessional behavior will receive specific feedback and instruction from faculty to assist with correction of his/her behavior. Professional behavior that is not corrected by the student, following this remediation opportunity will result in the student being placed on probation. Any additional display of unprofessional behavior may result in withdrawal from the program.

Progression and Academic Standing

Normally, all first-year courses must be satisfactorily completed before a student may enroll in the second-year courses, and all second-year courses must be satisfactorily completed before a student may enroll in the third-year courses. Altered sequences for students who require remediation may be considered for approval by the chief.

Remediation is a process through which a course director provides a student an opportunity to retake a failed assessment in a course (e.g., summative assessments/examinations or practical examinations). The course director indicates in the course syllabus which course assessments must be passed in order to pass the course. Only assessments that must be passed in order to pass the course can be remediated. A student has one remediation opportunity to pass a failed assessment in a course. If a student fails a remediation attempt of a required assessment in a course, the student will earn a failing grade for the course. If a student passes the remediation attempt, the grade assigned for that assessment would be 70 percent.

Repetitive course assessment remediation is indicative of overall poor student performance in the curriculum. Student remediations of failed course assessments are tracked across all courses in the curriculum. Earned grades, remediation and professional behavior are considered in determination of the student's academic standing.

Determination of Academic Standing

All students' records are reviewed at the conclusion of each semester, and more frequently if needed, by the faculty, and each student is assigned to one of the following categories of academic standing listed below.

Good Academic Standing

The student is considered to be in good academic standing if he/she has received passing grades in all courses and required no more than two remediations. A student may be considered in good academic standing if the faculty review process has identified deficiencies in the student's academic or professional performance, but the student has not been provided with a warning.

Good Academic Standing with Warning

A student who is passing all courses but has required remediation to do so, can be given a warning. A warning may be given to a student when the faculty has concerns about the student's performance in the curriculum. By providing a warning, the student is notified of the faculty's concern regarding his or her past performance. The student also is informed that future performance must improve or the student risks withdrawal from the program.

The faculty of the DPT program will use the following standards for providing a warning to students currently in good academic standing.

- A student who successfully appeals a failing course grade.
- A student who requires three remediations.
- A student who earns a grade of LP, low pass, in any STEPs course.
- A student whose professional behavior shows an inability to correct his/her performance to meet professional standards.

The chief will notify the student that his/her performance will be monitored, and that future poor performance may result in withdrawal from the program

Withdrawal

A student who fails to demonstrate successful academic progress will be withdrawn from the program. The faculty of the DPT program will use the following standards for withdrawing a student from the program.

- A student will be automatically withdrawn following the attainment of a failing grade in any one course in the curriculum.
- A student who requires greater than five remediations or; four remediations and one LP grade in a Steps course.
- A student who earns two LP grades in the first year STEPs courses; or two LP grades in the second year STEPs courses.
- A student may be withdrawn for a serious violation of professional behavior as outlined in the School of Medicine Code of Professional Conduct.

Appeals of Academic Status (Withdrawal)

A student placed withdrawn from the program will be notified in writing by the chief. Students may appeal this decision by indicating in writing to the division chief: (a) reasons why the student did not achieve minimum academic standards, and (b) reasons why the student's academic standing should be changed. Each appeal will be considered on its merit. Individual cases will not be considered as precedent. All appeals must be mailed to the chief via US Postal Service Certified Mail and by e-mail, within three weeks of notification of academic status.

Upon receipt of the appeal the chief will review the appeal with consultation from the division vice-chiefs, the student's advisor, and the appropriate course director. The division chief will determine if the appeal of withdrawal should be granted. If the student's appeal of his/her withdrawal is approved, the chief will document the student's change in status and communicate in writing the conditions and plans for the student's reinstatement. If the student's appeal of his/her academic status is not approved, the decision of the faculty is upheld. The chief will notify the student of the decision on the appeal in writing within three weeks of receipt of the appeal. A student whose appeal is not approved may pursue an appeal of academic status to the chair of the Department of Community and Family Medicine.

Voluntary Withdrawal Policy

Students who wish to voluntarily withdraw (drop all courses) from the DPT program will be required to drop all courses and submit a written request, via certified US Mail, to the division chief. The postmark date of the withdrawal request will be the date used in determining the official date of withdrawal and in determining any refund of tuition and fees and the assignment of grades.

Once the request to withdraw is received by the chief, the chief will inform the administrative coordinator for graduate studies, who will then notify the offices of the registrar and financial aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been awarded and/or disbursed. The student should also contact these offices to ensure that they have completed all required interviews and have fulfilled any responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the effective date of their withdrawal.

Withdrawal Grades

Assignment of grades for withdrawing students is made on the basis of current grading policies detailed in the appropriate DPT Student Manual. Students withdrawing from the program prior to 70 percent of the completed session will receive a withdrawn grade for all courses in which they are enrolled. Students withdrawing after 70 percent of the completed session will receive a withdrawn passing or a withdrawn failing grade, depending on current performance for all courses in which they are enrolled.

Withdrawal Refunds

If a student withdraws, including involuntary withdrawal for academic sessions, tuition is prorated according to the following schedule:

Before classes begin:	100%
During first or second week:	80%
During third to fifth week:	60%
During the sixth week:	20%
After sixth week:	None

Student fees are nonrefundable after classes begin.

Voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. Per letter, the program director will notify the Offices of the Registrar and Financial Aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure that they have fulfilled any responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date. Questions concerning financial obligations should be referred to the bursar's office, (919) 684-3531 bursar@duke.edu.

Academic Standards for Graduation

The following standards must be met by the student to successfully complete the DPT program.

- Completion with a passing grade of a minimum of 122 course credits, including all required courses. This includes the successful completion of a research project and of all clinical education courses.
- Passing of all Practical Examinations administered by the faculty, and preparation for the Mock Licensure Exam in a manner which would give a basis for passing the exam.

Time Limits on Meeting Requirements for Graduation

The standard required length of study to complete the above-listed academic standards is eight continuous academic semesters of full-time work (including two summer terms) that is completed in thirty-three calendar months. Under extraordinary conditions, a student may be permitted a time limit of two semesters of full-time or part-time enrollment beyond the standard required length of study to complete the program. The student must apply in writing for such consideration to the chief who will review each case.

The student is expected to make continuous and successful progress toward the requirements for graduation throughout the curriculum. The student must register for all required courses during each semester of the curriculum, and may carry into succeeding semesters no more than one incomplete course grade. Under extraordinary circumstances, a student may apply for an exception to the typical pattern of progress toward degree requirements.

Incomplete Mastery of Content

If a student successfully appeals a failing grade in a course and is permitted to continue in the curriculum, the instructor is not required to provide individual remediation to the student. In this case, the only plan for remediation is for the student to retake the course in the session in which it is normally given. The student will bear all financial implications of repeated coursework. All remediation efforts must be completed within the above-outlined time limits for completion of the program, or a failing grade will remain on the student's permanent record.

Program of Study

The curriculum is composed of 122 course credits of academic work that is completed over eight academic semesters requiring thirty-three months of full-time attendance. Coursework includes didactic courses in basic sciences, clinical sciences, patient management, evidence-based practice, health policy and business, plus third-year clinical internships (thirty-six weeks). Clinical internships are conducted at approved clinical sites located in North Carolina and across the United States. International learning opportunities may be available.

Curriculum

The curriculum is presented in an integrated format, such that successful completion of all courses in each semester is required prior to progressing on to the next semester.

Year One

1st Semester Fall

PT-D 601 (Clinical STEP I)	1
PT-D 602 (Body and Brain I)	4
PT-D 603 (Applied Physiology I)	3
PT-D 604 (Movement Sciences I)	3
PT-D 605 (Professional Development I)	2
PT-D (Health Promotion across the Lifespan)	2
Total Course Credits	15

2nd Semester Spring	
PT-D 611 (Clinical STEP II)	1
PT-D 612 (Body and Brain II)	3
PT-D 613 (Applied Physiology II)	3
PT-D 614 (Movement Sciences II)	2
PT-D 615 (Professional Communication I)	2
PT-D 616 (Foundational Physical Therapist Examinations)	2
PT-D 617 (Foundational Physical Therapist Interventions)	2
Total Course Credits	15
3rd Semester Summer	
PT-D (Clinical STEP III)	2
PT-D (Evidence-Based Practice I)	2
PT-D (Cardiopulmonary Patient Management)	2
PT-D (Integumentary Patient Management)	2
PT-D (Diagnostic Imaging)	2
PT-D (Assessing Outcomes of Care)	2
PT-D (Physical Therapist Interventions I)	2
Total Course Credits	14
Year Two	
4th Semester Fall	
PT-D 701 (Clinical STEP IV)	1
PT-D 702 (Professional Communication II)	2
PT-D 703 (Evidence-Based Practice II)	2
PT-D 704 (Musculoskeletal Patient Management I)	3
PT-D 705 (Neurological Patient Management I)	4
PT-D 706 (Physical Therapist Interventions II)	3
Total Course Credits	15
5th Semester Spring	
PT-D 711 (Clinical STEP V)	1
PT-D 712 (Health Policy and Health System Design)	2
PT-D 713 (Professional Development II)	2
PT-D 714 (Musculoskeletal Patient Management II)	3
PT-D 715 (Neurological Patient Management II)	4
PT-D 716 (Physical Therapist Interventions III)	2
Total Course Credits	14
6th Semester Summer	
PT-D 721 (Clinical STEP VI)	2
PT-D 722 (Management of Health Care Delivery)	2
PT-D 723 (Health Promotion & Primary Care Practice)	2
PT-D 724 (Evidence-Based Practice Capstone)	2
PT-D 725 (Elective)	2
PT-D 726 (Elective)	2
Total Course Credits	12
Year Three	
PT-D 801 (Clinical Internship I)	12
PT-D 802 (Clinical Internship II)	12
PT-D 803 (Clinical Internship III)	12
PT-D 804 (Professional Development III)	1
Total Course Credits	37
Total Course Credits for Degree	122

Academic Calendar

Class of 2018 Academic Calendar

Year One

Session 1 (Fall 2015) – 16 weeks (14 didactic, 1 clinical, 1 vacation)

August 18-21	Orientation
August 24	Session 1 Begins
September 7	Labor Day Holiday
November 23-27	Thanksgiving Break
December 11	Session 1 Ends
	3-week Intersession Break

Session 2 (Spring 2016) – 15 weeks (13 didactic, 1 clinical, 1 vacation)

January 4	Session 2 Begins
January 18	Dr. Martin Luther King Jr. Holiday
February 22-26	Spring Break
April 15	Session 2 Ends
	1-week Intersession Break

Session 3 (Summer 2016) – 16 weeks (13 didactic, 2 clinical, 1 vacation)

April 25	Session 3 Begins
May 30	Memorial Day Holiday
June 20-24	Summer Break
July 4	Independence Day Holiday
August 12	Session 3 Ends
	1-week Intersession Break

Year Two

Session 4 (Fall 2016) – 16 weeks (14 didactic, 1 clinical, 1 vacation)

August 22	Session 4 Begins
September 5	Labor Day Holiday
November 21-25	Thanksgiving Break
December 9	Session 4 Ends
	3-week Intersession Break

Session 5 (Spring 2017) – 15 weeks (13 didactic, 1 clinical, 1 vacation)

January 4	Session 5 Begins
January 16	Dr. Martin Luther King Jr. Holiday
February 20-24	Spring Break – Week 8
April 14	Session 5 Ends
	1-week Intersession Break

Session 6 (Summer 2017) – 12 weeks (10 didactic, 2 clinical)

April 24	Session 6 Begins
May 29	Memorial Day Holiday
July 4	Independence Day Holiday
July 14	Session 6 Ends
	1-week Intersession Break

Year Three

Session 7 – (Summer 2017 & Fall 2017)- 24 weeks (12 clinical)

July 31	PT 801 Clinical Internship I Begins
	PT 804 Professional Development III Begins
October 20	PT 801 Clinical Internship I Ends
	1-week Session Break
October 30	PT 802 Clinical Internship II Begins
January 19	PT 802 Clinical Internship II Ends
	1-week Intersession Break

Session 8 – (Spring 2018) - 14 weeks (2 didactic, 12 clinical)

January 29	PT 803 Clinical Internship III Begins
April 20	PT 803 Clinical Internship III Ends
	2-week Intersession Break
May 5	PT 804 Professional Development II
May 13 (tentative)	Graduation

Please note: This calendar is subject to change.

Courses of Instruction

PT-D 601. Clinical STEP I. Clinical Student Team Experience in Practice (STEP) is the first in a series of six courses that are embedded in the six didactic semesters of the DPT curriculum. Students will work in teams with a physical therapist clinical instructor to apply skills, demonstrate clinical problem-solving, and assume professional roles in various clinical patient care settings. Each semester students will be expected to demonstrate skills and knowledge gained from the current and previous coursework. Credit: 1.

PT-D 602. Body and Brain I. This course begins a two-session exploration of the human body and brain through a variety of learning experiences, including cadaver dissection, laboratory presentations, examination and dissection of brain specimens, classroom presentation and discussion, and team-based learning activities. The overall goal of this course and the next in this sequence, PT-D 612 Body and Brain II, is to provide a framework for understanding the form and function of the human body and the organization of the neural systems in the brain and spinal cord that motivate bodily actions. The framework for PT-D 602 is primarily anatomical, with an emphasis on gross anatomy and the relationships between the musculoskeletal, neurological, and vascular systems of the human body, including a critical examination of the morphology and function of the axial skeleton, upper and lower limbs, and cardiac, pulmonary, gastrointestinal, urogenital and reproductive systems. In addition, this course examines the surface anatomy of the intact (living) human body and the palpation skills necessary to locate important bony landmarks, joint spaces, muscles, ligaments, bursae, nerves, and vessels. This course also covers the microanatomy of the major organs and the functions of their constituent cells, the embryological origins of organ systems, the biomechanics of various organ tissues, and the response of muscle, bone, joints, and soft tissue to disease and injury. In terms of regional anatomy, PT-D 602 will consider the postcranial body, while PT-D 612 will focus on the head and neck, including a comprehensive survey of the neuroanatomy and neurophysiology of the central nervous system. Credit: 4.

PT-D 603. Applied Physiology I. This course begins a two-course sequence of Applied Physiological concepts through a variety of learning experiences, including classroom presentation and discussion and laboratory experiences. The overall goal of this course and the next in this sequence, PT-D 613 Applied Physiology II, is to provide the foundational basis for understanding the body's physiological responses to physical activity. The sequence investigates how the support systems of the body (respiratory, cardiovascular, muscular, endocrine, etc.) function, in cooperation with energy production, to ensure that energy is provided for physical activity. At the completion of the two-course Applied Physiology sequence, students will understand the acute responses and chronic physiologic adaptations to physical activity, including some of the static and dynamic factors ("moderating variables") that influence such responses and adaptations. Clinical correlations and case-study applications will be used throughout the sequence. The first course in the sequence, PT-D 603 Applied Physiology I, concentrates on the following topics: a) nutrition as the basis for human performance; b) energy systems for physical activity and measuring energy expenditure; c) systems of energy delivery and utilization such as the cardiovascular, pulmonary, and skeletal muscle systems; d) body composition, energy balance, and weight control; e) vital sign and physical performance assessments; and f) physical activity and disease prevention. Credit: 3.

PT-D 604. Movement Sciences I. This course is an introduction to the elements and principles fundamental to the study of human movement. Included are basic kinesiology and biomechanics, biomechanics of biological tissues, muscle and joint structure and function, normal and pathological joint movement, and a clinically-relevant movement assessment model. Concepts of kinetics, kinematics, length-tension relationships, joint classification, and functional movement will be discussed. Clinical application of mechanical concepts will be presented. While these concepts seem very specific in nature they will always be focused on the application to the patient population. This will set the foundation for your future coursework examining how various movement-oriented interventions can potentially promote the quality of life in various patient populations along with understanding the mechanisms and

effects of various pathologies. This foundation will combine with additional intervention and pathology coursework so that students can develop treatment plans in their eventual roles in the health care community as a Clinical Doctor of Movement. Credit: 3.

PT-D 605. Professional Development I. Professional Development I is the first in a three-course series that has as its focus the development of professional behaviors, knowledge, and values in the student. In this course students will discover and develop their understanding of the obligations and rewards of professionalism. Students will learn about the profession of physical therapy, its history, accomplishments, and future directions. Students will discuss the core professional values for physical therapists and the broad dimensions of legal and ethical practice. Students will be introduced to theoretical models used to describe the processes of health and illness and the management of patients in physical therapy. Credit: 2.

PT-D 606. Health Promotion across the Lifespan. This course introduces issues related to health and wellness across the lifespan from birth to death, including physical, psychological, social, and economic aspects. Life stages from prenatal, childhood, adolescence, adulthood, and old age are covered. There is an emphasis on issues relevant to the practice of physical therapy in geriatric populations. A 4-week Introduction to Prevention unit taught by an inter-professional faculty team is embedded in the course. For this unit, learners are grouped in teams which include first year DPT, MD, and PA students. Team-based learning strategies are employed. The content includes principles of prevention for individuals, groups, and populations across the lifespan; analysis of health promotion and disease prevention service needs for populations and communities; and developing skills and attitudes needed for inter-professional team work. Credit: 2.

PT-D 611. Clinical STEP II. Clinical Student Team Experience in Practice (STEP) is the second in a series of six courses that are embedded in the six didactic semesters of the DPT curriculum. Students will work in teams with a physical therapist clinical instructor to apply skills, demonstrate clinical problem-solving, and assume professional roles in various clinical patient care settings. Each semester students will be expected to demonstrate skills and knowledge gained from the current and previous coursework. Credit: 1.

PT-D 612. Body and Brain II. This course completes the two-session exploration of the human body and brain through a variety of learning experiences, including cadaver dissection, laboratory presentations, examination and dissection of brain specimens, classroom presentation and discussion, and other team-based learning activities. The overall goal of this course is the same as the first in this sequence, PT-D 602 Body and Brain I: *to provide a framework for understanding the form and function of the human body and the organization of the neural systems in the brain and spinal cord that motivate bodily actions.* The framework for PT-D 612 is again primarily anatomical, with an emphasis on gross anatomy and the relationships between the musculoskeletal, neurological, and vascular systems of the human body. PT-D 602 surveyed these relationships in the postcranial body; PT-D 612 will focus on the morphology and function of the head and neck region, including a comprehensive survey of the neuroanatomy and neurophysiology of the central nervous system. PT-D 612 will also cover the microanatomy, embryology and pathology of the nervous system. In the end, learners will command a comprehensive fund of knowledge concerning the form and function of Body and Brain, and the means by which the nervous system governs human behavior. Credit: 3.

PT-D 613. Applied Physiology II. This course completes the two-session exploration of the human body and brain through a variety of learning experiences, including cadaver dissection, laboratory presentations, examination and dissection of brain specimens, classroom presentation and discussion, and other team-based learning activities. The overall goal of this course is the same as the first in this sequence, PT-D 602 Body and Brain I: *to provide a framework for understanding the form and function of the human body and the organization of the neural systems in the brain and spinal cord that motivate bodily actions.* The framework for PT-D 612 is again primarily anatomical, with an emphasis on gross anatomy and the relationships between the musculoskeletal, neurological, and vascular systems of the human body. PT-D 602 surveyed these relationships in the postcranial body; PT-D 612 will focus on the morphology and function of the head and neck region, including a comprehensive survey of the neuroanatomy and neurophysiology of the central nervous system. PT-D 612 will also cover the microanatomy, embryology and pathology of the nervous system. In the end, learners will command a comprehensive fund of knowledge concerning the form and function of Body and Brain, and the means by which the nervous system governs human behavior. Credit: 3.

PT-D 614. Movement Sciences II. This course is a continuation of PT-D 604 Movement Science I. Where PT-D 604 focused on how we move, this course focuses on how we control movement. The first portion of the course builds on the student's knowledge of previous movement science coursework, and focuses on observational gait analysis of normal and pathological gait patterns. The second portion of the course focuses on motor control and motor learning as areas of study for understanding the acquisition and performance of human movement. This course explores the theories and principles of motor control and motor learning as they apply to the analysis of human movement across the lifespan, as well as the application to physical therapy assessment and intervention. The third part of the course focuses on typical (normal) development. The basic understanding of human movement provides a foundation for developing assessment and intervention strategies to improve and restore movement ability. Credit: 2.

PT-D 615. Professional Communication I. This course introduces and develops the critical communication skills that are integral to the practice of physical therapy. Students will learn about patient-centered interviewing, aspects of personal communication, written and electronic documentation, principles of teaching and learning, learning styles, goal setting, behavioral change, giving and receiving feedback, self-assessment, and working effectively as a member of a group. In this course, students will be introduced to the patient/client interview from a communication perspective. Students will learn a model for conducting a patient/client interview and will practice these techniques with each other, standardized patients, and patients in clinical settings. Students will give and receive feedback in group format and individually for the purposes of developing skills in managing feedback and becoming aware of their personal strengths and areas for improvement in interviewing. Written documentation in the SOAP format will be covered and applied to actual patient cases. Learning theories and principles of learning will be applied to the role of health care provider as educator. Students will learn to prepare lessons using a variety of teaching methods for specific audiences. Credit: 2.

PT-D 616. Foundational Physical Therapist Examinations. In this course, students are taught to screen, measure, and examine problems associated with basic physiological dysfunction, movement dysfunction, and disability. Basic skills are presented in an applied, problem-solving learning environment, which is integrated with PT-D 617. The course introduces fundamental examination skills used throughout physical therapy practice and among all practice settings. Credit: 2.

PT-D 617. Foundational Physical Therapist Interventions. In this course, students are introduced to the basic physical therapist patient interventions used to ensure safe patient-interaction. Interventions include: patient safety and first aid, safe and effective patient positioning and movement, transfers, use of assistive ambulatory devices, stretching and flexibility, strength training, introduction to pharmacology and proprioceptive neuromuscular facilitation. Credit: 2.

PT-D 621. Clinical STEP III. DPT STEP is a series of six courses that are embedded in the six didactic semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to apply skills, demonstrate clinical problem-solving, and assume professional roles in various clinical patient care settings. Each semester students are expected to demonstrate skills and knowledge gained from the current and previous coursework. Credit: 2.

PT-D 622. Evidence-based Practice I. In this course students will be introduced to the science of clinical reasoning in health care and physical therapy, and, the integration of clinical reasoning and evidence based practice will be developed. Students will learn how to access knowledge for practice, and will learn the methods of scientific inquiry, including research theory, design, methods, and measurement. Students will read research literature weekly and participate in a critical appraisal of the selected research methods and the meaningfulness of the findings for clinical decisions. Credit: 2.

PT-D 623. Cardiopulmonary Patient Management. Physical therapists commonly encounter clients with cardiovascular and/or pulmonary systems dysfunction, either as a primary problem or co-morbidity. This course gives an overview of cardiovascular and pulmonary-related pathologies, examination and evaluation procedures, diagnostic procedures, goal setting, and interventional strategies. Successful completion of the course requires the ability to integrate and synthesize information from this course with prerequisite and other related courses in a variety of cardiovascular and pulmonary case-based problem-solving experiences. The lecture portion of the course provides the didactic background to make sound clinical decisions in examination, evaluation, and treatment of patients with a wide variety of cardiovascular and pulmonary diseases. The laboratory focuses on the integration of these decision-

making capabilities with the necessary psychomotor skills required for the examination and treatment of patients with cardiovascular and pulmonary diseases. Credit: 2.

PT-D 624. Integumentary Patient Management. This course introduces the practice management model for patients with pathology or impairment of their integumentary system. The histology of the skin and pathologies of the integument are the foundation from which the assessment and management of pathological processes and wounds of various etiologies are discussed. Students learn to examine patients with impairments or functional limitation and disability as a result of primary and secondary pathologies of the integument. Students learn screening techniques for secondary management of the integumentary system in many physical therapy settings and across the lifespan. Credit: 2.

PT-D 625. Diagnostic Imaging. This course introduces the student to a spectrum of diagnostic imaging techniques used for musculoskeletal, neurological, pulmonary, and cardiovascular systems. An overview of principles, techniques, purpose, process, and interpretation of diagnostic imaging will be offered, as well as indications, contraindications, advantages, and disadvantages of various specific imaging techniques. Diagnostic imaging covered will include plain film radiography, bones scans, DEXA, ultrasound, CT scans, MRI, MRA, PET scans, SPECT, and diffusion tensor imaging, as well as nuclear and interventional medicine. Emphasis will be on the role of diagnostic imaging as it relates to physical therapy, including indications for referral for imaging, and integrating imaging information with significant findings from patient history and patient examination in physical therapy assessment. Importance is placed on the skills needed to effectively collaborate and communicate with medical professionals. Credit: 2.

PT-D 626. Assessing Outcomes of Care. PT-D 626 has two specific foci. Firstly, the course introduces the metrics associated with outcomes assessment (e.g., reliability, validity, dimensionality, and interpretability), whereas the second aspect of the course introduces the learner to the most common generic, disease specific, and condition specific 1) self-report measures, 2) physical performance measures, 3) clinician report measures, and 4) administrative measures. The course will compare and contrast the merits of the measures including a discussion of the influence of bias for each measure. Credit: 2.

PT-D 627. Physical Therapist Interventions I. This course continues to build on Foundational Physical Therapist Interventions by adding to therapeutic exercise techniques including wrapping and compression garments, thermal modalities, cryotherapy, mechanical traction, soft tissue mobilization and massage techniques, aerobic exercise, airway clearance techniques, skin and wound management. Credit: 2.

PT-D 701. Clinical STEP IV. DPT STEP is a series of six courses that are embedded in the six didactic semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to apply skills, demonstrate clinical problem-solving, and assume professional roles in various clinical patient care settings. Each semester students are expected to demonstrate skills and knowledge gained from the current and previous coursework. Credit: 1.

PT-D 702. Professional Communication II. This course builds on the skills introduced in Professional Communication I by expanding the student's communication experience and preparing the student for the clinical application of advanced communication skills in the helping relationships with patients and families coping with the meaning of illness. Emphasis is placed on the psychosocial aspects of care, inter-professional communication and cultural competency which are reinforced by experiential learning, self-reflection and work with Standardized Patients. Students will continue to develop their teaching communication skills by designing formal learning experiences and developing methods for assessing learning and teaching effectiveness. Credit: 2.

PT-D 703. Evidence-based Practice II. In this course, students focus on learning how to determine the statistical conclusion validity of research evidence for practice. Students learn the logic of hypothesis testing and specific statistical tests used for descriptive and inferential analysis of experimental research data. Students read research literature weekly and discuss the analytical approaches that support the research findings. Epidemiologic statistics that enhance the understanding of diagnostic tests and treatment options are covered, as well as the analytical components of systematic reviews and meta-analyses. Students are introduced to reference management software to support their Capstone Evidence-Based Practice project work, and present examples of their summaries of research evidence to their Capstone mentors. Credit: 2.

PT-D 704. Musculoskeletal Patient Management I. This course is designed to expand the knowledge base of the student in the specialized area of Musculoskeletal Practice Management. Direct physical therapist intervention for patient examination, evaluation, diagnosis, prognosis, and intervention will be presented. Credit: 3.

PT-D 705. Neurological Patient Management I. Advanced clinical knowledge and skills are needed for physical therapy evaluation and management of complex neurological disorders. The Neurological Practice Management (NPM) Series includes the etiology, epidemiology, pathogenesis, clinical presentation of common neurological conditions and injuries, assessment procedures to define impairments and limitations in activity and participation, and development of plan of care for persons with neurological dysfunction across the lifespan. This is the first part of a two-semester course and will cover the physical therapy management for individuals with neurological and neuromuscular impairments and dysfunction, with an emphasis on the adult population. The course will cover the management of central nervous system (CNS) dysfunction, peripheral nervous system dysfunction, vestibular pathologies, and motor unit diseases. Examination, evaluation, diagnosis, pharmacological management, clinical decision-making, prognosis, standardized assessments, outcome measures and interventions will be emphasized. Diagnoses highlighted will include: cerebral vascular accident (CVA), acquired brain injury (ABI), normal pressure hydrocephalus (NPH), cerebellar dysfunction, spinal cord injury (SCI), multiple sclerosis (MS), Parkinson's Disease (PD), amyotrophic lateral sclerosis (ALS), vestibular pathologies, myasthenia gravis, and Guillain-Barre Syndrome (GBS). Management across the lifespan and in various clinical settings will be addressed, including acute care, inpatient acute rehab, outpatient, skilled nursing facilities, and home health settings. Students will participate in an Adult Movement Matters Program in which they will see adult patients with neurological and neuromuscular impairments and disabilities. Credit: 4.

PT-D 706. Physical Therapist Interventions II. In this course the student will learn physical therapist interventions associated with: pain management and neural tissue stimulation, including ultrasound, electrical stimulation; therapeutic exercise for patients with musculoskeletal and neurological diagnoses, and interventions for patients requiring the use of orthotic or prosthetic devices. For the prosthetics/orthotics unit, the emphasis will be placed on determine appropriate candidacy for a device; prescribing the device, identifying the patient's prognosis for maximal functional recovery, and need for assistive equipment, and finally on implementing the plan of care to reach the patient's goals. Credit: 3.

PT-D 711. Clinical STEP V. DPT STEP is a series of six courses that are embedded in the six didactic semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to apply skills, demonstrate clinical problem-solving, and assume professional roles in various clinical patient care settings. Each semester students are expected to demonstrate skills and knowledge gained from the current and previous coursework. Credit: 1.

PT-D 712. Health and Disability Policy and Practice. In this course, we will explore the local, regional, national and international health care and policy landscapes. Students will learn about the evolution and complexities that exist within the health care system (or non-systems) in the United States and elsewhere. Students will also have the opportunity to learn about topics ranging from the principles that underpin health economics to the policy nuances of the Americans with Disabilities Act (ADA). The ultimate goal of PT-D 712 is to first establish awareness and knowledge of policy issues related to physical therapy, and second, to be able to apply this knowledge and information to express compelling and convincing written and oral opinions on current health policy topics. Throughout the course, students will learn about many components of health care, but we will focus on rehabilitation and physical therapy services. Drawing from the published literature and from some invited guests, we will use a blend of didactic presentation and team-based learning modules. The content of this course is important in and of itself; however, it is also a precursor to PT-D 722 (Session 6) when the student will apply much of this knowledge as they explore the business aspects of physical therapy. Credit: 2.

PT-D 713. Professional Development II. Professional Development II is the second in a three-course series that has as its focus the development of professional knowledge, values and behaviors, in the student. In this course students will explore aspects of the Profession's Core Values as goals for their professional careers, and master the knowledge that provides the foundation for fully legal, ethical and professional practice as a physical therapist. This knowledge will be applied in clinical practice, in administrative and supervisory roles, and in commitment to professional social responsibility and advocacy. The Core Value for Excellence will be developed through a subunit focused on clinical reasoning. Student teams will conduct a semester-long Advocacy Project. Credit: 2.

PT-D 714. Musculoskeletal Patient Management II. This course is designed to expand the knowledge base of the student into the specialized area of Musculoskeletal Patient Management. Direct physical therapist intervention for patient examination, evaluation, diagnosis, prognosis, and intervention will be presented. Credit: 3.

PT-D 715. Neurological Patient Management II. This is the second part of a two-semester course and will continue coverage of physical therapy for individuals with neurological and neuromuscular impairments and dysfunction, with an emphasis shifting towards the pediatric population. Advanced clinical knowledge and skills are needed for physical therapy evaluation and management of children with neurological and neuromuscular disorders. This course will cover management of central nervous system (CNS) dysfunction, obstetric brachial plexus injuries, motor unit diseases, and other congenital, genetic and developmental disorders. Examination, evaluation, diagnosis, clinical decision-making, prognosis, and the use of standardized assessments, outcome measures and evidence-based interventions will be emphasized. The etiology, pathology, pathophysiology, pathokinesiology, and clinical presentation of common pediatric neurological and neuromuscular disorders will be covered as well as the typical alterations in motor development that can accompany neurological and neuromuscular disorders in children. The evolution of secondary musculoskeletal impairments and strategies for prevention will be covered as well as the continuum of care across the lifespan. Diagnoses highlighted will include cerebral palsy, acquired brain injury (traumatic brain injury, near drowning, and brain tumors), myelodysplasia, muscular dystrophy, spinal muscular atrophy, brachial plexus injury, metabolic disorders, and other developmental disorders commonly encountered in pediatric physical therapy, including congenital muscular torticollis, Down syndrome, and arthrogryposis. Management across the lifespan in various clinical settings will be addressed, including outpatient, school, early intervention, acute care, and home health settings. Management across the ICF will emphasize optimizing activity and participation by using comprehensive, proactive, preventative, evidence-based care and advocacy in addressing pathology, impairment, and limitations in function and participation.

Students will participate in *pro bono* Pediatric Movement Matters sessions in which they will see patients with neurological and neuromuscular impairments and disabilities. Availability and appropriate use of adaptive equipment, wheelchairs and other mobility devices, orthotic intervention, and assistive technologies will be presented.

Assumed knowledge: Knowledge and skills learned in Neurological Patient Management I, Neuroscience and neuro-anatomy, principles of neuroplasticity, theories of motor control and acquisition, methods for clinical evaluation, orthopedic assessments and interventions, cardiopulmonary assessments and interventions, applied therapeutic exercise for strengthening and endurance, cardiovascular training, coordination, balance, and proprioceptive neuromuscular techniques to facilitate movement, strengthen, and progress mobility from rolling, sitting, standing, and walking, and interventions to manage pain. Credit: 4.

PT-D 716. Physical Therapist Interventions III. In this course, students continue to add to their knowledge in varied Physical Therapist interventions. Special topics related to interventions for neurological and musculoskeletal issues include: functional electrical stimulation, wheelchair fitting and wheelchair skills, Pilates-based Physical Therapy, interventions for chronic pain, management of arthritis, and upper extremity prosthetics. Students will learn skills for providing patient care using the aquatic environment, and will learn about special gynecological assessments and interventions. Students will be expected to read and discuss selected literature and will begin to understand the Physical Therapist role in a patient's community reintegration. Credit: 2.

PT-D 721. Clinical STEP VI. DPT STEP is a series of six courses that are embedded in the six didactic semesters of the DPT curriculum. Students work in teams with a physical therapist clinical instructor to apply skills, demonstrate clinical problem-solving, and assume professional roles in various clinical patient care settings. Each semester students are expected to demonstrate skills and knowledge gained from the current and previous coursework. Credit: 2.

PT-D 722. Management of Health Care Delivery. This course introduces concepts that support the administration of a physical therapy practice setting. Using a developmental sequence beginning with the skills required to pursue a professional position, moving through the administrative and management knowledge needed to successfully support a practice in a variety of settings, the course progresses students to management responsibilities and skills that may be required as they move into administrative, consultative and supervisory roles as physical therapists. Credit: 2.

PT-D 723. Health Promotion and Primary Care Practice. In this course, the physical therapist's role as a primary care practitioner for neuromusculoskeletal dysfunction will be presented. Students will master content that will

allow successful screening of patients for medical referral, including application of knowledge of clinical pharmacology and nutrition and skill in physical examination of abdominal viscera. Decision-making using diagnostic clinical prediction rules will be emphasized. Case vignettes will illustrate typical patient presentations. Students will apply a decision pathway model and use a worksheet to organize their evaluations of case vignettes. The focus will be on differentiating probable systemic diseases/disorders (including medical emergencies) which require referral to other health care providers from neuromusculoskeletal dysfunction that is within the scope of physical therapist practice. Principles of health promotion, screening for health and wellness needs, and designing interventions to promote health behavior change will be covered. Credit: 2.

PT-D 724. Evidence-based Practice Capstone. In this third course in the sequence, the student will finalize his/her Evidence-based Practice Capstone project in paper and professional poster session format. The role of critical inquiry and evidence-based practice will be discussed, including the development of practice policies, and the use of evidence to support clinical decisions. Students will discuss strategies to change practice at the grass roots level and will develop a plan to foster their growth as scholarly practitioners. Credit: 2.

PT-D 725, 726. Elective I, II. In these courses, students choose two electives in which to deepen their knowledge base for practice. Practice electives are offered in: Geriatrics, Global Health, Manual Therapy, Medical Spanish, Advanced Movement Science, Neurological Gait, Pediatrics, Sports PT, Vestibular Rehabilitation, and Women's Health. Credit: 2, 2.

PT-D 730. Independent Study. Independent Study is a semester long course focused on mentored research in physical therapy practice, education, administration or policy. Students will work with an assigned mentor on an approved research project. This course is available only to approved international exchange students. Credit: 2-5.

PT-D 801, 802, 803. Clinical Internship I, II, III. This is a series of three consecutive internships occurring in the third year. Each internship period is 12 weeks in length. Students learn to manage patients across the lifespan and the continuum of care, in both inpatient and outpatient practice settings in which physical therapy is commonly practiced. Clinical sites will have the opportunity to offer 12 week, 24 week or 36 week rotations when they are able to meet curriculum requirements. Credit: 12, 12, 12.

PT-D 804. Professional Development III. In this course, students participate in sessions that replicate distance continuing education while on the third-year internships (PT-D 801, 802, 803). Students are provided with instructional content that is timely to professional development and issues. Credit: 1.

Master of Biomedical Sciences



Assistant Dean for Premedical Education: Kathryn M. Andolsek, MD, MPH
Program Director: Linda S. Lee, PhD
Associate Program Directors: Joseph A. Jackson, MD, Leonard E. White, PhD.
Senior Advisor: Maureen Cullins, MA
Administrative Coordinator: Christie T. McCray

This Duke University School of Medicine professional master's degree program aims to enhance the academic preparation of students interested in pursuing a career as a healthcare professional or a career in a related biomedical field.

The mission of the master of biomedical sciences (MBS) program is to educate and mentor individuals in an interprofessional and collaborative environment, for success in the health professions and biomedical science careers. This will be accomplished by providing the best combination of academic preparation, patient-oriented service learning, advising, and professional development. Students who complete the prescribed course of study are awarded a master of science in biomedical sciences degree by the School of Medicine.

The MBS program is administered by the Duke University School of Medicine, and is based at its campus in Durham, NC. It is offered by faculty from the basic and clinical sciences departments of the Schools of Medicine and Nursing, The Graduate School, and Trinity College of Arts & Sciences, who have extensive experience in pre-health, medical student, nursing, physician assistant, physical therapist and doctor of pharmacy teaching, and other members of the University community who have expertise in relevant areas.

Program Admission

Applicants who are a good fit for the MBS will already be good candidates for admission to medical or to another health professions school, so a baccalaureate degree from an accredited institution and most, if not all, of the typical medical/health professional school prerequisites (e.g. one year each of biology and physics; two years chemistry to include inorganic and organic; sociology; psychology; statistics) must have been completed prior to matriculation. Advanced sciences such as biochemistry and molecular biology are encouraged. To be considered for admission, applicants must have earned a minimum G.P.A. of 3.2 on all undergraduate and post-baccalaureate work. If taken within the last three years, MCAT, DAT, and GRE scores should be submitted. Students in good academic standing in other Duke University degree programs and University employees who wish to enroll in selected program courses may be considered on an individual basis, space permitting.

A complete application for admission consists of the online application including personal statement and essay question responses, submission of the \$50 application fee, and the following supporting documents: (1) a resume or curriculum vitae; (2) an official transcript from each post-secondary institution attended; and (3) two letters of evaluation written by persons qualified to testify to the applicant's capacity for graduate work. Please note that an admission decision cannot be made until all the above materials are received and the application is considered complete.

Detailed application instructions can be obtained by sending an e-mail to dukembs@duke.edu or by calling (919) 684-6351. Additional information may be found on the program's website at medschool.duke.edu/mbs.

Program Technical Standards

All candidates for the MBS degree must possess the intellectual ability to learn, integrate, analyze, and synthesize data. They must have functional use of the senses of vision, hearing, equilibrium, and smell. Their exteroceptive (touch, movement, stereognosis, and vibratory) senses must be sufficiently intact to enable them to carry out all activities required for a complete biomedical science masters education. Candidates must have motor-function capabilities, physical endurance and the emotional health to meet the program's demands, including training and service as an Emergency Medical Technician-Basic, which may include extended hours of instruction and time in clinical settings, evenings, nights, and weekends.

The study of medical sciences is not a pure intellectual exercise. Rather, a specific set of minimal physical, mental, emotional and social abilities are needed to be a successful student. Students must possess all of the abilities described in the five categories below. The use of an intermediary that would, in effect, require a student to rely on someone else's power of observation and/or communication will not be permitted. To achieve the optimal educational experience, students are required to participate in all phases of the training program.

The candidate for the MBS degree must possess the following abilities and skills necessary to successfully complete the curriculum:

- **Observation:** The ability to observe is required for demonstrations and visual presentations in lectures and laboratories. A candidate must be able to observe patients accurately and completely, both at a distance and closely. This ability requires functional vision and somatic sensation and is enhanced by a sense of smell.
- **Communication:** A candidate should be able to speak, hear, and observe patients in order to elicit information, perceive nonverbal communications, describe changes in mood, communicate effectively and sensitively with patients and their families, as well as instruct patients and their families. Communication should include not only speech but also reading and writing. Communication in oral, written, and electronic form with the health care team must be effective, efficient, and timely.
- **Motor Function:** A candidate should have sufficient motor function to elicit information from patients by palpation, auscultation, percussion, and movement of limbs, as well as carry out treatment maneuvers, which may include lifting, transferring of patients, and assisting during ambulation while assuring their own safety as well as the safety of the patient. A candidate should have motor function sufficient to execute movements reasonably required to provide general care and emergency treatment to patients. Such skills require coordination of gross and fine muscular movements, equilibrium, and sensation.
- **Intellectual-Conceptual, Integrative, and Quantitative Abilities:** Problem solving is a critical skill that requires conceptual, integrative, and quantitative thinking abilities. The candidate must also be able to comprehend three-dimensional relationships, the spatial and functional relationships of structures and to analyze and apply this information for problem solving and decision-making. They must have the ability to organize, prioritize, analyze and evaluate detailed and complex information individually, in small groups, in clinical settings and within a limited time frame.

- **Behavioral and Social Skills:** A candidate must have the emotional health to fully use his or her intellectual ability, exercise good judgment, and to complete all responsibilities attendant to the evaluation and treatment of patients. He or she must be honest, able to self-assess own mistakes, accept criticism and assume responsibility for maintaining professional behavior.

A candidate must be able to develop mature, sensitive, and effective relationships with faculty, patients, families, caregivers and colleagues. A candidate must be able to tolerate physical and emotional stress and continue to function effectively. A candidate must possess qualities of adaptability and flexibility and be able to function in the presence of uncertainty. He or she must have a high level of compassion for others, motivation to serve, integrity, and a consciousness of social values. A candidate must possess sufficient interpersonal skills to interact positively with people from all levels of society, all ethnic backgrounds, and all belief systems.

The Faculty of the Duke University School of Medicine recognizes its responsibility to present candidates for the MBS degree that have the knowledge, attitudes, and skills to function in a broad variety of academic, clinical and scientific situations. The MBS Program Admissions Committee is responsible for adhering to these technical standards during the selection of students.

Academic Calendar

2015-16

MBS Fall Term, Session I

June 25-27	Session I begins; Orientation
June 29	Monday. First class day
July 3	Friday. Independence Day Holiday; no classes*
July 6	Monday. Classes resume
August 21	Friday. Last class day in Fall Term Session I

MBS Fall Term, Session II

August 24	Monday. Session II classes begin
September 7	Monday. Labor Day Holiday; no classes*
September 8	Tuesday. Classes resume; EMT Clinical Skills Intensive*
November 24-27	Tuesday-Friday. Thanksgiving Break; no classes*
November 30	Monday. Classes resume
December 18	Friday. Last class day in Fall Term Session II
December 21, 2015- January 1, 2016	Monday-Friday. Winter Holiday Break; no classes

MBS Spring Term

January 4	Monday. Spring term classes begin
January 18	Monday. Martin Luther King, Jr. Holiday; no classes*
January 19	Tuesday. Classes resume
March 14-18	Monday-Friday. Spring recess; no classes*
March 21	Monday. Classes resume
May 6	Friday. Spring term classes end*
May 13	Friday. Commencement begins
May 15	Sunday. Graduation exercises; conferring of degrees

*Note: Students are expected to attend assigned/scheduled clinical and service learning activities even when scheduled on non-class days (e.g., holidays, breaks, weekends).

Financial Information

The MBS program practices a “need-blind admissions process.” A full cost of attendance budget may be found on the Office of Financial Aid website: <https://medschool.duke.edu/education/student-services/office-financial-aid> (refunds).

Tuition and Fees

Tuition for the 2015-2016 academic year is \$39,500 for full-time study. On notification of acceptance, prospective MBS students are required to pay a nonrefundable program deposit of \$250. Each candidate is required to submit an additional nonrefundable fee of \$75 for a criminal background check. For those who do matriculate, the program deposit is applied to the cost of tuition. Upon matriculation, additional fees (e.g. health insurance, student health, drug/alcohol screen, graduate student activity and services, recreation, technology, transcript, and parking permit) will be due. See the Office of Financial Aid website listed above for a full cost of attendance budget. Tuition and fees are subject to change without notice.

Financial Aid

Federal Financial Aid

Qualified students may be eligible for unsubsidized Federal Stafford Loans up to \$20,500, and the Grad PLUS Loan up to the cost of education.

To be considered for federal financial aid, eligible students must complete the [Free Application for Federal Student Aid \(FAFSA\)](#). The School of Medicine's federal school code for the FAFSA is 002920. More information, including specific eligibility requirements, about federal need-based financial aid can be found on the FAFSA website.

Financial aid information is available for all interested applicants by contacting the School of Medicine's Office of Financial Aid: Box 3067, Duke University School of Medicine, Durham, NC 27710, by calling (919) 684-6649, e-mailing to finaid@dm.duke.edu, or by visiting the Duke University SOM Office of Financial Aid website at <http://medschool.duke.edu/education/financial-aid-office>.

Full cost of attendance budgets may be found on the Office of Financial Aid website: <https://medschool.duke.edu/education/student-services/office-financial-aid> (refunds).

Scholarships

All applicants accepted for full-time study in the MBS program are automatically considered for limited tuition scholarships from the Program. Merit awards are determined by the Program on a competitive basis; an applicant's completed application materials serve as the scholarship application. Need-based scholarship awards are determined by the Office of Financial Aid; each student's completed FAFSA serves as the basis for these limited awards.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the MBS program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided. The Student Health Fee is mandatory for all students. Additional information regarding the services provided by Student Health may be found elsewhere in this bulletin.

Computer Technology

All matriculating students in the School of Medicine are assessed a mandatory technology fee. This includes students enrolled in the master of biomedical sciences program. The fee will not only cover issued hardware but also service, software, and technical updates to comply with all Duke Health System compliance guidelines. The Duke School of Medicine's Medical Education IT department distributes and supports a dedicated laptop to each MBS student for his/her education. Students receive the laptop, configured and secured for use in the MBS program, during Orientation.

Criminal Background Check/Drug Screening Policy

Incoming students must consent to and undergo a mandatory criminal background check (CBC) and mandatory drug screening prior to matriculation. Both the criminal background check and the drug screening are conducted by a program approved agency and the results of both are kept strictly confidential. Results from any other agency will not be recognized. A clear drug screen may also be required of students by community, research, and/or clinical sites.

An incoming student will not be permitted to begin orientation and/or classes without consenting to a criminal background check and drug screening.

Following enrollment in the Duke MBS program, students are required to disclose any misdemeanor or felony convictions other than minimal traffic violations, including deferred adjudication, within one week (seven days) days of occurrence to the Program Director. Nondisclosure or falsification may be grounds for dismissal or degree revocation.

Students already enrolled in the MBS program may, for good cause, be required at the request of the Program Director to undergo an additional CBC or drug screening test. In addition, sites providing experiential learning experiences may require students to undergo additional background checks or drug screenings prior to undertaking their experiences. The cost for such requested background checks and screening tests, if not borne by the site, will be incurred by the student.

The student is aware that, when applying for the CBC and the drug screening tests he/she automatically releases the results to the Duke MBS program. The Program Director will evaluate all background checks and will make the determination if the individual student can participate in clinical experiences.

Failure to undergo a required drug test will result in dismissal from the program. If the drug screen comes back diluted or adulterated the student will be allowed one retest. If the student fails the second test, the student may be dismissed from the program.

Immunization and Health Record

North Carolina State law and the Infection Control Committee of Duke University Hospital and Health System require all new students to provide prior to matriculation, evidence of immunity to certain vaccine-preventable illnesses. Upon acceptance, students receive the Student Health Immunization Form and Report of Medical History which should be completed and returned prior to the first day of Fall Term Session I to the Student Health Center, Box 2899, DUMC, Durham, NC 27710.

Duke University and the School of Medicine hold the health and welfare of their students, patients, and faculty in the highest regard. Students' failure to comply with North Carolina state immunization requirements and those of the School of Medicine may result in the student not being allowed to begin their coursework until all immunization requirements are met. For questions or concerns about immunization requirements, please contact the Student Health Department at immunizations@duke.edu or by phone at (919) 681-WELL.

Students are encouraged to review and update their records as soon as possible. Failure to meet requirements may result in course scheduling delays. Since most courses are only offered once per academic year, such delays may result in a delay of graduation by an entire year. Please refer to <https://studentaffairs.duke.edu/studenthealth/immunization-compliance> for the most current detailed immunization information.

Academic Regulations

Registration

Registration in the master of biomedical sciences program is processed in accordance with instructions distributed by the Office of the Registrar of the School of Medicine prior to official registration periods. As this program is designed for full-time study, dropping and adding courses is at the discretion of the Program Director upon consultation with the student's adviser. Please note that courses taken outside the program must be approved by the student's advisor (and, in some cases, by the Program Director) prior to enrollment.

Attendance Policy

Students are expected to be punctual and to attend all MBS program educational activities, including but not limited to lectures, laboratories, seminars, as well as clinical, research and service learning assignments. Much of the programmed course time involves discussion and team-based learning activities; individual attendance and participation affects group performance and development of individual competence. Service learning assignments require accountability to the individuals, communities and organizations served. Students are expected to attend regular clinical and service learning activities even when scheduled on non-class days (e.g., holidays, breaks, weekends). Enrolled students should refer to the Duke MBS Program Student Handbook for detailed program policies.

Dress Code

Students should be aware of the dress codes of the various curricular components. Student activities involving patient care require appropriate professional dress.

Leaves of Absence

Leaves of absence with anticipated readmission may be granted to students in good standing who demonstrate a compelling nonacademic reason for a leave. He or she may be granted a leave of up to one academic year. If a leave expires without the student re-entering the program, the student will be withdrawn from the program. Enrolled students should refer to the Duke MBS Program Student Handbook for detailed information regarding leave requests, program re-entry, requirements for repeating and/or completing degree requirements, and eligibility to earn the degree.

Time Limitations

A degree candidate is expected to complete all requirements within one calendar year of matriculation. Degree credit for a course expires three years after the course is completed by the student; in this case, degree credit can be obtained only by retaking the course.

Activities Outside of the MBS

Due to the rigors of the curriculum, most students will find it difficult or impossible to work. Part time employment over breaks and holidays is at the discretion of the student; however students may not perform any medical tasks or procedures under the auspices of their role as Duke MBS students beyond those required for completion of their academic program. The following policies apply to students who wish to be employed during their training:

- Any student working while attending the program must notify his/her advisor.
- Working students must comply with the program's academic schedule and are prohibited from working more than twenty hours per week.
- Part-time employment must never interfere with class or clinical assignments.
- Any student who is unable to maintain satisfactory academic standing as outlined in this bulletin will be required to terminate his/her employment.

Transfer of Credit

Course work taken outside of Duke University is not transferable to the Master of Biomedical Sciences Program.

Grading

Grades in the Master of Biomedical Sciences program consist of H (Honors), HP (High Pass), P (Pass), F (Fail) or P (Pass)/F (Fail).

Successful completion of required course components will result in a grade of "P." In some courses, students will be able to demonstrate work beyond the expected passing standard which may result in a grade of HP, or if truly exemplary, an "H". "HP" and "H" are not awarded routinely to a predetermined percentage of the student cohort.

For actively enrolled students, an I (incomplete) indicates that some portion of the student's work is lacking for a reason acceptable to the instructor at the time grades are reported. Students will not be permitted to enroll in any course for which they have an unresolved I in a prerequisite course. A grade of I must be resolved by the date specified by the course director to make up the deficiency, and no later than the end of the following academic semester. For students on an approved leave, an Incomplete that is not resolved within the designated period may be extended for a specified period with the written approval of the course director and the Program Director. If an Incomplete is not resolved within the approved period, the grade of I becomes permanent and will not be removed from the student's record.

In most cases, a student's enrollment as a degree candidate is terminated if she or he receives a single grade of F. For these purposes, both a WF (see below) and a permanent I are considered failing grades.

Academic Progression

Enrolled students should refer to the Duke MBS Program Student Handbook for detailed program policies. Graduate students in the MBS program are participants in a health professions educational program. Accordingly, students are evaluated on their academic and clinical performance and also on their interpersonal communication abilities, their appearance, and their professional conduct. Deficiencies in any of these areas are brought to the student's attention and failure to correct these performance issues may result in probation or dismissal from the program.

Withdrawal from a Course

In the event that a student withdraws from a course, the grade of the student at the time of withdrawal from the course is indicated on the permanent record as WP (Withdrew Passing) or WF (Withdrew Failing).

Withdrawal from the Program

If a student withdraws, including involuntary withdrawal for academic reasons, tuition is pro-rated according to the following schedule:

- Before classes begin: 100%
- During first or second week: 80%
- During third to fifth week: 60%
- During the sixth week: 20%
- After sixth week: None

Student fees are nonrefundable after classes begin.

The status of the student at the time of withdrawal from the program is indicated on the permanent record as WP (Withdrew Passing) or WF (Withdrew Failing).

Voluntary withdrawal from the program is initiated at the request of the student. Such requests must be submitted in writing to the Program Director. The Program Director will notify the Office of the Registrar and course faculty as appropriate given the student's enrollment status at the time of withdrawal. It is the student's responsibility to contact the bursar's office regarding fulfillment of financial obligations to the university.

Code of Professional Conduct

Students enrolled in the master of biomedical sciences program are expected to adhere to the Duke University School of Medicine Code of Professional conduct as detailed in the policies for all School of Medicine programs found elsewhere in this bulletin. Additional information regarding specific program policies and procedures may be found in the Duke MBS Program Student Handbook.

Standards of Academic Conduct and Academic Assessments

The faculty of the MBS program expects and will require of all its students cooperation in maintaining high standards of scholarship and conduct in accordance with the professional expectations of the Duke University School of Medicine as described elsewhere in this bulletin.

An honor system is employed during administration of all written and practical examinations and for specified assignments that are completed in other locations. In signing his/her name to work, students are indicating that they neither gave nor received assistance during the examination. All examinations administered by the department are confidential communications between the student and the instructor.

Unless expressly permitted by a course instructor, students may not utilize previous forms of written examinations to assist in their preparation. Written examinations that are returned to the student are provided for the specific purpose of enhancing that individual's learning, and are not to be shared with any other students.

Examinations are to be taken during scheduled examination times. However, in extenuating circumstances, such as the acute illness of the student or a family member, a student may seek permission from the instructor to postpone an examination. A request to change an examination date for other reasons should be made to the Program Director, who will consult with the instructor involved before the student is given permission. If an instructor determines a need to change the date of a scheduled examination for an entire class, the Program Director should be informed of this decision by the faculty member.

Satisfactory Academic Progress

The faculty of the master of biomedical sciences degree program accepts responsibility for monitoring the academic progress of each student enrolled in the program. Students are required to meet with their academic advisors at least once each semester and encouraged to meet more frequently.

The Promotion committee will meet monthly to review students' performance in all coursework and provide feedback to the advisors. When performance issues are identified, the student will be contacted regarding development and implementation of an appropriate remediation plan.

Satisfactory academic progress for full-time students in the MBS program consists of the successful completion of all requirements necessary to advance toward completion of degree requirements one year from the time of matriculation.

Graduation

To graduate, students must complete with a passing grade the 38 credits required for the master of science in biomedical sciences degree to include all required courses, clinical and other experiential learning requirements. Candidates for the master of science in biomedical sciences degree must apply to graduate through ACES in keeping with the instructions and deadlines announced by the Office of the Registrar in the School of Medicine. Failure to do so may delay conferral of the degree and issuance of the diploma, even if all degree requirements have been met.

Program of Study

The degree requires a total of 38 credits; of these, eleven courses comprise a required core curriculum of 33 credits. The remaining five credits are earned by completing one of two options for an individualized concentration: five credits of approved elective coursework or a mentored research/focused study or practicum project resulting in a written capstone paper for which five credits are awarded. Students must complete 38 credits as follows:

11 required courses: (33 credits)

HLTHSCI 501	Human Structure (5)
HLTHSCI 511	Enhanced EMT Training Course (2)
HLTHSCI 511, 512	EMT Clinicals I, II (1 each; 2 total)
HLTHSCI 502	Cellular Sciences (5)
HLTHSCI 503	Systems Sciences (5)
HLTHSCI 504, 505, 506	Medical Arts and Sciences Proseminar I, II, III (2 each for 3 semesters; 6 total)
HLTHSCI 509	Medical Statistics (1)
HLTHSCI 507, 508	Discovery/Special Topics Journal Club I, II (2 each for two semesters; 4 total)
HLTHSCI 510	Health and Health Systems (3)

Elective concentration: (5 credits)

- **Option 1:** Research/focused study with capstone paper (5)
- **Option 2:** Selected coursework. With permission of instructor/department and adviser approval (5)

The elective options will enable students to complete "concentrations" through elective coursework or a focused research project and paper. The program of study for the elective option will be determined contingent upon each student's intake assessment and identified needs and interests.

Courses of Instruction

HLTHSCI 501 Human Structure. The fundamental goal of this course is to provide an anatomical framework for understanding the form and function of the normal human body. In pursuing that goal, this course will expose students to principles that define critical thinking within the basic sciences. The knowledge students develop about anatomical relationships and structure and function can then be applied to problems of dysfunction that are relevant to clinical practice providing the foundation for success in other courses and in future studies. This goal will be achieved through a variety of team-centered and learner-focused experiences, including direct, active dissection of human cadavers, learner-centered investigation of intact and prosected human brain specimens, classroom presentation and discussion, and team-based learning activities. The team-based learning activities will emphasize applications that connect the dissection and didactic experience to larger problems in functional and clinical anatomy. With

these goals in mind, the central theme of the course is gross human anatomy and the relationships between the musculoskeletal, neurological, and vascular systems of the human body. These relationships will be explored by dissection, examination, and integrative investigations of the morphology and function of the axial skeleton, upper and lower limbs, the central and peripheral nervous systems, and cardiac, pulmonary, gastrointestinal, urogenital and reproductive systems. This process will involve the instructional staff for gross anatomy in all aspects of the course, as well as course leaders from other courses in the Masters of Biomedical Sciences curriculum. The broader participation of program faculty will help integrate course content with larger curricular goals and objectives, including those pertaining to the medical arts and sciences—a unique feature of this approach that is typically absent from a traditional undergraduate course on human anatomy. Thus, this course will include a focus on the surface anatomy of the intact (living) human body and the palpation skills necessary to locate important bony landmarks, joint spaces, muscles, ligaments, bursae, nerves, and vessels as well as the anatomical correlates of many clinical procedures including venipuncture, tracheotomy, and fractures or joint displacement reduction. These areas highlight key aspects of human functional anatomy as they pertain to clinical practice and are critical for training and practice as emergency medical technicians (EMT). Therefore, content sequence and clinical correlations with the concurrent EMT-B course will be emphasized. Mode of instruction for this course will utilize the principles and practices of team-based learning, with students organized in small teams for readiness assurances, integrative team applications and guided discovery in laboratory experiences. Prerequisite: none. Credit 5. (Degree requirement)

HLTHSCI 502 Cellular Sciences. The goal of this course is to build a basic understanding of the molecular and cellular principles of tissue organization, organ function, and human disease. The course will include a survey of several perspectives on cellular sciences, including biochemistry, cell biology, cellular physiology, genetics, immunology, pharmacology, microanatomy, and the basic mechanisms of pathology. The integration of this content will emphasize the structure and function of the cells and tissues of the body, the relationships among the major classes of macromolecules in cellular systems, metabolic control mechanisms, and the biochemical basis of human diseases. A laboratory component provides an interactive experience using virtual microscopy to analyze the structure of normal and pathological cells and tissues. Mode of instruction for this course will utilize the principles and practices of team-based learning, with students organized in small teams for readiness assurances, integrative team applications and clinical correlations. Prerequisite: none. Credit 5. (Degree requirement)

HLTHSCI 503 Systems Sciences. The goal of this course is to develop a conceptual model for understanding the physiology of major organ systems in the body, building upon the integration of human structure and cellular sciences. The focus of this course will be on the integrated function of organ systems in regulating the overall homeostasis of the human body, as well as the pathophysiological response of organ systems to injury and disease. The course will feature laboratory exercises, clinical correlations, and active learning experiences that incorporate exploration and dissection of fresh (non-preserved) human structures and non-human tissues. Mode of instruction will implement the principles and practices of team-based learning, with students organized in small teams for readiness assurances and integrative team applications. Prerequisite: HLTHSCI 502. Credit 5. (Degree requirement)

HLTHSCI 504, 505, 506 Medical Arts and Sciences I, II and III. This 3-semester longitudinal course is designed to enhance understanding of the meaning of illness, and the development of personal identity and professional formation in the aspiring health professional. Through training and practice as EMTs and regular small group seminars with mentoring faculty and advisers, the course stresses active learning in a supportive environment. Students will develop a core set of skills including improved insight and self-awareness, effective verbal and written communication, cultural humility, self-reflection and practice giving and receiving feedback. They will demonstrate self-care and resiliency, practice conflict management and critical conversations, explore career alternatives, practice teamwork, strategically plan their application processes and timelines, and practice interviewing. Prerequisite: none; must be taken in sequence Credit 2 each. (Degree requirement)

HLTHSCI 507, 508 Discovery/Current Topics/Journal Club I and II. The course will consist of introductory skills in searching, critically reading and interpreting the medical literature. Students will learn how to construct appropriate clinical questions to discover answers to challenging patient situations. The course will feature outside speakers who will provide expertise on current topics in medicine and health care delivery followed by interactive large and small group exercises. Prerequisite: none. Credit 2 each. (Degree requirement)

HLTHSCI 509: Medical Statistics. This course covers statistical concepts that enable understanding of the medical literature including study design; summarizing and presenting data; relationships between two variables; probability

and probability distributions; analysis of means, variance, covariance and proportions; correlation; regression; and power and sample size. Prerequisite: none. Credit: 1. (Degree requirement)

HLTHSCI 510: Health Systems and Health. The US healthcare system is in the midst of a tumultuous transformation. The goals of this course are to understand the key principles on which the US healthcare system was established, how it functions today, and how to help it work successfully in the future. Students will review historical milestones and readings and discern with fellow students and faculty the underlying principles on which the US healthcare system is based; describe current principles and mechanisms of healthcare finance, healthcare delivery, and healthcare policy, and discuss how they impact health systems performance and health outcomes; and learn and utilize key quality improvement skills and methodologies, systems-based healthcare approaches, team function, behavior change theories and methodologies, project management, and interpersonal skills needed to improve population health outcomes, the experience of healthcare, and to reduce overall health/healthcare costs. Students will work in teams and submit a project proposal to improve the health of a specified population. Prerequisite: none. Credit 3. (Degree requirement)

HLTHSCI 511 Enhanced EMT-Basic Training Course. This course is designed to instruct a student to the level of Emergency Medical Technician-Basic (EMT-B), and will be concurrent with and supplemented by correlated content in the Human Structure and Cellular Sciences courses. The EMT-B serves as a vital link in the chain of the healthcare team. It is recognized that the majority of pre-hospital emergency medical care will be provided by the EMT-Basic. This includes all skills necessary for the individual to provide emergency medical care at a basic life support level with an ambulance service or other specialized service. Specifically, after successful completion of the course, the student will be capable of performing the following functions at the minimum entry level: recognize the nature and seriousness of the patient's condition or extent of injuries to assess requirements for emergency medical care; administer appropriate emergency medical care based on assessment findings of the patient's condition; lift, move, position and otherwise handle the patient to minimize discomfort and prevent further injury; and, perform safely and effectively the expectations of the job description. Mode of instruction will implement the principles and practices of team-based learning, with students organized in small teams for readiness assurances and integrative team applications. Prerequisite: none. Students who have completed a prior EMT Basic Training Course will be expected to participate in this course, and demonstrate maintenance of competency by passing the examinations and participating in the four day skills practicum. If they have active certification acceptable to the state of North Carolina they will not have to sit for "recertification." Credit 2. (Degree requirement)

HLTHSCI 512 EMT Clinicals I. This course builds on HLTHSCI 511 and consists of required clinical experiences through which students will demonstrate their mastery of the skills necessary to function as part of the health care team in providing emergency medical care at a basic life support level with an ambulance service or other specialized service. The course will be concurrent with and supplemented by correlated content in the Cellular Sciences, Systems Sciences, Medical Arts & Sciences Proseminar, and Discovery/Journal Club courses. Prerequisite: HLTHSCI 511. Credit 1. (Degree requirement)

HLTHSCI 513 EMT Clinicals II. This course continues the required clinical experiences through which students will demonstrate their mastery of the skills necessary to function as part of the health care team in providing emergency medical care at a basic life support level with an ambulance service or other specialized service. The course will be concurrent with and supplemented by correlated content in the Systems Sciences, Medical Arts & Sciences Proseminar, and Discovery/Journal Club courses. Prerequisite: HLTHSCI 512. Credit 1. (Degree requirement)

Master of Biostatistics Program



Department of Biostatistics and Bioinformatics

Department Chair: Elizabeth R. DeLong, PhD

Codirectors of Graduate Studies: Megan L. Neely, PhD and Gregory P. Samsa, PhD

Program Coordinator: Rob Hirtz

As biomedical research becomes increasingly quantitative and complex, a need exists for individuals who possess exceptional analytic skills, a strong foundation in human biology, and the ability to effectively communicate

statistical principles to multi-disciplinary research teams. Demand is particularly high for individuals formally trained in biostatistics.

Duke University Medical Center is a world-class medical research institution that provides an ideal setting for training biostatisticians to gain exposure to state-of-the-art biostatistical methodology in the context of cutting-edge science research. Duke's Master of Biostatistics Program is unique in its balanced focus on three core competencies: analysis, biology, and communication. All faculty members in the Department of Biostatistics and Bioinformatics at Duke are actively engaged in research, with projects collectively spanning a broad array of biomedical research areas. Faculty members actively practice what they teach and are dedicated to ensuring that students develop the skills and knowledge necessary to succeed as biostatisticians.

Program of Study

The master of biostatistics degree requires 36 course credits of graded coursework, a practicum experience, a qualifying examination, and a master's project for which 6 course credits are given. Eleven courses (BIOSTAT 701, 702, 703, 704, 705, 706, 707, 721, 722, 801, 802) constitute 26 course credits that are required for all degree candidates. Completed in the second year, the master's project (BIOSTAT 720) serves to demonstrate the student's mastery of biostatistics.

Program Admission

All persons wishing to take courses in the Master of Biostatistics Program, even on a non-degree basis, must be admitted to the program. The information outlined here in the School of Medicine Bulletin is a brief summary of the information available on the program website: <http://biostat.duke.edu/master-biostatistics-program/program-overview>. This website should be consulted for the most up-to-date and comprehensive information about our application process and requirements. If you should have any questions, you may contact Rob Hirtz at rob.hirtz@duke.edu.

The minimum requirements for admission to the Master of Biostatistics Program include

- a bachelor's degree (or the equivalent to a US bachelor's degree) from an accredited institution and
- mathematics coursework through multivariable calculus and a strong interest in biological science. Linear algebra is strongly recommended.

Incoming students must be well-prepared in terms of general mathematical and scientific background. Strength in mathematics is assumed. Prior coursework or other relevant experience in the biological sciences will be advantageous and viewed favorably in admissions decisions.

All parts of the online application must be filled out completely and submitted to the Master of Biostatistics Program with the application fee by the application deadline. The necessary supporting documents must also be included as part of the submission of the online application. The application fee is \$80. The required supporting documents are: (1) one copy of a transcript from each undergraduate and graduate institution attended; (2) three letters of recommendation; (3) official Graduate Record Examination (GRE) General Test scores; (4) official Test of English as a Foreign Language (TOEFL) scores (for all applicants whose first language is not English). Please note that an admission decision cannot be made until all the above materials are received and your application is considered complete.

If an applicant accepts an offer of admission, she or he must send an official, confidential transcript to the Program for each institution listed in the online application. The Master of Biostatistics Program reserves the right to revoke any offer of admission in the case of a discrepancy between the transcript included in the online application and the official transcript.

Materials submitted in support of an application are not released for other purposes and cannot be returned to the applicant.

Those applying for fall admissions should take the General Record Examination (GRE) in time for official scores to reach the Master of Biostatistics Program by the application deadline. Information on the dates and locations of the GRE can be obtained from the applicant's educational institution or the Educational Testing Service GRE website: <http://www.ets.org/gre>.

TOEFL/IELTS Policy for International Applicants. If an applicant's first language is not English, the applicant must submit certification of English proficiency demonstrated by official test scores from the Test of English as a Foreign Language (TOEFL) (<http://www.ets.org/toefl>) or the International English Language Testing Service (IELTS)

(<https://www.ielts.org>). International students who will have completed two full years of academic study at a US institution by the time they would matriculate into the Master of Biostatistics Program are not required to take the TOEFL test.

English Language Requirements for International Students. In addition to submitting a TOEFL or IELTS score, international students whose first language is not English must demonstrate proficiency in academic English by taking oral and written exams upon their arrival at Duke. Depending on their exam results, students are either exempted from or placed into one or more English for International Students (EIS) courses. Students with EIS requirements must begin these courses in their first year of study.

Nondegree Study. Nondegree study is granted at the discretion of the codirectors of graduate studies, requires the permission of the appropriate course instructor(s), and is subject to constraints imposed by course prerequisites and class size limitations.

Academic Calendar

Fall 2015

August 18 Monday. English for International Student (EIS) testing

August 18 Monday. Program orientation begins

August 19 Wednesday, 4:00 PM. Convocation for graduate and professional school students

August 24 Monday, 8:30 a.m. Fall semester classes begin; Drop/Add continues

September 4 Friday. Drop/Add ends session

September 7 Monday. Labor Day. Classes in session

October 9 Friday, 7 p.m. Fall break begins

October 14 Wednesday, 8:30 a.m. Classes resume

November 4 Wednesday. Registration begins for Spring 2016

November 18 Wednesday. Registration ends for Spring 2016

November 19 Thursday. Drop/Add begins for Spring 2016

November 24 Tuesday. Classes end

November 30-December 7 Monday-Monday. Reading period

December 8 Tuesday, 9 a.m. Final examinations begin

December 13 Sunday, 10 p.m. Final examinations end

Spring 2016

January 13 Wednesday, 8:30 a.m. Spring semester begins (Monday class meeting schedule); Drop/Add continues

January 14 Thursday. Regular class meeting schedule begins

January 18 Monday. Martin Luther King, Jr. Day holiday. No classes

January 27 Wednesday. Drop/Add ends

March 11 Friday, 7 p.m. Spring recess begins

March 21 Monday, 8 a.m. Classes resume

April 6 Wednesday. Registration begins for Fall 2016

April 15 Friday. Registration ends for Fall 2016

April 16 Saturday. Drop/Add begins for Fall 2016

April 20 Wednesday. Classes end

April 21-May 1 Thursday-Sunday. Reading period

May 2 Monday. Final examinations begin

May 7 Saturday, 10 p.m. Final examinations end

May 13 Friday. Commencement begins

May 15 Sunday. Graduation exercises; conferring of degrees

Curriculum Overview

The Master of Biostatistics Program curriculum is structured as follows:

Core Courses

Foundational courses required of all degree-seeking students.

- BIOSTAT 701 (Introduction to Statistical Theory and Methods I) (3 course credits)
- BIOSTAT 702 (Applied Biostatistics Methods I) (3 course credits)
- BIOSTAT 703 (Introduction to the Practice of Biostatistics I) (3 course credits)
- BIOSTAT 704 (Introduction to Statistical Theory and Methods II) (3 course credits)
- BIOSTAT 705 (Applied Biostatistical Methods II) (3 course credits)
- BIOSTAT 706 (Introduction to the Practice of Biostatistics II) (3 course credits)
- BIOSTAT 707 (Statistical Methods for Learning and Discovery) (3 course credits)
- BIOSTAT 721 (Introduction to Statistical Programming I) (2 course credits)
- BIOSTAT 722 (Introduction to Statistical Programming II) (2 course credits)
- BIOSTAT 801 (Biostatistics Career Preparation and Development I) (0.5 credit)
- BIOSTAT 802 (Biostatistics Career Preparation and Development II) (0.5 credit)

Practicum

All candidates for the masters of biostatistics degree are required to complete a practicum. The practicum is an experiential learning opportunity. The main goal of the practicum is to allow students to develop their analytic ability, biological knowledge, and communication skills. The practicum is typically completed during the summer after the first year, but can be completed during the second year.

Qualifying Examination

All candidates for the Master of Biostatistics degree are required to pass a written Qualifying Examination demonstrating their mastery of fundamental concepts acquired through completion of the first-year core courses (BIOSTAT 701-706 inclusive). Students are expected to take the Qualifying Examination after completing the first year of study in the program and prior to beginning their elective coursework.

Master's Project

All candidates for the master of biostatistics degree are required to complete a Master's Project. Completed in the second year, the Master's Project serves to demonstrate the student's mastery of core statistical concepts and the practice of biostatistics.

- BIOSTAT 720 (Master's Project) (6 course credits)

Elective Courses

Full-time master of biostatistics students will select five elective courses during the second year of study.

- BIOSTAT 708 (Clinical Trial Design and Analysis) (2 course credits)
- BIOSTAT 709 (Observational Studies) (2 course credits)
- BIOSTAT 710 (Statistical Genetics and Genetic Epidemiology) (2 course credits)
- BIOSTAT 713 (Survival Analysis) (2 course credits)
- BIOSTAT 714 (Categorical Data Analysis) (2 course credits)
- BIOSTAT 718 (Analysis of Correlated and Longitudinal Data) (2 course credits)
- BIOSTAT 719 (Generalized Linear Models) (2 course credits)

Professional Development Courses

- BIOSTAT 801 (Biostatistics Career Preparation and Development I)
- BIOSTAT 802 (Biostatistics Career Preparation and Development II)

Course Planning

During the first year of study, full-time master of biostatistics students will typically take eight core courses:

Fall Semester:

- BIOSTAT 701 (Introduction to Statistical Theory and Methods I) (3 course credits)
- BIOSTAT 702 (Applied Biostatistical Methods I) (3 course credits)
- BIOSTAT 703 (Introduction to the Practice of Biostatistics I) (3 course credits)
- BIOSTAT 721 (Introduction to Statistical Programming I) (2 course credits)

Spring Semester:

BIOSTAT 704 (Introduction to Statistical Theory and Methods II) (3 course credits)

BIOSTAT 705 (Applied Biostatistical Methods II) (3 course credits)

BIOSTAT 706 (Introduction to the Practice of Biostatistics II) (3 course credits)

BIOSTAT 722 (Introduction to Statistical Programming II) (2 course credits)

BIOSTAT 802 (Biostatistics Career Preparation and Development II) (0.5 course credit)

During the second year of study, full-time master of biostatistics students will take one core course, a set of elective courses, and receive credit toward the completion of the master's project. A typical sequence is as follows:

Fall Semester:

BIOSTAT 707 (Statistical Methods for Learning and Discovery) (3 course credits)

BIOSTAT 720 (Master's Project) (3 course credits)

Elective Courses (4 course credits)

Spring Semester:

BIOSTAT 720 (Master's Project) (3 course credits)

Elective Courses (6 course credits)

Academic Regulations

Attendance Policy

Students are required to attend and participate in class sessions according to the expectations set forth by individual course instructors. In the absence of a specific course attendance policy, students should assume that attendance is expected and that absences require consultation with the instructors regarding arrangements for missed work.

Registration and Drop/Add Policy

Registration in the Master of Biostatistics Program is processed in accordance with instructions distributed by the Office of the Registrar in the School of Medicine prior to official registration periods.

As the Master of Biostatistics Program is designed for full-time study, dropping and adding courses is at the discretion of the codirectors of graduate studies. Please note that courses taken outside the department must be approved by the codirectors of graduate studies prior to enrollment.

Audits

Any student who wishes to audit a course in the Master of Biostatistics Program must receive permission of the instructor as well as the codirectors of graduate studies. The standard \$400 audit fee applies to each course audited.

Grades

All courses, except those noted below, will be graded on a 5 letter grade scale (A,B,C,D,F) with +/- grades assigned at the course instructor's discretion. The only exceptions are BIOSTAT 721, 801, and 802 which are graded on a Pass/Fail scale.

An I (incomplete) indicates that some portion of the student's work is lacking for a reason acceptable to the instructor at the time grades are reported. Students will not be permitted to enroll in any course for which they have an unresolved I in a prerequisite course. A grade of I must be resolved no later than the end of the following academic semester, unless the course director specifies an earlier date by which the student must make up the deficiency. In exceptional circumstances, an Incomplete that is not resolved within the designated period may be extended for a specified period with the written approval of the course instructor and the codirectors of graduate studies. If an Incomplete is not resolved within the approved period, the grade of I becomes permanent and may not be removed from the student's record.

A student's enrollment as a degree candidate can be terminated if she or he receives a single grade of F or two grades of D in the program. For these purposes, a permanent I is considered a failing grade. The decision to terminate the student's enrollment is the responsibility of the codirectors of graduate studies.

In the case of a student withdrawing from a course after the drop/add period, the student will receive a grade of W, WP (withdraw passing), or WF (withdraw failing), as determined by the codirectors of graduate studies and the course instructor.

Satisfactory Academic Progress

Satisfactory academic progress for full-time students in the Master of Biostatistics Program consists of the successful completion of all requirements necessary to advance toward completion of degree requirements within the six-year time limitation. This includes successful completion of the qualifying examination (see above) as well as meeting the requirements and standards for completion of the master's project as described in program guidelines.

For nondegree students, satisfactory academic progress consists of successful completion toward attainment of individual training goals, within the constraints imposed by course prerequisites.

Academic Probation Policy

A student who receives 2 C's or 1 grade of D or lower in any two of the required courses may be placed on academic probation at the discretion of the codirectors of graduate studies. If a student receives at least a B- grade for all courses during the probationary semester, s/he will be removed from academic probation. The School of Medicine registrar will be notified of the student's academic status and it may be noted on the student's transcript at the completion of the semester(s) during which the status is assigned. Once the student has been removed from probationary status, the notation on the student's transcript will be removed.

Leave of Absence Policy

A master of biostatistics student, after presenting a written request to the codirectors of graduate studies, may be granted an official leave of absence for personal, medical, or academic reasons for a period not to exceed one calendar year. If the leave of absence is approved, the codirectors of graduate studies provides written notification including applicable beginning and ending dates to the student and the Office of the Registrar and the Office of Financial Aid in the School of Medicine. The student must notify a codirector of graduate studies in writing of his or her wish to return to the Master of Biostatistics Program or to extend the personal leave at least sixty calendar days prior to the anticipated date of re-entry. The student desiring an extension beyond one calendar year may be required to apply for readmission to the program. When a leave of absence is taken, the director of graduate studies may require the student to repeat some or all of the courses completed prior to the leave of absence. In all cases of leave of absence, the student is required to complete the full curriculum to be eligible to earn the master of biostatistics degree.

Withdrawal

If a student withdraws, including involuntary withdrawal for academic reasons, tuition is prorated according to the following schedule:

- Before classes begin: 100%
- During first or second week: 80%
- During third to fifth week: 60%
- During the sixth week: 20%
- After sixth week: None

Student fees are nonrefundable after classes begin.

Voluntary withdrawals are typically initiated at the request of the student. Working with a codirector of graduate studies, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. The department of graduate studies will notify the Offices of the Registrar and Financial Aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure that they have fulfilled any responsibilities with regard to this process.

Readmission after Program Withdrawal. Students who wish to re-enter the Master of Biostatistics Program after withdrawing must provide the following to the codirectors of graduate studies:

- a statement detailing:
 - how the issues relating to the withdrawal have been addressed;

- a discussion as to why the student is re-applying to the program, including information concerning changes in situation and an explanation as to the chosen time for return; and
- an updated curriculum vitae;
- a transcript of any academic courses taken since the withdrawal.

The applicant will then be scheduled for an interview with a codirector of graduate studies. After this meeting takes place, the codirectors of graduate studies will make a final decision.

Time Limitations

A degree candidate is expected to complete all requirements within six calendar years of matriculation. Degree credit for a course expires six years after the course is completed by the student; in this case, degree credit can be obtained only by retaking the course.

Code of Professional Conduct

Students enrolled in the Master of Biostatistics Program are expected to adhere to the Duke University School of Medicine Code of Professional Conduct as detailed in the policies for all School of Medicine programs found elsewhere in this bulletin.

Tuition and Fees

2015-2016

1st year: \$34,624

2nd year: \$34,624

Budget estimates of the full cost of attendance may be found on the Office of Financial Aid website at <http://biostat.duke.edu/master-biostatistics-program/financial-support>.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided. The student health fee is mandatory for all students.

Computer Technology

All students are expected to have access to a laptop computer during class with the following capabilities:

- Running an internet browser (e.g. Internet Explorer, Safari, Google Chrome, Firefox, etc.)
- Running Microsoft Word (or another type setting software that is compatible with .docx files)
- Running the R software (<http://www.r-project.org/>)
- Running the SAS software (<http://support.sas.com/resources/sysreq/>)

Financial Support

Students are responsible for ensuring that they have the means to support themselves and the ability to pay tuition and fees due the university. Financial assistance for the Master of Biostatistics Program can take the form of program scholarships, paid assistantships, and federal need-based financial aid packages. More information about these options can be found on the program website: <http://biostat.duke.edu/master-biostatistics-program/financial-support>.

General financial aid information is available for all interested applicants by contacting the Office of Financial Aid:

Box 3067

Duke University School of Medicine

Durham, NC 27710

919.684.6649

finaid@dm.duke.edu

<http://medschool.duke.edu/education/financial-aid-office>

Graduation Requirements

To receive the master of biostatistics degree, students must successfully complete 36 course credits of graded coursework, a practicum experience, a qualifying examination, plus a master's project for which 6 course credits are given. Candidates for the master of biostatistics degree must apply to graduate through ACES in keeping with the instructions and deadlines announced by the Office of the Registrar in the School of Medicine. Failure to do so may delay conferral of the degree and issuance of the diploma, even if all degree requirements have been met.

Courses of Instruction

BIOSTAT 701: Introduction to Statistical Theory and Methods I: This course provides a formal introduction to the basic theory and methods of probability and statistics. It covers topics in probability theory with an emphasis on those needed in statistics, including probability and sample spaces, independence, conditional probability, random variables, parametric families of distributions, and sampling distributions. Core concepts are mastered through mathematical exploration and linkage with the applied concepts studied in BIOSTAT 704.

Prerequisite(s): 2 semesters of calculus or its equivalent (multivariate calculus preferred). Familiarity with linear algebras is helpful.

Corequisite(s): BIOSTAT 702, BIOSTAT 703

Credits: 3

BIOSTAT 702: Applied Biostatistical Methods I: This course provides an introduction to study design, descriptive statistics, and analysis of statistical models with one or two predictor variables. Topics include principles of study design, basic study designs, descriptive statistics, sampling, contingency tables, one- and two-way analysis of variance, simple linear regression, and analysis of covariance. Both parametric and non-parametric techniques are explored. Core concepts are mastered through team-based case studies and analysis of authentic research problems encountered by program faculty and demonstrated in practicum experiences in concert with BIOSTAT 703. Computational exercises will use the R and SAS packages.

Prerequisite(s): 2 semesters of calculus or its equivalent (multivariate calculus preferred). Familiarity with linear algebras is helpful.

Corequisite(s): BIOSTAT 701, BIOSTAT 703, BIOSTAT 721

Credits: 3

BIOSTAT 703: Introduction to the Practice of Biostatistics I: This course provides an introduction to biology at a level suitable for practicing biostatisticians and directed practice in techniques of statistical collaboration and communication. With an emphasis on the connection between biomedical content and statistical approach, this course helps unify the statistical concepts and applications learned in BIOSTAT 701 and BIOSTAT 702. In addition to didactic sessions on biomedical issues, students are introduced to different areas of biostatistical practice at Duke University Medical Center. Biomedical topics are organized around the fundamental mechanisms of disease from both evolutionary and mechanistic perspectives, illustrated using examples from infectious disease, cancer and chronic /degenerative disease. In addition, students learn how to read and interpret research and clinical trial papers. Core concepts and skills are mastered through individual reading and class discussion of selected biomedical papers, team-based case studies and practical sessions introducing the art of collaborative statistics.

Corequisite(s): BIOSTAT 701, BIOSTAT 702

Credits: 3

BIOSTAT 704: Introduction to Statistical Theory and Methods II: This course provides formal introduction to the basic theory and methods of probability and statistics. It covers topics in statistical inference, including classical and Bayesian methods, and statistical models for discrete, continuous and categorical outcomes. Core concepts are mastered through mathematical exploration, simulations, and linkage with the applied concepts studied in BIOSTAT 705.

Prerequisite(s): BIOSTAT 701 or its equivalent

Corequisite(s): BIOSTAT 705, BIOSTAT 706

Credits: 3

BIOSTAT 705: Applied Biostatistical Methods II: This course provides an introduction to general linear models and the concept of experimental designs. Topics include linear regression models, analysis of variance, mixed-effects

models, generalized linear models (GLM) including binary, multinomial responses and log-linear models, basic models for survival analysis and regression models for censored survival data, and model assessment, validation and prediction. Core concepts are mastered through statistical methods application and analysis of practical research problems encountered by program faculty and demonstrated in practicum experiences in concert with BIOSTAT 706. Computational examples and exercises will use the SAS and R packages.

Prerequisite(s): BIOSTAT 702 or its equivalent; linear and matrix algebra

Corequisite(s): BIOSTAT 704, BIOSTAT 706, BIOSTAT 722

Credits: 3

BIOSTAT 706: Introduction to the Practice of Biostatistics II: This course revisits the topics covered in BIOSTAT 703 in the context of high-throughput, high-dimensional studies such as genomics and transcriptomics. The course will be based on reading of both the textbook and research papers. Students will learn the biology and technology underlying the generation of “big data”, and the computational and statistical challenges associated with the analysis of such data sets. As with BIOSTAT 703, there will be strong emphasis on the development of communication skills via written and oral presentations.

Prerequisite(s): BIOSTAT 703

Corequisite(s): BIOSTAT 704, BIOSTAT 705

Credits: 3

BIOSTAT 707: Statistical Methods for Learning and Discovery: This course surveys a number of techniques for high dimensional data analysis useful for data mining, machine learning and genomic applications, among others. Topics include principal and independent component analysis, multidimensional scaling, tree based classifiers, clustering techniques, support vector machines and networks, and techniques for model validation. Core concepts are mastered through the analysis and interpretation of several actual high dimensional genomics datasets.

Prerequisite(s): BIOSTAT 701 through BIOSTAT 706, or their equivalents

Credits: 3

BIOSTAT 708: Clinical Trial Design and Analysis: Topics include: history/background and process for clinical trial, key concepts for good statistics practice (GSP)/good clinical practice (GCP), regulatory requirement for pharmaceutical/clinical development, basic considerations for clinical trials, designs for clinical trials, classification of clinical trials, power analysis for sample size calculation, statistical analysis for efficacy evaluation, statistical analysis for safety assessment, implementation of a clinical protocol, statistical analysis plan, data safety monitoring, adaptive design methods in clinical trials (general concepts, group sequential design, dose finding design, and phase I/II or phase II/III seamless design) and controversial issues in clinical trials.

Prerequisite(s): BIOSTAT 701 and BIOSTAT 704, or permission of the Director of Graduate Studies

Credits: 2

BIOSTAT 709: Observational Studies: Methods for causal inference, including confounding and selection bias in observational or quasi-experimental research designs, propensity score methodology, instrumental variables, and methods for non-compliance in randomized clinical trials.

Prerequisite(s): BIOSTAT 701 and BIOSTAT 702, or permission of the Director of Graduate Studies

Credits: 2

BIOSTAT 710: Statistical Genetics and Genetic Epidemiology: Topics from current and classical methods for assessing familiarity and heritability, linkage analysis of Mendelian and complex traits, family-based and population-based association studies, genetic heterogeneity, epistasis, and gene-environmental interactions. Computational methods and applications in current research areas. The course will include a simple overview of genetic data, terminology, and essential population genetic results. Topics will include sampling designs in human genetics, gene frequency estimation, segregation analysis, linkage analysis, tests of association, and detection of errors in genetic data.

Prerequisite(s): BIOSTAT 701 and BIOSTAT 704, or permission of the Director of Graduate Studies

Credits: 2

BIOSTAT 713: Survival Analysis: Introduction to concepts and techniques used in the analysis of time to event data, including censoring, hazard rates, estimation of survival curves, regression techniques, applications to clinical trials. Interval censoring, informative censoring, competing risks, multiple events and multiple endpoints, time dependent covariates; nonparametric and semi-parametric methods.

Prerequisite(s): BIOSTAT 701 and BIOSTAT 704, or permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 714: Categorical Data Analysis: Topics in categorical modeling and data analysis/contingency tables; measures of association and testing; logistic regression; log-linear models; computational methods including iterative proportional fitting; models for sparse data; Poisson regression; models for ordinal categorical data, and longitudinal analysis.

Prerequisite(s): BIOSTAT 701, BIOSTAT 702, BIOSTAT 704, and BIOSTAT 705, or permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 718: Analysis of Correlated and Longitudinal Data: Topics include linear and nonlinear mixed models; generalized estimating equations; subject specific versus population average interpretation; and hierarchical model.

Prerequisite(s): BIOSTAT 701, BIOSTAT 702, BIOSTAT 704, and BIOSTAT 705, or permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 719: Generalized Linear Models: The class introduces the concept of exponential family of distributions and link function, and their use in generalizing the standard linear regression to accommodate various outcome types. Theoretical framework will be presented but detailed practical analyses will be performed as well, including logistic regression and Poisson regression with extensions. Majority of the course will deal with the independent observations framework. However, there will be substantial discussion of longitudinal/clustered data where correlations within clusters are expected. To deal with such data the Generalized Estimating Equations and the Generalized Linear Mixed models will be introduced. An introduction to a Bayesian analysis approach will be presented, time permitting.

Prerequisite(s): BIOSTAT 701, BIOSTAT 702, BIOSTAT 704, and BIOSTAT 705, or permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 720: Master's Project: Completed during a student's final year of study, the master's project is performed under the direction of a faculty mentor and is intended to demonstrate general mastery of biostatistical practice.

Prerequisite(s): BIOSTAT 701 through BIOSTAT 706
Corequisite(s): BIOSTAT 707
Credits: 3

BIOSTAT 721: Introduction to Statistical Programming I (R): This class is an introduction to programming in R, targeted at statistics majors with minimal programming knowledge, which will give them the skills to grasp how statistical software works, tweak it to suit their needs, recombine existing pieces of code, and when needed create their own programs. Students will learn the core of ideas of programming (functions, objects, data structures, input and output, debugging, and logical design) through writing code to assist in numerical and graphical statistical analyses. Students will learn how to write maintainable code, and to test code for correctness. They will then learn how to set up stochastic simulations and how to work with and filter large data sets. Since code is also an important form of communication among scientists, students will learn how to comment and organize code to achieve reproducibility. Programming techniques and their application will be closely connected with the methods and examples presented in the co-requisite course. The primary programming package used in this course will be R.

Prerequisite(s): None; familiarity with linear algebras is helpful
Corequisite(s): BIOSTAT 702
Credits: 2

BIOSTAT 722: Introduction to Statistical Programming II (SAS): This class is an introduction to programming in SAS, targeted at statistics majors with minimal programming knowledge, which will give them the skills to grasp how statistical software works, tweak it to suit their needs, recombine existing pieces of code, and when needed create their own programs. Students will learn the core of ideas of programming (data step, procedures, macros, ODS, input and output, debugging, and logical design) through writing code to assist in numerical and graphical statistical analyses. Students will learn how to write maintainable code, and to test code for correctness. They will then learn how to set up stochastic simulations and how to work with and filter large data sets. Since code is also an

important form of communication among scientists, students will learn how to comment and organize code to achieve reproducibility. Programming techniques and their application will be closely connected with the methods and examples presented in the co-requisite course. The primary programming package focus used in this course will be SAS.

Prerequisite(s): None; familiarity with linear algebras is helpful

Corequisite(s): BIOSTAT 705

Credits: 2

BIOSTAT 801: Biostatistics Career Preparation and Development I: The purpose of this course is to give the student a holistic view of career choices and development and the tools they will need to succeed as professionals in the world of work. The fall semester will focus on resume development, creating a professional presence, networking techniques, what American employers expect in the workplace, creating and maintaining a professional digital presence and learning how to conduct and succeed at informational interviews. Practicums in this semester include an informational interviewing and networking practicum with invited guests. Students participate in a professional “etiquette dinner” and a “dress for success” module as well an employer panel.

Corequisite(s): BIOSTAT 701 through BIOSTAT 703

Credits: 0.5

BIOSTAT 802: Biostatistics Career Preparation and Development II: The purpose of this course is to further develop the student’s job seeking ability and the practical aspects of job/internship search or interviewing for a PHD program. The goal is to learn these skills once and use them for a lifetime. Modules that will be covered include: Communication skills both written and oral, interviewing with videotaped practice and review, negotiating techniques, potential career choices in the Biostatistics marketplace, and working on a team. This semester includes writing and interviewing practicum, and a panel of relevant industry speakers. Students will leave this course with the knowledge to manage their careers now and in the future.

Prerequisite: BIOSTAT 801

Credits: 0.5

BIOSTAT 901: Advanced Inferential Techniques and Theory: Stochastic processes, random walks, Markov chains, martingales, counting processes, weak convergence and basic empirical process theory and applications. Hilbert spaces for random vectors, semiparametric models, geometry of efficient score functions and efficient influence functions, construction of semiparametric efficient estimators. Applications include the restricted moment model and the proportional hazards model. The theory for M- and Z- estimators. Methods for dealing with missing data including imputation, inverse probability weighting (IPW) and the likelihood method, doubly robust IPW estimators. Instructor consent required.

Credits: 3

Master of Management in Clinical Informatics



Department Chair: Elizabeth R. DeLong, PhD
Program Director: Kevin A. Schulman, MD, MBA
Director of Academic Affairs: Ed Hammond, PhD
Operations Director: Randy Sears, MBA

The Master of Management in Clinical Informatics Program is intended to prepare graduates to work in the health care industry as informatics professionals. The curriculum provides a blending of informatics and business principles, preparing graduates to apply business principles to strategic decisions regarding evaluation, implementation, and use of informatics in the health care industry. Graduates will work in health care provider, payer, and vendor organizations.

The curriculum for the Master of Management in Clinical Informatics Program involves twelve required courses that carry 3 course credits per course and one ethics seminar course that carries no course credit, but is required to graduate. There are no elective courses and no course exemptions. Course substitutions are not permitted, and students progress through the program as a single cohort. This structure reflects the importance of the following issues: (1) the need to ensure the appropriate balance between the breadth and depth required to successfully prepare for a work role in health informatics; (2) the need to ensure that students have uniform quality with respect to depth of exposure to concepts and frameworks in a given area; and (3) the value of intact cohorts which will allow us to enhance teaming skills in repeated contexts. The curriculum capstone is the practicum which students will complete over the Summer term. The practicum will provide the students with a hands-on, real work project in which they can bring to bear the multidiscipline approach of the MMCi program.

The Master of Management in Clinical Informatics Program meets Friday through Saturday every other weekend. Students interested in the program should contact MMCi Admissions, Duke University School of Medicine, DUMC 2734, Durham, NC 27710; mmci@duke.edu, dukemmci.org.

Requirements for Admission

All students seeking admission to the Master of Management in Clinical Informatics Program must have a bachelor's degree (or the equivalent to a US bachelor's degree) from an accredited institution. It is recommended students have a background that includes college-level calculus and statistics courses, as well as computer skills.

The minimum requirements for admission to the MMCi program include:

- academic and graduate transcripts, as relevant
- responses to essay questions to assess readiness and interest
- GMAT or GRE scores that are within five years of the test date
- GMAT or GRE may be waived for applicants holding advanced degrees
- two letters of recommendation:
 - one addressing work or educational experience and conveying ability to work at the level of a master's program
 - one addressing interpersonal skills, values, or character
- interview with the director of faculty affairs by phone or in person
- international students—TOEFL Test Scores Required. May be waived for international students graduating from colleges or universities which provide instruction in English.

Academic Calendar

Dates for the Academic Terms

August 18-20	Bootcamp and Orientation
August 21-November 5	Fall Term 01
November 20-February 11	Fall Term 02
February 26-May 12	Spring Term 01
May 27-August 11	Summer Term 01
August 19, 2016	Graduation

Class Weekend Dates

August 21-22
September 4-5 and 18-19
October 2-3, 16-17, and 30-31
Exams: November 1-5

November 20-21
December 4-5 and 18-19
January 8-9, 22-23
February 5-6
Exams: February 7-11

February 26-27
March 11-12 and 25-26
April 8-9 and 22-23
May 6-7
Exams: May 8-12

May 27-28
June 10-11 and 24-25
July 8-9 and 22-23
August 5-6
Exams: August 7-11

Financial Information

Tuition and Fees

Tuition: \$52,900.00

FinancialAid

Federal Financial Aid

A US student may be eligible to borrow up to the full cost of attendance through a combination of Federal Direct Stafford and Federal Direct PLUS loans.

To be considered for federal financial aid, eligible students must complete the Free Application for Federal Student Aid (FAFSA). The School of Medicine's federal school code for the FAFSA is 002920. More information, including specific eligibility requirements, about federal need-based financial aid can be found on the FAFSA website.

Full cost of attendance budgets may be found on the Office of Financial Aid website at <http://medschool.duke.edu/education/financial-aid/student-budgets>.

Refund Policies

Refunds for withdrawal from school during fall, spring and summer semesters. In the event of death, refund of full tuition and fees for the term will be granted. In all other cases of withdrawal from the university, students may have tuition refunded according to the following schedule:

Before classes begin:	Full amount, including fees
During first or second week of classes:	80%*
During third, fourth, or fifth week of classes:	60%*
During sixth week of classes:	20%*
After sixth week:	no refund

*Fees are not refunded after the start of the term.

Academic Regulations

Registration

Registration in the Master of Management of Clinical Informatics Program is processed in accordance with instructions distributed by the Office of the Registrar of the School of Medicine prior to official registration periods.

As the program is only offered full-time, and all courses are mandatory, dropping and adding of courses is not permitted.

Attendance Policy

Students are required to attend in person all of the listed class sessions.

Leaves of Absence

Leaves of absence with anticipated readmission may be granted to students in good standing who demonstrate a compelling nonacademic reason for a leave. He or she may be granted a leave of up to one academic year. If a leave expires without the student re-entering the program, the student will be withdrawn from the program.

Transfer of Credit

Coursework taken outside of Duke University is not transferable to the Master of Management of Clinical Informatics Program.

Grading

Grades in the Master of Management of Clinical Informatics Program consist of H (honors), HP (high pass), P (pass), L (low pass), and F (fail).

An I (incomplete) indicates that some portion of the student's work is lacking for a reason acceptable to the instructor at the time grades are reported. Students will not be permitted to enroll in any course for which they have an unresolved I in a prerequisite course. A grade of I must be resolved no later than the end of the following academic semester, unless the course director specifies an earlier date by which the student must make up the deficiency. In exceptional circumstances, an incomplete that is not resolved within the designated period may be extended for a specified period with the written approval of the course director and the program director. If an incomplete is not resolved within the approved period, the grade of I becomes permanent and may not be removed from the student's record.

In most cases, a student's enrollment as a degree candidate is terminated if he or she receives a single grade of F or two grades of L in the program. For these purposes, both WF (see below) and a permanent I are considered failing grades.

Reinstatement

Students who are dismissed from the program may appeal their dismissal to the Faculty Committee. The Faculty Committee will review the appeal and consider extenuating circumstances, if any. Appeals must be submitted in writing within two weeks of notification of dismissal. Students who earn an F in a required course must retake and pass that course with MMCi. Per university policy, Fs remain on the student's transcript and figure into the GPA even after retaking the course. They also continue to count in the strike total.

Code of Professional Conduct

Students enrolled in the Master of Management in Clinical Informatics Program are expected to adhere to the Duke University School of Medicine Code of Professional conduct as detailed in the policies for all School of Medicine programs found elsewhere in this bulletin.

Satisfactory Academic Progress

Satisfactory academic progress for students in the Master of Management in Clinical Informatics Program consists of the successful completion of all requirements necessary to advance toward completion of degree requirements within the twelve month, three term program calendar.

Graduation

To graduate, students must complete at least 36 course credits in the Master of Management in Clinical Informatics Program and complete all required courses. Candidates for the MMCi degree must apply to graduate through ACES in keeping with the instructions and deadlines announced by the Office of the Registrar in the School

of Medicine. Failure to do so may delay conferral of the degree and issuance of the diploma, even if all degree requirements have been met.

A graduation ceremony is held at the end of Term 4 in August. Degrees for the Master of Management in Clinical Informatics Program will be conferred September 1 by the university and diplomas will be mailed to students in mid-October.

Curriculum Overview

The curriculum is made up of twelve required courses. Each course represents 3 course credits, for a total of 36 course credits. Each course requires twenty-seven contact or teaching hours which is met through the weekend schedule.

All students will be required to complete a noncredit ethics seminar that will meet four times throughout the year.

There are no elective courses, and no exemptions or substitutions are permitted.

Courses of Instruction

Management Courses

MMCI 557 - Principles of Strategy. This course explores business opportunities in dynamic competitive environments to develop the skills necessary to become an effective strategy analyst. You will explore the complexity of analyzing competition and assessing strategy in an era of globalization and increasing uncertainty. Credit: 3

MMCI 525 - Foundations of Corporate Finance. This course examines important issues in corporate finance from the perspective of financial managers. The concept of net present value, suitably adapted to account for taxes, uncertainty, and strategic concerns is used to analyze how investment and financing decisions interact to affect the value of a firm. Credit: 3

MMCI 517 - Spreadsheet Modeling and Decision Analysis. Explore the use of decision models to understand different business scenarios in order to make sound business decisions. The course introduces several commonly used modeling tools (decision trees, Monte Carlo simulation, and optimization) and the art of modeling in a Microsoft Excel environment. Credit: 3

MMC I 550 - Introduction to Marketing Analysis. This course introduces the principles, processes, and tools necessary to analyze markets, including customers, competitors, and companies (the 3 Cs) and to design optimal marketing programs via strategies for pricing, promotion, place, and product (the 4 P's). Credit: 3

MMCI 554 - Introduction to Operations and Supply Chain Management. Learn the basic facts and principles comprising the processes and activities involved with product delivery – from the extraction of raw materials, through transportation and processing, to the delivery of finished products to the customer. Credit: 3

MMCI 511 - Principles of Cost and Managerial Accounting. This course focuses on the design of management accounting systems for analyzing costs in the context of a firm's business model, as well as the use of managerial accounting data in planning and controlling operations. Credit: 3

MMCI 544 - Foundations of Management and Organizations. Using information strategically to transform the delivery of care requires an understanding of the relationship between organizational design and processes. Explore how technology can be a catalyst for organizational change and transformation. Credit: 3

Clinical Informatics Courses

MMCI 539 - Clinical Informatics Strategy. Health IT (HIT) solutions have been promoted as a means to reduce the cost and increase the quality of health care delivery in the US and globally. The question we try to assess in this course is how we can deploy HIT technology to achieve its promise. This question is addressed from a strategic rather than technical perspective. You will develop exploratory frameworks to help analyze potential for impact of IT implementation efforts: scale economics, network economics, and organizational innovation. You will also assess the adoption of technology within existing organizations as well as barriers to adoption. Additionally, you will explore the development of killer apps — how are health IT firms financed and what are successful business models and

concepts. Overall, you will grasp the potential for the technology to achieve the cost and quality goals that have been proposed, and the barriers to achieving this success. Credit: 3

MMCI 537 - Health IT Business Solutions. Healthcare is highly regulated and associated with special needs and risks not present in other sectors. The health information system industry echoes this specialization. This course provides an overview of principles and concepts of information technology with a focus on healthcare systems used in the healthcare setting and the industry seeking to serve these uses. You will identify the critical needs of the current health information systems including vendor and healthcare organization perspectives. The course includes an examination of electronic health records, current and emerging use of clinical information systems and applications in clinical health information systems, technologies that support health care information systems, and system design, implementation, maintenance and overview and their impact on organizational resources and efficiency. Credit: 3

MMCI 538 - Data, Information and Knowledge Representation. This course addresses different strategies for representing data, information and knowledge including description logic, information models, data elements, terminologies and ontologies. Emphasis is placed on the data, information, and knowledge framework for solving problems in health informatics. Declarative and procedural knowledge acquisition, modeling, representation and use will be explored. Credit: 3

MMCI 540 - Managerial Analysis. Organizational decisions, including accreditation, quality management, and reimbursement would be improved by relevant, timely, accurate, and complete analyses of available data for decision support. This course is designed to introduce theoretical knowledge and practical skills to evaluate and conduct analysis for secondary data available in health care settings. Using epidemiology methods as a framework, you will learn how one can evaluate or conduct secondary data analysis. You will recognize the principles of epidemiology methods applicable to health services and outcome analyses, and understand the terminology and methods for research using secondary data. Threats to validity including selection bias, confounding, information bias, and methods for their control will be discussed in a variety of settings emphasizing practical considerations. Credit: 3

MMCI 541 - Clinical Informatics Practicum. Through a team-based project approach, this capstone course applies the core concepts of the informatics and management courses to a “real world” situation at Duke Health Technology Solutions or in a similar clinical environment. You will explore the relationship between organizational strategy, implementation, and technical applications of health informatics. The practicum usually entails joining an ongoing real-world health IT project and project team, and requires a written, publication quality report of the practicum and related results. Credit: 3

MMCI 533, 534, 535 and 536 - Clinical Informatics Ethics Seminar. Each term, a case-based ethics seminar addresses ethical issues in health information technology. Topics may include the sale of prescription drug information; ownership of personal health records; data security breaches and organizational responses, and health literacy and access to electronic medical records. No credit awarded.

Master of Health Sciences Degree Programs



The Clinical Leadership Program

The Clinical Leadership Program is designed to provide clinicians with the skills necessary to become leaders within today's changing health care environment. The MHS-CL, offered through the School of Medicine's Department of Community and Family Medicine, in collaboration with The Fuqua School of Business, Duke Law School, the Sanford School of Public Policy, and the School of Nursing, provides a comprehensive core curriculum that includes, from a health delivery perspective, management theory, health care administration, financial management, economics, law, organizational behavior, informatics, quality management, and strategic planning.

Department of Community and Family Medicine

Chairman: J. Lloyd Michener, MD

Program Director: Anh N. Tran, PhD, MPH

Clinical Leadership Program Steering Committee:

Mary T. Champagne, PhD, RN; William Kane, MD; Michelle J. Lyn, MBA, MHA; J. Lloyd Michener, MD; Gwendolyn Murphy, PhD, RD; Barak Richman, JD, PhD; Justine Strand de Oliveira, DrPH, PA-C; Duncan Yaggy, PhD, Brenda Nevidjon, MSN, RN, FAAN

Academic Calendar

Distance Class Schedule

Fall 2015	August 24, 2015-November 23, 2015
Spring 2016	January 13, 2016- April 15, 2016
Summer 2016	May 11, 2016-August 10, 2016

On-Campus Class Schedule

Fall 2015	August 24, 2015-November 26, 2015
Spring 2016	January 13, 2016-April 15, 2016
Summer 2016	May 11, 2016-August 13, 2016

*All dates are subject to change

Prerequisites for Admission

The prerequisites for admission to the MHS in Clinical Leadership curriculum include:

1. A bachelor's degree or the equivalent in a clinical discipline from an accredited institution is a prerequisite for admission. Candidates should have current clinical licensure and hold clinical credentials such as, but not limited to: MD, PharmD, PA, PT, NP, RN, and RD.
2. Prior preparation in statistics. A list of course offerings as well as online/self-paced tutorials is provided for students who do not have such training.
3. Prior experience in expense and revenue budget preparation and management.
4. Administrative or managerial experience desirable.

Admissions Procedures

Applicants seeking admission either as a degree candidate or as a nondegree participant should submit the application form and the following supporting documents.

1. Official transcripts from each post-secondary institution attended. Transcripts must be sent by the institutions attended directly to the Clinical Leadership Program. Personal copies are not accepted.
2. Three letters of recommendation, including one from an individual with direct knowledge of the candidate's clinical experience and one from someone with direct knowledge of the candidate's administrative experience. All letters should be written by persons who are qualified to testify to the candidate's capacity for graduate work. The letters of recommendation should be submitted by various evaluators and should not all be submitted by evaluators affiliated with the applicant's current employer/organization or not all be submitted from evaluators at any one organization. The letters should also not be submitted by individuals for whom applicants provide supervision or oversight. The provided evaluation forms should be mailed to the Clinical Leadership Program directly by the evaluators.
3. Applicants who do not possess a graduate degree are required to provide Graduate Record Examination (GRE) General (Aptitude) Test results. Scores must not be more than five years old, and must be mailed directly to the Clinical Leadership Program from the Educational Testing Service.
4. Proof of current practice licensure. In addition, candidates must maintain licensure throughout enrollment in the Clinical Leadership Program.
5. Applicant finalists are required to complete an admissions interview.

Application Deadline

The MHS in Clinical Leadership Program accepts applications on a rolling basis. Contact the program office for spring, summer and fall admission dates. Applicants are encouraged to submit all application materials well in advance of the admission dates for the semester they wish to be considered for enrollment. Late applications cannot be guaranteed consideration. All application material, a nonrefundable \$100 application fee, and correspondence concerning the application should be sent to the Clinical Leadership Program, Department of Community and Family Medicine, Box 104425, Duke University Medical Center, Durham, NC 27710. Applicants will be notified of admission decisions shortly after admissions interviews have been completed. Materials submitted in support of an application will not be released for other purposes and cannot be returned to the applicant.

Curriculum

The Clinical Leadership Program offers participants an unparalleled educational experience that addresses the many disciplines effective leaders must master and practice in health care administration: population-based health care, financial management, health economics, health law and policy, operational management, organizational behavior, clinical informatics, quality improvement, strategic planning, and performance management. Whether it is by leading a service-oriented integrated health system, rural practice, or community clinic, the factors for study and research (such as clinical integration, community engagement, and consumer empowerment) are a constant.

This 42 credit-hour, two-year professional degree program awarded by the Duke University School of Medicine allows participants to continue practicing in their profession while attending courses online and on the Duke University campus. Those accepted into the program complete a longitudinal policy project and a seminar experience that give students the opportunity to explore topics in more depth outside the classroom setting. These experiences also allow the student to customize the program to meet individual needs.

Whether participating in the on-campus program component or the online distance-based component, Clinical Leadership students move through the program as an integrated team or cohort. The cohort creates an exceptional peer learning experience which results in relationships that continue throughout one's professional and personal life. Shared experiences through team problem-solving and project collaboration form lasting professional and personal relationships. The structure of the cohort enables classmates to start the program together and continue through the curriculum together. Because the class size is limited, students receive individual attention from faculty members.

This program is distance learning based with students enrolled for 5-8 course credits, on average, per semester. It is assumed that the candidate will continue to work in a clinical capacity while working toward the master of health sciences in clinical leadership.

Attendance and Excused Absences

Students are required to attend in person the scheduled on campus sessions for three to four days at the beginning of each semester. Absences are excused only for unexpected illness, personal emergency, or emergency clinical schedule conflict. Students must notify program faculty in advance of an expected absence. An unexcused absence will have a negative impact on the student's grade or evaluation. Individual distance course participation policies are set by the course instructors.

Registration and Drop/Add Policy

Registration in the clinical leadership program is offered on a part-time basis as it is assumed the student will continue to work in a clinical capacity during the program. All required course registrations are processed in the Office of the Registrar. As all courses are mandatory, dropping and adding courses is at the discretion of the program director.

Audits

Any student who wishes to audit a Clinical Leadership Program course must receive permission of the program director and course instructor and complete an audit application through the Clinical Leadership Program. The standard \$800 audit fee applies to each course audited.

Grading Policies

Grades for all courses within the clinical leadership curriculum are assigned on the basis of the following: H (honors), P (pass), L (low pass), and F (fail).

A grade of I (incomplete) may remain on a student's transcript for one year only. After one year, a grade of incomplete is automatically converted to an F if the course instructor does not submit a follow-up grade, based on the student's additional coursework completed. An extension to this one year limit may be granted by the program director; a request must be submitted in writing to the program director no later than thirty days prior to the expiration of the one year time limit.

Grade Appeal Process

A student wishing to appeal an official grade must present his/her appeal to the program director in writing within two weeks of the grade being posted. If requested as part of the appeals process, a student should have access to the actual checklists or comments that have been compiled as part of the grade, though identity of the evaluators submitting these data may be kept confidential. Within two weeks the program director will review the data related to the student's performance in the course and the grading criteria for the course and will make a determination regarding preserving or changing the grade. At this time, the program director will either uphold the decision of the instructor or make his/her independent decision relative to the documentation submitted.

If the student is not satisfied with the outcome of the grade appeal process, s/he may appeal to the chair of the Department of Community and Family Medicine within two weeks of receiving the decision of the program director. An appeal to the chair may be made only upon the grounds of improper procedures in the appeals process rather than continued disagreement about the outcome of the process. The chair will review the data related to the process of the appeal and determine whether the process was valid. If s/he finds the process valid, the decision is final and binding. At this time, the registrar's office will be notified of the final grade and it will be reflected on the student's permanent record. If the chair finds the process invalid, a new review will be conducted by an independent observer who is also a member of the program steering committee.

Satisfactory Academic Progress

Satisfactory academic progress for students in the Clinical Leadership Program consists of the successful completion of all requirements necessary for the advancement from one semester to the next. This includes successful completion of the clinical leadership seminar and at least one core course each semester. During the clinical leadership longitudinal project period the student must maintain consistent progress with their cohort in meeting designated project deadlines. In unusual circumstances (including illness, academic remediation, or irregular sequencing of courses) the determination of satisfactory progress for academic purposes is made by the program director of the Clinical Leadership Program.

For financial aid purposes, federal regulations establish the maximum time frame for completion of the program at 150 percent of the minimum time required to complete the program. Any student exceeding the 150 percent maximum time frame is ineligible for Title IV (Stafford and Perkins loans) student financial aid funds.

Academic Status—(Probation, Withdrawal, Dismissal) Policy

A student who receives a low pass grade in any two of the required courses will be placed on academic probation. An academic status of probation is noted on the transcript at the end of the semester in which it occurs. If a student receives at least a pass grade for all courses during the following probationary semester, s/he will be removed from academic probation. The academic status of probation is removed from the transcript once the student returns to a good academic standing.

Dismissal

The failure of any required course prevents a student from continuing in the program. Also, a student who receives a low pass grade in three of the required courses will be dismissed from the program. Students dismissed for academic reasons cannot be readmitted.

Appeal of Academic Status Policy

A student wishing to appeal an academic status must begin the process within two weeks of receiving a status change notification. A written request for appeal should be sent to the program director. Within two weeks the program director will gather the data related to the student's performance in the program. A three-member

committee of faculty and steering committee members will be convened to review the documentation and make a determination regarding preserving or changing the status. The appeals committee's decision will be communicated to the student within six weeks of the initial application for appeal. The appeal committee's decision is final.

Leave of Absence

A leave of absence will be granted upon request at the discretion of the program director.

Withdrawal

If a student withdraws, including involuntary withdrawal for academic reasons, tuition is refunded according to the following schedule:

Before classes begin:	Full amount
During first or second week:	80%
During third to fifth week:	60%
During sixth week:	20%
After sixth week:	none
Student fees are nonrefundable after classes begin.	

Historically, voluntary withdrawals are initiated at the request of the student. Working with the program director, the student confirms the request to withdraw. A mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. The program director will notify the Office of the Registrar in the School of Medicine via letter or attrition notice as appropriate. The student should also contact the Office of the Registrar to ensure that they have fulfilled any responsibilities with regard to this process. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The student is responsible for notifying the Office of Financial Aid in the School of Medicine, and the Office of Financial Aid may revoke any financial aid that has been disbursed. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew (W-Withdrawal) on the specific effective date.

Reenrollment after course withdrawal. To meet the credit hour requirement for program completion, students may enroll again in the same course from which they previously withdrew when it is offered again or with the program director's approval, enroll in another course with credit hours equal to that of the course from which the student previously withdrew.

Readmission after Program Withdrawal. Students who wish to re-enter the Clinical Leadership Program after withdrawing must provide the following to the program director:

- a statement detailing:
 - the reason(s) for withdrawing from the program, including relevant history leading up to the decision;
 - how the issues relating to those reasons have been addressed;
 - a discussion as to why the student is re-applying to the program, including information concerning changes in situation and an explanation as to the chosen time for return; and
 - a chronological list and brief description of actions since withdrawing from the clinical leadership program;
- an updated curriculum vitae;
- a transcript of any academic courses taken since the withdrawal; and
- a letter of reference from a person with whom the student worked during the withdrawal period.

The applicant will then be scheduled for two interviews with either administrative staff or program faculty. After these meetings take place, a committee composed of the program director, division chief, and one steering committee member convenes to review the information submitted by the applicant, the interview reports, and the student's previous, academic file and to determine if readmission is appropriate. The decision of the committee, which is final, is provided in writing to the applicant and to the financial aid and registrar's offices.

Code of Professional Conduct

Clinical Leadership students and faculty are governed by the School of Medicine Code of Professional Conduct, found elsewhere in this bulletin.

Statement of Professionalism

1. Commitment to Learning
 - Actively seeks teaching and feedback and uses them to improve knowledge and skills
 - Makes significant contributions to team learning

2. Respect for Others
 - Consistently respectful of others and able to adjust to differences in personal or cultural style
 - Shares learning materials and information appropriately with team and fellow students
3. Honesty, Reliability, and Integrity
 - Provides a standard of integrity that inspires others; exceeds expectations for reliability
4. Conscientiousness
 - Meets deadlines for reports, assignments, and exams and appropriately seeks excused absences when necessary
 - Completes nonacademic compliance requirements by deadlines and does not need reminders (e.g., course registration, course evaluations)
5. Professional Boundaries
 - Consistently exhibits sensitivity and appropriate social interaction with faculty, staff, and peers
 - Meticulous about safe-guarding confidential information

Costs and Financing

Tuition for the 2015-2016 academic year is \$1365 per unit. Duke employees may be eligible for the University's Educational Assistance Program. Other sources of support may exist in clinical departments; prospective applicants should consult with program directors and division chiefs regarding potential funding sources.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided.

All entering graduate and professional students are required to present a certificate of immunization which documents that the student has received the immunizations required by law and immunizations required by Duke University for Health Science and undergraduate students. For additional information see <http://studentaffairs.duke.edu/studenthealth/immunization-compliance>.

Computer and Technology Policy

All students should possess computer skills that include proficiency with word processing, e-mail, spreadsheets, Internet research, and presentation programs. All students in the Master of Health Sciences in Clinical Leadership Program are required to have access to a desktop or laptop computer with consistent and reliable high-speed internet access. Mobile devices such as tablets or phones can be used for some areas of the program but should be considered a backup or secondary device. A computer headset with microphone is a required accessory for online class meetings.

Minimum system requirements of a Windows-based system are that the operating system be no older than Windows XP. Computing devices should have file space available to install and run apps and computer programs used for course work and communications. Current versions of internet browsers (i.e., Internet Explorer, Mozilla Firefox, Safari) are required for access to Sakai, Duke University's online learning management system, and WebEx, the conferencing system used for live sessions.

Financial Aid

Qualified students may be eligible for up to \$20,500 in unsubsidized Federal Stafford Student Loans. Limited scholarship funds are also available. All financial aid awards are made on the basis of documented financial need. Additional information is available from the Office of Financial Aid at (919) 684-6649, finaid@dm.duke.edu, or online at <https://medschool.duke.edu/education/student-services/office-financial-aid>.

Graduation Requirements

The master of science in clinical leadership is a professional degree awarded by the Duke University School of Medicine. The degree requires completion of 26 course credits of graded coursework plus five seminars for which a total of 10 course credits are given and a team project for which 6 course credits are given for a total of 42 course credits.

Commencement Information

Graduation exercises are held once a year in May when degrees are conferred, and diplomas issued to those who have completed program requirements by the end of the spring semester. Those who complete degree requirements at the end of the summer or fall terms receive diplomas dated September 1 or December 30, respectively. The mailing of September and December diplomas occurs within 30 days of the graduation date as diplomas are issued after approval by the Academic Council and the Board of Trustees.

Because university graduation ceremonies are only held at the end of the spring term, graduates with a degree date of December or September are invited to participate in the May commencement program immediately following their actual graduation date.

Courses of Instruction

CLP-200. Perspectives on Health Care. Students will explore the principles behind the forces impacting the dynamic health care environment. Building upon topics covered in other core courses, students will be exposed to current issues and strategies regarding population health analysis and decision-making through the use of case studies and interaction with leaders in health care planning, financing, and programming. Credit: 2. Graham

CLP-201. Management Leadership and Team Development. The course focuses on leading and managing within complex healthcare systems, specifically through the process of developing and managing teams. Within the context of team management leadership, students will learn about changing and/or implementing system structure in a healthcare setting. Discussion will focus on adaptive, non-traditional managing techniques. Credit: 2. Graham

CLP-202. Use of Data to Support Change in Organizational Structure. Through interaction with leaders from the private and public health care sectors, students will analyze the current state of health care delivery in the United States with a focus on the impact of changing organizational structures and rapidly advancing technologies. Discussion leaders will focus on the health care workforce, the economic framework of the health care industry, changing private and public responsibilities, and opportunities for entrepreneurial endeavors. Credit: 2. Graham

CLP-203. Management of Self. Students will be challenged to apply the skills and knowledge they have acquired through the program to develop a strategic career management plan. More specifically, the course is intended to expose the students to strategies to delineate a personal vision, mission and values; determine and achieve career goals; explore existing beliefs and strategies, and seek ways to improve personal strengths and mitigate weaknesses. Credit: 2. Graham

CLP-204. Leading in a Chaotic Environment. Students will meet with industry experts on health care law and policy to work through case studies in risk, regulation, and antitrust. They will become familiarized with the challenging issues of working in the health care environment develop a plan of action for the implementation of their leadership roles and responsibilities when they return to their own work environment. Credit: 2. Graham

CLP-205. Clinical Leadership Project. The Clinical Leadership Project helps a real client decide what to do about a problem in health policy, financial planning, or administration. Its purpose is to recommend and defend a specific course of action. Students work as part of a team to complete the project. The project is divided into two parts, with the first semester being devoted to client and problem identification and developing and defending a written prospectus. The second semester is devoted to the completion and final defense of the project in its entirety. Credit: 3, 3. Kane, Yaggy

CLP-206. Quality Measurement and Management. The course provides a survey of all related aspects of quality management including a review of HEDIS, NCQA, JCAHO structures and guidelines. Special emphasis is placed on outcomes, clinical guidelines, evidence-based medicine, disease management, interdisciplinary team care, CQI/TQM, role of purchaser, and patient satisfaction. Credit: 3. Bradley

CLP-207. Operational Management. The course covers the practical aspects of communication, meeting management, and human resource management. Topics include performance appraisal, conflict management, demand management, aligning incentives, labor substitution/consolidation, role of extenders, analytical decision-making, project management, and process (systems) analysis. Credit: 3. Lyn

CLP-210. The Successful Clinical Leader. Primarily taught in a case-based format, this course offers a review and application of the fundamentals of leadership, management, strategy, and finance as they apply to decision making in administrative medicine. Credit: 3. Sangvai

CLP-211. Fundamentals of Healthcare Finance. This course provides a background to healthcare finance including basic corporate finance, financial and cost accounting, and investment. Students will develop sound financial management and budget planning skills. Credit: 4. Sangvai

CLP-212. Informatics for Clinicians. Clinical overview of electronic medical records with a focus on the emergent clinical topics of registry development to facilitate disease management, clinical decision support and design strategies to improve clinician acceptance and utilization. Course will focus on strategies to help clinicians work with programmers to develop clinical systems that meet clinician needs working within the constraints of their own organization and electronic medical records system. Credit: 3. Tcheng

CLP 213. Health Care Organization and Policy. This course considers the interplay of various elements of the US health care delivery system: finance, reimbursement, legislation, health professional workforce, individual consumers, population and public health. The history, sociology, current trends and projected future of US health and health care are reviewed and imagined in this multidisciplinary course offering. Credit 3 Strand de Oliveira

CLP 214. Population Health Management Approaches. Provides an overview of working successfully in the area of population health management and care coordination. Gives health care professionals an understanding of the systems and tools necessary to work successfully with population health models, processes, staffing, training, patient/stakeholder engagement, and evaluation. Credit: 3. Silberberg

CLP 215. Health Care Operations: Perspectives for Continuous Improvement. Students develop a toolkit for continuous improvement within health care organizations and systems and explore selected quality, ethical, and human resources issues in health care management. Students will apply concepts to practice using quality improvement parameters, ethics modeling, and analysis of case studies. Credits: 3 Burton

CLP-216. Fundamentals of Social Media. Students will learn about internet based, electronic communications and how Social Media can be used in a business environment. Students will explore how to use Google Analytics, Blogging, Email, Linked-In, Webinars, Twitter and other media as a part of an effective media plan. Credit: 1 Van Noord

The Clinical Research Training Program

Department Chair: Elizabeth R. DeLong, PhD

Program Director: Steven C. Grambow, PhD

Co-Directors: Kevin P. Weinfurt, PhD; John W. Williams, MD, MHSc

Associate Director: Scott M. Palmer, MD, MHSc

Program Coordinator: Gail D. Ladd

This Duke University School of Medicine program provides formal academic training in the quantitative and methodological principles of clinical research. In contrast to a public health degree which focuses on epidemiology, this program is designed primarily for clinical fellows who are training for academic careers. The program offers formal courses in clinical research design, statistical analysis, medical genomics, research management and responsible conduct of research. Students who complete a prescribed course of study in the training program are awarded a master of health sciences in clinical research degree by the School of Medicine.

The Clinical Research Training Program is offered by a core faculty from the Department of Biostatistics and Bioinformatics and the Department of Medicine who have extensive experience in clinical research, and with the participation of other members of the medical center faculty who have expertise in relevant areas.

Academic Calendar

Fall 2015

Monday, July 20	Fall course registration begins
Friday, July 24	Fall course registration closes
Monday, August 31	First day of class. New student orientation
Monday, September 7	Labor Day Holiday. No class
Friday, September 11	Drop/Add ends
Monday, November 16	Registration begins for Spring Semester 2016
Friday, November 20	Registration ends for Spring Semester 2016

Tuesday, November 24 Thanksgiving recess begins
Monday, November 30 Classes Resume
Thursday, December 17 Last day of class

Spring 2016

Monday, January 11 Spring Semester begins. First day of Drop/Add
Monday, January 18 Martin Luther King, Jr. Day. No class
Friday, January 29 Drop/Add ends
Monday April 25 Last day of class
Sunday, May 8 Graduation exercises; conferring of degrees

Degree and Nondegree Admission

All persons who wish to take courses in the Clinical Research Training Program, even on a nondegree basis, must be admitted to the program. An advanced degree in a clinical health science from an accredited institution is a prerequisite for admission either as a degree candidate or as a nondegree student. This program is only available to medical students, fellows and faculty of Duke, the National Institutes of Health, and the Brazilian Clinical Research Institute. Detailed instructions and the online application can be found on the program's website at <http://crtp.mc.duke.edu>.

A complete application for admission, either as a degree candidate or as a nondegree student, consists of the application form and the following supporting documents: (1) a current curriculum vitae (CV); (2) an official transcript from graduate institution attended including medical school transcripts; one letter of evaluation written by persons qualified to testify to the applicant's capacity for graduate work.

Any applicant whose first language is not English is required to submit official scores from the test of English as a second language (TOEFL). Test scores must not be more than two years old and an official copy must be sent to Duke University. Personal, attested, or notarized copies are not acceptable. In lieu of TOEFL scores, applicants may submit their scores for another English language proficiency test, the International English Language Testing System (IELTS) test. Applicants who have earned a bachelor's degree or higher from a regionally accredited institution in the United States, or from an accredited university where English is the verified SOLE language of instruction, are exempt from submitting English language proficiency test results.

Any applicant who is admitted to an academic program of Duke University and who is not a US citizen or national must provide documentation to verify his or her immigration status with Duke Visa Services prior to enrolling in coursework. This includes Lawful Permanent Residents ("green card"), Conditional Residents, Asylees, and Refugees. The Clinical Research Training Program will provide additional information regarding this documentation with letters of acceptance to the program.

Program of Study

The degree requires 24 course credits of graded coursework and a research project for which 12 course credits are given. Five courses (Clinical Research Training Program 241, 242, 245, 253 and 254) constitute 16 course credits that are required for all degree candidates (see Courses of Instruction). The student's clinical research activities provide the setting and the data for the project, which serves to demonstrate the student's competence in the use of quantitative methods in clinical research. The program is designed for part-time study, which allows the fellow/student to integrate the program's academic program with clinical training.

Attendance Policy

Attendance in scheduled classes is a requirement for all individuals enrolled in the program. While we recognize the clinical and research responsibilities faced by many of our students, the importance of class attendance and participation is essential to learning, both to the individual student and the class as a whole.

Students are expected to attend classes regularly and complete assigned coursework in a timely fashion in accordance with the expectations of their instructors. CRTP course directors will clearly communicate course specific attendance policies and expectations in their course syllabi. If these policies are not clear, it is the responsibility of the student to ask the course director for clarification.

Students are expected to notify and negotiate excused absences from course activities with the course director in situations such as illness or health care appointments, attendance at scientific or professional meetings, personal or

family emergency, or major life events. Course directors are responsible for making clear to students which portions of their courses require attendance and any limit on excused absences without negative consequence. These absences should be negotiated in writing (e-mail or letter) as far in advance as possible and a plan established for completion of any activity or work missed. Absences announced on short notice due to illness or emergency may still be excused with proper notification of the course director and unannounced absences may be excused in cases of incapacitation to the point of inability to make these contacts.

Any absence without prior notification of the course director is considered unexcused unless documentation of inability to make those contacts is provided. Any absence not approved by a course director for a required part of a course is considered unexcused. An unexcused absence may have a negative impact on the student's grade or evaluation if so specified in the course syllabus.

Students are strongly encouraged to consult their schedules for the academic term and discuss any planned absences (particularly if multiple class sessions will be missed during the term), with their course director during the drop/add period to determine (a) whether accommodation is possible and (b) arrangements for completing assignments for absences. It is the responsibility of the course director to determine the arrangements (e.g., early submission of work, an alternative assignment, rescheduling an exam, etc.) to be followed when an absence is excused. If accommodation cannot be made, the student may consider whether to remain in the course or drop it in favor of another course that might more easily accommodate their schedule.

Registration and Drop/Add Policy

Registration in the Clinical Research Training Program is processed in accordance with instructions distributed by the Office of the Registrar of the School of Medicine prior to official registration periods. Students may drop courses for which they have registered earlier or add courses during each semester's Drop/Add period, which is the first three weeks of class. (see *Withdrawal from a Course* and *Withdrawal from Program*).

Grades

Grades in the Clinical Research Training Program consist of HP (high pass), P (pass), L (low pass), and F (fail). There are selected courses in the curriculum that use a pass/fail grading scale. A notation will be made on the official transcript that the grading scale for the course is P/F. Courses that utilize a pass/fail grading scale are noted in the course description.

In addition, an I (incomplete) indicates that some portion of the student's work is lacking for a reason acceptable to the instructor at the time grades are reported. Students will not be permitted to enroll in any course for which they have an unresolved I in a prerequisite course. In any case, a grade of I must be resolved no later than the end of the following academic semester, unless the course director specifies an earlier date by which the student must make up the deficiency. In exceptional circumstances, an Incomplete that is not resolved within the designated period may be extended for a specified period with the written approval of the course director and the program director. If an Incomplete is not resolved within the approved period, the grade of I becomes permanent and may not be removed from the student's record.

Satisfactory Academic Progress

Satisfactory academic progress for students in the Clinical Research Training Program consists of the successful completion of all requirements necessary to advance toward completion of degree requirements within a six year time limitation, or for non-degree students, toward attainment of individual training goals, within the constraints imposed by course prerequisites. This includes meeting the requirements and standards for completion of the research project as described in student orientation sessions and program guidelines, whether print or web-based.

Academic Status—(Probation, Suspension, Withdrawal, Dismissal) Policy

A student who receives a low pass grade in any course will be placed on academic probation. If a student receives at least a pass grade for all courses during the probationary semester, s/he will be removed from academic probation. The Office of the Registrar in the School of Medicine will be notified of the student's academic status and will be noted on the student's transcript at the completion of the semester(s) during which the status is assigned.

The failure of any course prevents a student from continuing in the program. Also, a student who receives a low pass grade in three of the required courses will be dismissed from the program. Students dismissed for academic reasons cannot be readmitted.

A student's enrollment as a degree candidate is terminated if he or she receives a single grade of F or two grades of L in the program. For these purposes, both WF (see below) and a permanent Incomplete are considered to be failing grades.

Appeal of Academic Status Policy

A student wishing to appeal an academic status must begin the process within two weeks of receiving a grade of LP or F. A written request for appeal should be sent to the program director. Within two weeks, the program director will gather the data related to the student's performance in the program. A three-member committee of faculty and steering committee members will be convened to review the documentation and make a determination regarding preserving or changing the status. The appeals committee's decision will be communicated to the student within six weeks of the initial application for appeal. The appeal committee's decision is final.

Examining Committee

Three faculty members constitute an examining committee to certify that the student has successfully completed the research project requirement for the degree. The committee must include a clinical investigator and a statistician, each of whom is a member of the faculty of the Clinical Research Training Program (CRTP). The third member of the committee should be a faculty member who has substantive knowledge in the area in which the clinical research project is conducted; for clinical fellows, this committee member is often the fellow's mentor. The chair of the committee must be a member of the CRTP faculty.

Time Limitations

A degree candidate is expected to complete all requirements within six calendar years of matriculation. Degree credit for a course expires six years after the course is completed by the student; in this case, degree credit can be obtained only by retaking the course.

Withdrawal from a Course

A course may be dropped at the student's discretion during the first three weeks of class; no grade is recorded and all tuition is refunded. If a course is dropped later in the term, no tuition is refunded and the status of the student at the time of withdrawal is indicated on the permanent record as WP (Withdrew Passing) or WF (Withdrew Failing).

Withdrawal from Program

If a student withdraws from the program during the first three weeks of class, including involuntary withdrawal for academic reasons, all tuition is refunded. If a student withdraws from the program later in the term, no tuition is refunded and the status of the student at the time of withdrawal from the program is indicated on the permanent record as WP (withdrew passing) or WF (withdrew failing).

Voluntary withdrawal from the program is initiated at the request of the student. Such requests must be submitted in writing to the program coordinator. The program coordinator will notify the Office of the Registrar, the program director, and course faculty as appropriate given the student's enrollment status at the time of withdrawal. It is the student's responsibility to contact the bursar's office regarding fulfillment of financial obligations to the university.

Reinstatement to the Program

Students who wish to re-enter the Program after withdrawing must provide the following:

- a statement detailing:
 - the reason(s) for withdrawing from the program, including relevant history leading up to the decision;
 - how the issues relating to those reasons have been addressed;
 - a discussion as to why the student is re-applying to the program, including information concerning changes in situation and an explanation as to the chosen time for return;
- an updated curriculum vitae;
- a transcript of any academic courses taken since the withdrawal; and
- a letter of reference from a person with whom the student worked during the withdrawal period.

The applicant will meet with the Program Director. After this meetings take place, a committee composed of the program director, codirectors, and assistant director convenes to review the information submitted by the applicant, the student's previous academic file, and determines if readmission is appropriate. The decision of the committee, which is final, is provided in writing to the applicant and to the financial aid and registrar's offices.

Computer Technology

All students should have basic proficiency with word processing, e-mail, spreadsheets, Internet research, video conferencing (e.g., Webex), and presentation software programs/apps. All students are required to have access to a current model personal computer with high-speed Internet access, a broadband connection to the Internet (DSL, cable, or satellite), and an up-to-date internet browser (e.g., Firefox, Internet Explorer, Safari).

Code of Professional Conduct

Students enrolled in the Master of Clinical Research Training Program are expected to adhere to the Duke University School of Medicine Code of Professional conduct as detailed in the policies for all School of Medicine programs found elsewhere in this bulletin.

Duke Community Standard

Duke University is a community of scholars and learners, committed to the principles of honesty, trustworthiness, fairness, and respect for others. Students share with faculty and staff the responsibility for promoting a climate of integrity. As citizens of this community, students are expected to adhere to these fundamental values at all times, in both their academic and nonacademic endeavors.

By accepting admittance to this program, students demonstrate their commitment to uphold the values of the Duke University community. Under the Duke Community Standard, students affirm their commitment not to lie, cheat, or steal in academic endeavors, nor accept the actions of those who do. In addition, as the School of Medicine is an integral part of the Duke Community, students affirm their commitment to conduct themselves responsibly and honorably in keeping with the Duke University School of Medicine Honor Code of Professional Conduct as detailed elsewhere in this bulletin.

Tuition

Tuition for the 2015-2016 academic year is \$780 per credit hour. Faculty may be eligible for the university's Educational Assistance Program. Other sources of support exist in some clinical departments; prospective students should consult with program directors and division chiefs regarding potential funding sources.

Full cost of attendance budgets may be found on the Office of Financial Aid website at <https://medschool.duke.edu/education/student-services/office-financial-aid>.

Graduation

Candidates for the master of health sciences in clinical research degree must apply to graduate through ACES in keeping with the instructions and deadlines announced by the Office of the Registrar in the School of Medicine. Failure to do so may delay conferral of the degree and issuance of the diploma, even if all degree requirements have been met.

Graduation exercises are held once a year in May when degrees are conferred, and diplomas are issued to those who have completed requirements by the end of the spring semester. Those who complete degree requirements at the end of the summer or fall terms receive diplomas dated September 1 or December 30, respectively.

In addition to completing the required course of study, degree candidates must submit to the program the required documentation demonstrating successful completion of the research project no later than April 15 for May graduation, July 31 for September graduation, and November 30 for December graduation.

Courses of Instruction

CRP-241. Introduction to Statistical Methods. This course is an introduction to the fundamental concepts in statistics and their use in clinical research. Through class lectures, in class demonstrations, directed in class exercises and discussion of representative research reports from peer-reviewed journals, students are introduced to the core concepts in statistics, including: composition of data sets, descriptive statistics, hypothesis formulation, statistical significance, confidence intervals, statistical power, common statistical tests and basic statistical models. Basic statis-

tical computations and introductory data analysis will be performed using R, a multi-platform (Windows, UNIX, Mac OS), free software environment for statistical computing and graphics. Prerequisite: None. Credit: 4.

CRP-242. Principles of Clinical Research. The emphasis is on general principles and issues in clinical research design. These are explored through the formulation of the research objective and the research hypothesis and the statistical methods used in analysis of each type. Emphasis is placed on the traditional topics of clinical epidemiology such as disease etiology, causation, natural history, diagnostic testing, and the evaluation of treatment efficacy. The course content promotes an understanding that allows the student to classify studies as experimental or observational, prospective or retrospective, case-control, cross sectional, or cohort; this includes the relative advantages and limitations and the statistical methods used in analysis of each type. In addition, an introduction to ethical issues in clinical research is included. Corequisite: CRP 241. Credit: 4.

CRP-243. Introduction to Medical Genetics. Coverage is provided of the fundamental knowledge in human genetics and genetic systems of the mouse and other model organisms. Topics include: introduction to concepts of inheritance (DNA, chromatin, genes, chromosomes); the human genome (normal genetic variation, SNPs, comparative genomes, molecular mechanisms behind inheritance patterns, and mitochondrial genetics); mouse genetics (classical mouse genetics, genotype- and phenotype-driven approaches, QTL mapping); microarrays (expression, genomic, ChIP (chromatin IP on chip), bioinformatics and use of genome databases); genetic association studies (haplotype blocks, study design in complex disease and approaches to complex disease gene identification, pharmacogenetics and pharmacogenomics). Prerequisite: None. Credit: 2.

CRP-245. Statistical Analysis. This course extends CRP 241 (Introduction to Statistical Methods) which primarily considers statistical models with a single predictor, to models containing multiple predictors. We cover models with continuous outcomes (regression, analysis of variance, analysis of covariance), dichotomous outcomes (logistic regression), and time to event outcomes (survival models). Prerequisite: CRP 241. Credit: 4.

CRP-247. Clinical Research Seminar. This seminar integrates and builds on the core courses (CRP 241, 242, 245) to provide practical experience in the development and critique of the methodological aspects of clinical research protocols and the clinical research literature. Assigned readings are drawn from contemporary literature and include both exemplary and flawed studies. Prerequisites: CRP 242 and CRP 245. Credit: 2.

CRP-248. Clinical Trials. Fundamental concepts in the design and analysis of clinical trials are examined. Topics include protocol management, sample size calculations, determination of study duration, randomization procedures, multiple endpoints, study monitoring, and early termination. Prerequisite: CRP 245. Credit: 2.

CRP-249. Health Services Research. Research methods in health services research are explored. Topics include measurement of health-related quality of life, case mix and comorbidity, quality of health care and analysis of variations in health care practice. Advantages and disadvantages of studies that use large databases as well as advanced methods in analysis and interpretation of health services outcomes are addressed. This includes application of traditional research designs (e.g., randomized trials) to address health services research questions and the interface between health services research and health policy. Prerequisites: CRP 242 and CRP 245. Credit: 2.

CRP-252. Principles of Clinical Pharmacology I. This course provides a basis for understanding the scientific principles of rational drug therapy and contemporary drug development, with emphasis on pharmacokinetics, methods for drug analysis, drug metabolism, and pharmacogenetics. Topics include the physiologic and pathophysiologic factors involved in drug absorption, distribution, metabolism and elimination, determinants of variability in drug responses, inter- and intra-patient variability in pharmacokinetics/pharmacodynamics, and drug interactions. This course also provides an introduction to common pharmacokinetic and pharmacodynamic modeling approaches. Prerequisite: Basic knowledge of calculus. Credit: 2.

CRP-253. Responsible Conduct of Research. This course explores a variety of ethical and related issues that arise in the conduct of medical research. Topics include human subjects and medical research, informed consent, ethics of research design, confidentiality, diversity in medical research, international research, relationships with industry, publication and authorship, conflict of interest, scientific integrity and misconduct, intellectual property and technology transfer, and social and ethical implications of genetic technologies and research. This course is designed to meet and exceed the NIH requirement for training in Responsible Conduct of Research. Prerequisite: CRP 242. Credit: 2.

CRP-254. Research Management. This course addresses operational issues that arise in the conduct of a clinical research project. Topics include administration (human resources, project management, budget development and

management), data management systems (databases, case report forms, data acquisition, quality assurance and quality control [QA/QC], monitoring and auditing), regulation (Investigational New Drug [IND]) applications, good clinical practice [GCP], and the Health Insurance Portability and Accountability Act [HIPAA]), and sponsorship (sources, sponsor motivations, identification of sponsors). Prerequisite: CRP 242. Credit: 2.

CRP-257. Proteomics and Protein Biology in Medicine. Platform technologies and computational methodologies for protein profiling and interaction analysis are introduced. The platform technologies covered include mass spectroscopy, 2D gel electrophoresis, surface plasmon resonance, protein arrays and flow cytometry. Structural biology and high-throughput screening methods are also discussed. Prerequisite: None. Credit: 2.

CRP-258. Principles of Clinical Pharmacology II. As a continuation of CRP 252, this course includes the topics of drug transport mechanisms and their relevance in pharmacokinetics and drug metabolism, dose response and concentration response analysis, biological markers of drug effect, and adverse drug reactions. In addition, emphasis is given to optimizing and evaluating the clinical use of drugs, as well as drug therapy in special populations (children, elderly adults, pregnant and nursing women). A special course module focuses on the processes of drug discovery and development, and the regulatory role of the FDA. Prerequisite: CRP 252. Credit: 2.

CRP-259. Decision Sciences in Clinical Research. Modeling the potential impact of a health intervention on disease outcomes can be extremely useful in gaining an understanding of the underlying biology or epidemiology of a disease, in designing research studies, and in assessing whether an intervention is economically feasible. This course focuses on basic modeling techniques, with an emphasis on decision analysis and cost-effectiveness analysis, and the application of these techniques to the student's own research. Topics covered include basic decision theory, basic principles of economic analysis in health care, decision trees, Markov models, infectious disease models, and economic analysis of clinical trials, how to review a decision/cost-effectiveness analysis, and the application of models for research and policy analysis. Prerequisite: CRP 242. Credit: 2.

CRP-262. Systematic Reviews and Meta Analysis. This course provides a practical foundation for systematic reviews involving quantitative synthesis (quantitative meta analysis). Through directed exercises, students learn when and how to perform quantitative synthesis using freely available software. Topics include: computing effect sizes, computing a combined effect, fixed effect vs. random effects analyses, heterogeneity in effect sizes, and methods to detect publication bias. This course is offered in even-numbered years only. Prerequisite CRP 242. Corequisite CRP 245. Credit: 2.

CRP-263. Longitudinal Data Analysis. Longitudinal methods are required in the analysis of two types of study designs, those that involve questions about systematic change over time and those that involve questions about whether and when events occur. The first type is characterized by repeated observations of the same variables over time, allowing the analysis of temporal changes. In the second type, commonly referred to as time-to-event designs, the outcome of interest is the time to an event such as death or hospitalization. The course covers the design, analysis and interpretation of these types of studies. Various models, methodological issues and methods of analysis are discussed and demonstrated using R, SAS and Enterprise Guide. Lectures are supplemented with readings from texts and journal articles. Prerequisite: CRP 245. Credit 2.

CRP-264. Introduction to Immunology in Clinical Research. This course provides an introduction to basic concepts of immunology, clinical assessment of immune function, and the fundamental importance of immune mechanisms in human disease. Topics include innate and adaptive immunity, regulatory mechanisms, and inflammation. Translational techniques used in immune assessment are described in the context of relevant clinical examples. Emphasis is placed on the application of basic immunology to human diseases in oncology, infections, autoimmunity and transplantation. Prerequisite: None. Credit: 2

CRP-265. Molecular Biology Techniques. This course is an introduction to basic laboratory techniques in molecular biology. Through lectures and hands on laboratory experiments students are introduced to methods required to perform basic molecular biology techniques. Techniques covered in the workshop include polymerase chain reaction (PCR), Western blotting, nucleic acid isolation, cloning, protein expression and siRNA amongst others. No laboratory experience is required. Prerequisite: Permission of the instructor. Credit: 2.

CRP-266. Concepts in Comparative Effectiveness Research. This course provides students a foundation in comparative effectiveness research (CER) as applied to existing data sets. Through course readings, in-class discussions, and development of an abstract for submission to a scientific meeting, students develop research skills and competencies related to understanding, conducting and interpreting CER. Topics include: quasi-experimental study

designs, sensitivity analysis and statistical adjustment in quasi-experiments, controlling for bias in observational data, and critical review of clinical literature. Prerequisite: CRP 242. Credit: 2.

CRP-267. Special Topics. This course focuses on new perspectives and methods in clinical and translational research, with specific content to be determined each semester. Prerequisite: None. Credit: 2.

CRP-270. Research. An individualized research project under the direction and supervision of the student's mentor and examining committee forms the basis for this culmination of the program of study leading to the degree. Credit: 12.

CRP-271. Patient-Reported Outcomes in Clinical Research. Patient-reported outcomes (e.g., fatigue, pain, physical functioning, social functioning, etc.) can provide great value to research but present significant challenges. This course provides students with the knowledge necessary to incorporate patient-reported outcomes into observational studies and clinical trials. Topics include the different types and suitability of measures, the development of new measures, and techniques for analyzing and interpreting patient-reported outcomes. Prerequisite: 242. Credit: 2.

CRP 272 R Programming Boot Camp. This course is an introduction to the use of R and RStudio for data management. The primary goal is to empower the student to restructure, clean and otherwise prepare data sets for subsequent analysis using R and RStudio. This is accomplished through directed exercises in which fundamental programming and good documentation practices are emphasized. Prerequisite CRP 241. Credit: 1.

CRP 273 Implementation and Dissemination of Health Care Research. Implementation research (1) seeks to understand the processes and factors that are associated with successful integration of evidence-based interventions within a particular setting (e.g., a worksite or school), (2) assesses whether the core components of the original intervention were faithfully transported to the real-world setting (ie, the degree of fidelity of the disseminated and implemented intervention with the original study), and (3) is also concerned with the adaptation of the implemented intervention to the local context. This course provides an overview of methods for undertaking research and program evaluation within health services organizations and systems. A particular focus will be on healthcare products and how to evaluate their impact on various stakeholders whether individual patients, family, health care providers, healthcare systems or policy makers. In addition to methods, the course also provides “the state of the art” in research and evaluation through the review of major completed studies. Case studies of recent programs and technologies will be used. This course is recommended for students who will be carrying out policy research, social science research, or program impact evaluation within health delivery systems as well as developing and implementing programs to improve health care outcomes. Prerequisite: None Credit: 2.

The Pathologists' Assistant Program

Professor and Interim Chairman, Department of Pathology: David N. Howell, MD, PhD

Director, Pathologists' Assistant Program: Rex Bentley, MD

Associate Director, Pathologists' Assistant Program: Pamela Vollmer, BHS, PA (ASCP)

Medical Director, Pathologists' Assistant Program: Roger McLendon, MD

Director, Surgical Pathology: Roger McLendon, MD

Surgical Pathology Training Coordinator: Nicholas Tofolo, MHS, PA (ASCP)

Director, Autopsy Pathology: Alan Proia, MD, PhD

Autopsy Pathology Training Coordinator: Meridith Hennessey, MHS, PA (ASCP)

Chief of Pathology and Laboratory Medicine Service, Veterans Affairs Medical Center: Elizabeth Boswell, MD, PhD

Director of Surgical Pathology, Veterans Affairs Medical Center: Robin Vollmer, MD

Pathologists' Assistant Program Academic Calendar

(Master of Health Sciences and Certificate)

First Year	Fall Semester 2015	08/10/15 to 02/02/16
	Thanksgiving Break	11/25/15 to 11/29/15
	Holiday Break	12/19/15 to 01/03/16
	Spring Semester 2016	02/08/16 to 07/01/16
	Spring Break	03/26/16 to 04/03/16
	Summer Break	07/02/16 to 07/10/16
	Summer Semester 2016	07/11/16 to 09/02/16

Second year	Fall 2016	09/14/16 to 12/18/16
	Thanksgiving Break	11/21/16 to 11/29/16
	Holiday Break	12/19/16 to 01/03/17
	Spring Semester 2017	01/04/17 to 05/13/17
	Spring Break	03/26/17 to 04/03/17
	Summer Semester 2017	05/17/17 to 07/21/17

Accreditation

The curriculum, faculty, facilities, and administration of the program are accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS 5600 North River Road, Suite 720, Rosemont, IL 60018-5119, (773) 714-8880, <http://www.naacls.org>). Graduates are qualified to sit for the American Society of Clinical Pathology Board of Certification examination.

Prerequisites for Admission

1. A baccalaureate degree in a biological or chemical science from an accredited institution which includes coursework in general chemistry, organic chemistry and/ or biochemistry, biological science, mathematics, and English composition.
-or-
A baccalaureate degree in a non-science major to include the courses defined above in #1 and at least 24 course credits in biological sciences and chemistry of such depth that the admissions committee determines that the candidate has the minimum scientific background to successfully begin the study of medical sciences.
2. Scores for either the Graduate Record Examination (GRE preferred), or Medical College Admissions Test (MCAT) taken within the past five years are required. Candidates who receive their baccalaureate degree from institutions outside the United States must submit a transcript evaluation showing degree equivalency and course by course subject matter description.
3. A minimum of ten hours shadowing in anatomic pathology, specifically surgical pathology (preferably in more than one setting) and to include an autopsy if possible, or anatomic pathology laboratory work experience is required.
4. All candidates for the masters of health science degree and certification as pathologists' assistants must possess the physical and mental skills and abilities necessary to successfully complete the training program curriculum. To achieve the optimal educational experience, students are required to participate in all phases of the training program, in compliance with the Technical Standards (see below).

Technical Standards

The study of medicine is not a pure intellectual exercise. Rather, a specific set of minimal physical, mental, emotional, and social abilities are needed to be a successful student. Students must possess all of the abilities listed in the five Technical Standards categories below. The use of an intermediary that would, in effect, require a student to rely on someone else's power of observation and/or communication will not be permitted.

1. Observation
 - Visually observe materials presented in the learning environment including audiovisual presentations, written documents, microbiology cultures, microscopic examination of microorganisms, tissues and gross organs in the normal and pathologic state, and diagnostic images;
 - Observe specimens accurately and completely, both at a distance and directly. This requires functional vision, hearing, and sensation.
2. Communication
 - Effectively speak, write, hear, read, and use a keyboard utilizing the English language;
 - Perceive nonverbal communications, including facial expressions, body language, and affect;
 - Communicate effectively and sensitively with patients and their families via speech as well as reading/writing;
 - Communicate in oral and written form with the healthcare team in an effective, accurate, and efficient manner.

3. Motor

- Elicit information from surgical specimens and postmortem examinations by palpation and use of dissection instruments;
- Execute movements reasonably required to provide optimal gross analysis of surgical specimens and postmortem examinations. These skills require coordination of gross and fine motor movements, equilibrium, and sensation;
- Manipulate equipment and instruments to perform basic dissection procedures as required to attain curricular goals. (e.g., scalpel, forceps, scissors, needles and syringes, large dissection knife, band saw, camera).

4. Intellectual/Conceptual, Integrative, and Quantitative Abilities

- Perform calculations necessary to solve quantitative problems as required by the curriculum;
- Collect, organize, prioritize, analyze, and assimilate large amounts of technically detailed and complex information in a timely fashion. This information will be presented in a variety of educational settings, including lectures, small group discussions, and individual clinical settings. The applicant should be able to analyze, integrate, and apply this information appropriately for problem solving and decision-making;
- Apply knowledge and reasoning to solve problems as outlined by the curriculum;
- Comprehend the three dimensional spatial relationships of structures;
- Remain awake and alert.

5. Behavioral, Emotional, and Social Attributes

- Possess the emotional health to fully apply his/her intellectual skill, exercise good judgment, and to complete all responsibilities attendant to the diagnosis and care of surgical specimens and postmortem examinations;
- Develop a mature, sensitive, and effective relationship with patients and colleagues;
- Tolerate the physical, mental, and emotional stress experienced during training and patient care;
- Possess qualities of adaptability, flexibility, and the ability to function in the face of uncertainty;
- Form a compassionate relationship with his/her patients while maintaining appropriate boundaries for a professional relationship;
- Behave in an ethical and moral manner consistent with professional values and standards;
- Exhibit sufficient interpersonal skills, knowledge, and attitudes to interact positively and sensitively with people from all parts of society, ethnic backgrounds, and belief systems;
- Cooperate with others and work corroboratively as a team.

The faculty of the Duke University School of Medicine's Pathologists' Assistant Program recognizes its responsibility to present candidates for the MHS degree and certification that have the knowledge, attitudes, and skills to function in the specialized setting of anatomic pathology.

The Admissions Committee is responsible for adhering to these technical standards during the selection of students for the Pathologists' Assistant Program.

Application Procedures

Application forms may also be downloaded online at: <http://pathology.duke.edu/academic-programs/pathologists-assistant-program>. Application materials are also mailed to prospective candidates for admission up to December 15 of the year prior to expected August matriculation and can be obtained by writing to Pamela Vollmer, BHS, PA(ASCP)CM, Associate Director, Pathologists' Assistant Program, Department of Pathology, Box 3712, Duke University Medical Center, Durham, NC 27710, (919) 684-2159. All applications must be received by January 15 of each admissions cycle.

Applications must include

- a completed application form and a nonrefundable application fee of \$55;
- official transcripts of all colleges and universities attended;
- GRE (preferred) or MCAT scores;
- TOEFL or IELTS scores, if applicable; and
- three letters of recommendation.

Candidates will be notified of the Admission Committee's decision no later than the first week in April. Accepted candidates are required to submit a nonrefundable deposit of \$450 to retain their places in the class. This deposit will apply to the first semester tuition.

Criminal Background Checks

Candidates offered admission to the Pathologists' Assistant Program will undergo criminal background checks.

Program of Study

This is a 23.5-month program beginning with the start of the medical school academic year in August of each year. Students take most of their first year basic science courses in the School of Medicine with the medical students. It provides a broad, graduate-level background in medical sciences in support of intensive training in anatomic pathology. With the background in anatomy, histology, physiology, and microbiology, the students learn pathology at the molecular level in the classroom and are trained and given experience in the microscopic and gross morphology of disease in close, one-on-one training with pathology department faculty. They learn dissection techniques and all technical aspects of anatomic pathology in year-round clinical rotations. The curriculum is designed to produce individuals who fill the gap between the pathologist on the autopsy and surgical pathology services and other technical personnel who work in the tissue processing laboratory.

Procedure when applied experience cannot be guaranteed

The Duke School of Medicine and the Pathologists' Assistant Program will, to the best of its ability, strive to provide all clinical rotations as outlined. We reserve the right to add or deactivate specific courses or clinical affiliates as needed by program demands or the requirements of the clinical affiliate site itself. Students may not rotate through all affiliate sites, and site assignment is at the discretion of the program director.

Matriculated students are guaranteed that they will be given the opportunity to complete the entire curriculum and receive the masters of health science degree and institutional certificate of completion if the program should unexpectedly be discontinued for any reason.

Curriculum

	Course Credits
Year 1 Fall	
PATHASST 100 (Molecules, Cells and Tissues)	6
CELLBIO 701 (Human Structure and Function)	12
Term Total	18
Year 1 Spring	
PATHASST 102 (Body and Disease)	16
PATHASST 204 (Introduction to Practical Anatomic Pathology Techniques)	4
Term Total	20
Year 1 Summer	
PATHASST 210 (Introduction to Autopsy Pathology)	2
PATHASST 215 (Histology Techniques)	1
PATHASST 221 (Introduction to Surgical Pathology-Duke)	2
PATHASST 222 (Introduction to Surgical Pathology-VAMC)	2
Term Total	7
Year 2 Fall	
PATHASST 217 (Special Diagnostic Techniques)	1
PATHASST 321 (Surgical Pathology I -Duke)	4
PATHASST 322 (Surgical Pathology I -VAMC)	4
PATHASST 340 (Photography I)	1
PATHASST 323 (Autopsy Pathology I)	4
PATHASST 361 (Pathologic Basis of Clinical Medicine I)	3
PATHASST 359 (Laboratory Technologies and Management)	2
Term Total	19
Year 2 Spring	
PATHASST 331 (Surgical Pathology II -Duke Site)	7
PATHASST 332 (Surgical Pathology II -VAMC Site)	4
PATHASST 302 (Forensic Pathology)	2
PATHASST 324 (Autopsy Pathology II)	4
PATHASST 341 (Photography II)	2
PATHASST 362 (Pathologic Basis of Clinical Medicine II)	3
Term Total	22
Academic Degree Awarded	86
Year 2 Summer	
PATHASST 330 (Autopsy Practicum)	3
PATHASST 351 (Surgical Pathology Practicum-Duke)	2
PATHASST 352 (Surgical Pathology Practicum-VAMC)	2
PATHASST 390 (Senior Seminar)	2
Term Total	9
CERTIFICATE AWARDED	95

Attendance and Excused Absences

Students are required to attend all mandatory events, which may include lectures, laboratories, seminars, and clinical assignments. Absences are excused only for illness or personal emergency, and students must notify course coordinators and program faculty in advance of an expected absence. Absences of one to two days duration for professional purposes during the second year are allowed with the approval of the program director, and individual clinical rotation coordinators.

Registration and Drop/Add Policy

Registration in the Pathologist's Assistant Program is offered on a full-time basis only and part-time enrollment is not allowed. All required course registrations are processed in the Office of the Registrar for the School of Medicine. As the program is only offered full-time, and all courses are mandatory, dropping and adding courses is not permitted. Transfer of students from other programs is not permitted.

Program Policies and Grading Standards

Grades for courses and clinical rotations in the pathologists' assistant curriculum are assigned on the basis of the following: H (honors), P (pass), L (low pass), and F (fail). Exceptions are PATHASST 100 (Molecules, Cells and Tissues), CELLBIO 701 (Human Structure and Function), PATHASST 102 (Body and Disease), PATHASST 361-362 (Pathologic Basis of Clinical Medicine), and PATHASST 390 (Senior Seminar) which are graded as either P (pass) or F (fail) and PATHASST 222 (Introduction to Surgical Pathology-VAMC) which is graded as P (pass), L (low pass), and F (fail). Honors in any didactic course is defined as an overall average score of 90 percent and an overall average score of less than 70 percent constitutes failure.

Grades for courses and rotations are H (honors), P (pass), LP (low pass), F (fail), and I (incomplete). The determination of what performance equates with what grade is up to the individual instructor and course although for written examination a minimum of 70 percent is usually required to pass. Two grades of LP results in academic probation, and will require the student to complete remediation before progression to the next semester's courses. A single grade of F can result in dismissal from the program.

Many rotations and courses also use subjective means of evaluation such as direct observation of the student's work, student participation, and evaluation of written materials. In all rotations evaluations of performance are written and grades are derived from these evaluations.

The program is designed to integrate classroom and clinical learning experiences considered necessary for competency as health care providers and each course in the curriculum is required. Therefore, the failure of any course in which the student is unable to successfully remediate will ultimately result in withdrawal from the program. Determination of satisfactory academic progress is made by the program director upon advisement of the program advisory committee.

The advisory committee will evaluate all student deficiencies and will invite the student to a hearing. The student has the option of including a faculty member or fellow student in the hearing. The decision made by the advisory committee is sent to the program director, who will evaluate and accept, reject or modify the recommendations from the committee. The student has the benefit of appeal to the dean of the School of Medicine. An appeal to the dean may only be made on the grounds of improper procedures in the appeals process rather than continued disagreement regarding the outcome of the process. The dean will review the data related to the process of the appeal and determine whether the process was valid. If the process is found to be valid, the decision is final and binding. If the process is found to be invalid, a new review panel will be convened.

Students in the Pathologists' Assistant Program are participants in a professional training program whose graduates assume positions of high responsibility as health care providers. Students are therefore evaluated not only on their academic performance and technical skills, but on their professional conduct. These evaluations will be in a written form as part of the general clinical rotation summaries. Deficiencies in professional conduct may result in academic; repeated episodes or patterns of misconduct may result in suspension or dismissal from the program. The Office of the Registrar in the School of Medicine will be notified of the student's status of academic probation or suspension and the status will be noted on the student's transcript at the completion of the semester(s) during which the status is assigned. If the student successfully returns to good academic standing from academic probation, the statement will be removed; if the student is suspended, however, the statement will remain permanently on the transcript.

Remediation

Students who initially receive a failing grade in any course must undergo a remediation process as defined by the individual course instructor and approved by the program director. Successful remediation will result in the student receiving a P (pass). Unsuccessful remediation will result in academic probation, with additional remediation and academic counseling required. If these additional steps are unsuccessful, failure will result and the student will be withdrawn from the program.

Appeals of Course Grades

A student may appeal a course grade by writing the course coordinator and program director, providing factual evidence for changing the final course grade. Appeals will be considered individually on their merits and will not be considered precedent. The program director will notify the student in writing of the appeal decision within three weeks of the appeal.

Satisfactory Academic Progress

Satisfactory academic progress consists of the receipt of a passing grade in all didactic and practical courses and is defined as follows:

- **Year One:** Completion of all required courses and rotations (a total of 47 course credits) during the fall, spring, and summer within the scheduled semester.
- **Year Two:** Completion of all clinical rotations, courses, and a senior seminar during the fall, spring and summer rotations (a total of 48 course credits) within the scheduled semester.

In unusual circumstances (illness or academic remediation) the determination of satisfactory progress is made by the program director.

Appeals of Academic Status (Academic Probation or Withdrawal)

A student placed on academic probation or withdrawal from the program may appeal by indicating in writing to the program director reasons why he/she did not achieve minimum academic standards and factual evidence for changing the academic standing. Appeals will be considered individually on their merits and will not be considered as precedent. The program director will notify the student of the decision of the appeal in writing within three weeks of receipt of the appeal.

Leave of Absence

A pathologists' assistant student, after presenting a written request to the program director, may be granted an official leave of absence for personal, medical, or academic reasons for a period not to exceed one calendar year. If the leave of absence is approved, the program director provides written notification including applicable beginning and ending dates to the student, the medical school registrar and the director of financial aid. The student must notify the program director in writing of his or her wish to return to the program at least sixty calendar days prior to the stated date of re-entry. When a leave of absence is taken, the program director may require the student to repeat some or all of the courses completed prior to the leave of absence. In all cases of leave of absence, the student is required to complete the entire curriculum to be eligible to earn the masters of health science degree and the pathologists' assistant institutional certificate.

Return From Leave of absence

Returning students who must complete degree requirements off-schedule from their entering cohort are required to meet all degree requirements as established at time of program completion for the cohort to which the student is joined. Following are general guidelines for return from leave of absence; individual situations may be addressed in a more detailed manner at the discretion of the program administration. For students who have withdrawn after the sixth week of a semester, tuition will be waived for the equivalent term when the student returns. For students who withdrew from the first to the sixth week, tuition will be charged according to the schedule below. The student is responsible for all other University/program fees for the returning term regardless of the timing of the withdrawal. Students completing off-schedule should contact the Office of Financial Aid regarding continued eligibility for federal education loans.

Withdrawal

If a student withdraws, including involuntary withdrawal for academic reasons, tuition is refunded according to the following schedule:

Before classes begin:	Full amount
During first or second week:	80%
During third to fifth week:	60%
During sixth week:	20%
After sixth week:	none
Student fees are nonrefundable after classes begin.	

Historically, voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. Per letter, the program director will notify the offices of the registrar and financial aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure the student has fulfilled all responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date.

Code of Professional Conduct

Students enrolled in the Duke Pathologists' Assistant Program are expected to adhere to the Duke University School of Medicine Code of Professional conduct as detailed in the policies for all School of Medicine programs found elsewhere in this bulletin.

The study of medicine is not a pure intellectual exercise. Rather, a specific set of minimal physical, mental, emotional, and social abilities are needed to be a successful student. Students must possess all of the abilities listed in the five "[Technical Standards](#)". The use of an intermediary that would, in effect, require a student to rely on someone else's power of observation and/or communication will not be permitted.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided. The student health fee is mandatory for all students.

Technology Fee

All matriculating students in the program will be assessed a mandatory technology fee. The fee will not only cover hardware such as laptop and other devices as deemed appropriate for the program, but service, software, and technical updates to comply to all Duke Health System compliance guidelines.

Tuition and Fees

2015-2016

1st year - \$31,836

2nd year - \$31,796

Full cost of attendance budgets may be found on the Office of Financial Aid website: <https://medschool.duke.edu/education/student-services/office-financial-aid> (refunds).

Degree Requirements

Passage of 86 course credits of graduate coursework is required for the MHS degree. An additional 9 course credits earned during the final summer are required to receive a certificate at the end of the program. There is a mandatory, comprehensive, oral seminar presentation reviewed by a panel of pathology department faculty and staff which all students must pass for successful completion of the program.

Commencement and Certificate Award

The Pathologists' Assistant student must successfully complete 86 course credits, including all scheduled courses and clinical rotations, in order to receive the masters of health science degree at the general university commencement ceremonies held in May. In order to receive institutional certification of completion and be eligible to sit for the American Society of Clinical Pathology (ASCP) Board of Certification Examination, an additional 9 course credits (for an overall total of 95 course credits), to include the remaining autopsy and surgical pathology practical rotations, and the Senior Seminar must be completed two months later by the end of July. Granting of the degree and certificate is not contingent upon the students passing any type of external certification or licensure examination.

Courses of Instruction

PATHASST-100. Molecules, Cells and Tissue. A course designed for first year pathology assistant students with a focus on the molecular and cellular principles of human disease. The course has four components, which are tightly integrated: biochemistry, cell biology, genetics, and a series of clinical correlations. The biochemistry component re-emphasizes the relationship between structure and function of the major classes of macromolecules in living systems including proteins, carbohydrates, lipids, and nucleic acids. The metabolic interrelationships and control mechanisms are discussed as well as the biochemical basis of human diseases. The cell biology component emphasizes the structure and function of the cells and tissues of the body. The laboratory provides practical experience with light microscopy studying and analyzing the extensive slide collection of mammalian tissues. The genetics component emphasizes molecular aspects of the human genome, the structure of complex genes, regulation of gene expression, experimental systems for genetic analysis, human genetics -- including population genetics and genetic epidemiology, the use of genetic analysis for the identification of disease causing genes, cytogenetics, cancer genetics, and genetic diagnosis and counseling. The series of clinical correlations links the material covered in the basic science lectures to clinical problems. Many of the correlations include an interview with a patient. Also included are a day symposium on nutrition and a day symposium on aging. Credit: 6. McIntosh, Brennan, Carbrey, Cohn, and staff

CELLBIO-701. Human Structure and Function. Core course of preclinical curriculum presents scientific principles underlying structure and function of the normal body. Focuses on gross anatomy, microscopic anatomy, and physiology of nine organ systems providing the foundation for the practice of medicine. Registration of non-Pathologists' Assistant students requires permission of Course Director. Credit: 12. Jakoi

PATHASST-102. Body and Disease. This core course is presented from February through June of the first year. The course begins with fundamental principles of the three basic sciences most directly related to human disease: immunology, microbiology, and pathology. This component is followed by an integrated presentation of the most common human diseases organized sequentially by organ system. Teaching modes include lectures, a variety of small group activities guided by faculty and clinically-oriented disease workshops. Credit: 16. Nadler, Aballay, Hulette, Keene, Kelsoe, and Yee

PATHASST-204. Introduction to Practical Anatomic Pathology Techniques. Students are introduced to autopsy pathology and the daily activities of a busy autopsy service, and to the daily activities in a surgical pathology laboratory. Emphasis is placed on neurologic gross and microscopic anatomy and dissection of the brain and spinal cord. Students become acquainted with the various duties assumed by trained Pathologists' Assistants and are introduced to basic tissue dissection techniques taught through participation in the surgical pathology service. Lectures in basic medical terminology are presented with emphasis on pathologic processes. Students are also exposed to educational methodologies in lecture and laboratory settings, medical ethics and professionalism and basic laboratory safety. Credit: 4. P. Vollmer, Hulette, Boland and staff

PATHASST-210. Introduction to Autopsy Pathology. This is a summer rotation given during the first summer session. It is designed to acquaint the student with autopsy prosection and workup training and experience, building on concepts introduced in PATHASST 204. Students work with the PA on service and assist residents in full autopsy dissections. Credit: 2. Boland, DiBernardo, Hennessey and staff

PATHASST-215. Histology Techniques. Students participate in rotations through two histology and immunohistochemistry laboratories. The rotations are designed to acquaint students with the various laboratory techniques used in tissue processing, routine histology, special histochemistry and immunohistochemistry procedures. Credit: 1. Terrell

PATHASST-217. Special Diagnostic Techniques. Students are introduced to ancillary diagnostic technologies and techniques used to assess cellular and subcellular pathology, to include immunohistochemistry, flow cytometry, molecular diagnostic studies and electron microscopy in various laboratory settings. Credit: 1. Perkinson and staff.

PATHASST-221. Introduction to Surgical Pathology-Duke. This is the initial practical rotation conducted during the first summer session. It is designed to acquaint students with the techniques of gross dissection, descriptions, and submission of tissue samples from surgical specimens, focusing on small biopsy specimens and building on concepts presented in PATHASST 204. It runs concurrently with PATHASST 222, and is designed to introduce students to the variations and differences between a university medical center and a veterans administration medical center's Surgical Pathology Service. Credit: 2. Tofolo and staff

PATHASST-222. Introduction to Surgical Pathology-VAMC. This is the initial practical rotation conducted during the first summer session complimenting PATHASST 221. It presents students with the techniques of gross dissection, descriptions, and submission of tissue samples from surgical specimens processed at the Durham Veterans Administration Medical Center's (VAMC) Surgical Pathology Service. Emphasis is placed on the close interaction with the attending pathologist, pathology resident and their interactions with the surgical team. Students are introduced to tissue triage, slide preparation, frozen section technique and case sign-out logistics, comparing the variations and differences between a university medical center and a veterans administration medical center's Surgical Pathology Services. Credit: 2. Lark and staff

PATHASST-302. Forensic Pathology. This is a practical rotation at the North Carolina Office of the Chief Medical Examiner observing and participating (on a limited basis) with forensic pathologists performing medical-legal autopsies. Credit: 2. Radisch and staff

PATHASST-321 (DUKE), 322 (VAMC). Surgical Pathology I. These courses run concurrently during the fall semester of the second year, and are meant to be complimentary. They are practical rotations on the Duke University and Veterans Administration Medical Center's Surgical Pathology Services respectively, building on the techniques and skills taught in PATHASST 221 & 222. These courses consist of continuing laboratory training in the orientation, description, and dissection of gross surgical specimens with special emphasis on frozen section technique, tissue triage and the role of the PA and their interaction with the attending pathologist and pathology resident following many of the cases through to sign-out by the pathologist at the VAMC. Credit: 4, 4. Tofolo, Lark and staff

PATHASST-323, 324. Autopsy Pathology I, II. A detailed consideration of the morphologic, physiologic, and biochemical manifestations of disease. Includes gross dissection, histologic examinations, processing, and analyzing of all autopsy findings under tutorial supervision. Credit: 4, 4. Boland, DiBernardo, Hennessey and staff

PATHASST-331 (DUKE), 332 (VAMC). Surgical Pathology II. These courses run concurrently during the spring semester of the second year, and are meant to be complimentary. They are continuing, practical rotations on the Duke University or Veterans Administration Medical Center's Surgical Pathology Services, building on the techniques and skills taught in PATHASST 221, 222, 321 & 322. These courses consist of continuing laboratory training in the orientation, description, and dissection of gross surgical specimens with special emphasis on the role of the PA and their interaction with the attending pathologist and pathology resident, following many of the cases through to sign-out by the pathologist at the VAMC. Students also participate in a two week enrichment experience at an external rotation site during these courses. Credit: 7, 4. Tofolo, Lark and staff

PATHASST-340, 341. Photography I, II. This is an introduction to medical photography. Students become familiar with photography equipment and the fundamentals of gross and microscopic specimen photography. Credit: 1, 2. Conlon

PATHASST-330. Autopsy Practicum. This is the final autopsy rotation completed during the summer of the second year of training. Students must perfect their dissection skills, demonstrate the ability to conduct full autopsy prosecutions in all possible situations, and write full preliminary autopsy reports. In addition, special dissection skills are taught in this course. Credit: 3. Boland, DiBernardo, Hennessey and staff

PATHASST 351 (Duke), 352 (VAMC). Surgical Pathology Practicum-Duke and VAMC. These are the final surgical pathology rotations completed during the summer of the second year of training both at Duke University and the Veterans Administration Medical Center. Students must perfect their dissection skills and demonstrate the ability to orient, dissect, describe, and submit appropriate tissue samples from all commonly encountered surgical pathology specimens. Students also participate in a one week enrichment experience at an external rotation site during these courses. Credit: 2, 2. Tofolo, Lark and staff

PATHASST-359. Laboratory Technologies and Management. Students are presented with fundamentals of laboratory management to include regulatory and compliance issues, basic management techniques, laboratory safety and infection control in both lectures and practical applications, as well as practical applications of fine needle aspiration and bone marrow aspiration and biopsy. Credit: 2. Department of Pathology faculty and staff.

PATHASST361, 362. Pathologic Basis of Clinical Medicine I, II. This course consists of lectures and seminars by the departments of Pathology and Medicine faculty emphasizing both basic science and systemic pathologic topics. Credit: 3, 3. Department of Pathology and Medicine faculty.

PATHASST-390. Senior Seminar. Students complete an independent study under the supervision of a Department of Pathology faculty member or senior Pathology resident. Topics are selected from Surgical Pathology or Autopsy Pathology cases, and are researched, developed and presented to the PA Program administration and the Department of Pathology faculty and staff as a final senior seminar. Credit: 2. Bentley and staff.

The Physician Assistant Program

Department of Community and Family Medicine

Department Chairman: J. Lloyd Michener, MD

PA Division Chief: Patricia M. Dieter, MPA, PA-C

Medical Director: Margaret Gradison, MD, MHS-CL

Program Director: Karen Hills, MS, PA-C

Associate Director: Sherrie Spear, MHS, PA-C

Director Preclinical Education: Annamarie Streilein, MHS, PA-C

Academic Coordinator: Betsy Q. Melcher, MS, ATC, MHS, PA-C

Academic Coordinator: Melvania Briggs, MA, PA-C

Clinical Coordinator: Melinda Blazer, MHS, PA-C

Clinical Coordinator: Nicholas M. Hudak, MEd, MPA, NCC, PA-C

Director Clinical Education: April Stouder, MHS, PA-C

Assistant Professor: Peggy R. Robinson, MS, MHS., PA-C

Director Diversity and Inclusion: Lovest T. Alexander, MHS, PA-C

Director of Research: Perri Morgan, PhD, PA-C

Assistant Professor: Christine Everett, PhD, MPH, PA-C

Surgical Coordinator: Paul C. Hendrix, MHS, PA-C

Pharmacology Coordinator: Jean Mesaros, PharmD

Anatomy Coordinator: Megan Holmes, PhD

The physician assistant (PA) concept originated at Duke in 1965. Dr. Eugene A. Stead Jr., then chairman of the Department of Medicine, believed that mid-level practitioners could increase consumer access to health services by extending the time and skills of the physician. Today, physician assistants are well-recognized and highly sought-after members of the health care team. Working interdependently with physicians, PAs provide diagnostic and therapeutic patient care in virtually all medical specialties and settings. They take patient histories, perform physical examinations, order laboratory and diagnostic studies, and develop patient treatment plans. In all fifty states, PAs have the authority to write prescriptions. Their job descriptions are as diverse as those of their supervising physicians, and also may include patient education, medical education, health administration, and research.

PAs practice in all specialty fields; 29 percent of all PAs provide primary care services, especially in family and general internal medicine. While PAs remain dependent in that they provide medical services with the supervision of physicians, other nonphysician tasks have been integrated into the role, particularly in the institutional and larger clinic setting. While not always clinical in nature, these tasks are essential to the practice of the PA's supervising physician. For example, PAs in the tertiary care setting are often involved in the acquisition, recording and analysis of research data, the development of patient and public education programs, and the administration of their departments' clinical and educational services. Involvement in these other services has provided job advancement for PAs in these settings.

Additional nonclinical positions are developing for PAs. While these positions do not involve patient care, they depend on a strong clinical knowledge base. The MHS curriculum provides PAs with depth of knowledge in the basic medical sciences and clinical medicine, as well as skills in administration and research. With these expanded skills, graduates can take advantage of the wide diversity of positions available to PAs.

Physician Assistant Program Preclinical Year Calendar

Duke University Physician Assistant Program

Preclinical Year Calendar – Academic Year 2015-2016 (Class of 2017)

Fall 2015

August 17	Monday, 9 a.m.—Orientation Week (8/17-8/21) begins
August 19	Wednesday—Fall Semester classes begin; Convocation
September 7	Monday—Labor Day Holiday, no classes
October 13	Tuesday, 5 p.m.—Begin Fall Break
October 19	Monday, 8 a.m.—Classes resume
November 24	Tuesday, 5 p.m.—Begin Thanksgiving Holiday
November 30	Monday, 8 a.m.—Classes resume
December 18	Friday, 5 p.m.—End of Fall Semester; Winter Break begins

Spring 2016

January 4	Monday, 8 a.m.—Spring Semester classes begin
January 18	Monday—Martin Luther King, Jr. Holiday—no classes
February 12	Friday, 5 p.m.—Begin Spring Break
February 22	Monday, 8 a.m.—Classes resume
April 13	Wednesday, 5 p.m.—End of Spring Semester; Semester Break begins

Summer 2016

April 18	Monday, 8 a.m.—Summer Term classes begin
May 12	Thursday, 5 p.m.—End classes for AAPA Conference
May 23	Monday, 8 a.m.—Classes resume
June 17	Friday, 5 p.m.—End of Summer Term and Preclinical Year

Clinical Year Calendar – Academic Year 2015-2016 (Class of 2016)

June 19	End of classes	
June 20-July 10	Summer Break	
July 13-24	Physician Assistant Program 299 Bridge: The Path to Patient Care	
July 27-August 21	Rotation #1	
August 24-September 18	Rotation #2	Labor Day holiday, September 7 Call Back Day #1, September 18
September 21-October 16	Rotation #3	
October 19-November 13	Rotation #4	
November 16-December 11	Rotation #5	Thanksgiving Holiday, November 26 Call Back Day #2, December 11
December 12, 2015-January 2, 2016	Winter Break	
January 4-29	Rotation #6	Martin Luther King, Jr. Holiday, January 18
February 1-26	Rotation #7	Call Back Day #3 & #4, February 25 & 26
February 29-March 25	Rotation #8	
March 28-April 22	Rotation #9	Call Back Day #5 & #6, April 21 & 22
April 23-May 1	Spring Break	
May 2-May 27	Rotation #10	Graduation, Sunday, May 15 PA Holiday: 5 p.m. Friday, May 13-May 15 Memorial Day Holiday, May 30
May 31-June 24	Rotation #11	Call Back Day #7, June 24
June 27-July 22	Rotation #12	Independence Day Holiday, July 4
July 25-August 5	Senior Seminar	Certificate of Completion, August 5
August 7	Certificate of Completion	
August 12	Eligible to sit for PANCE	

Prerequisites for Application

The prerequisites for application to the MHS physician assistant curriculum include:

1. A baccalaureate degree from an accredited institution. College seniors are eligible to apply, provided they receive the baccalaureate degree prior to the August starting date for the PA Program. Those candidates who received their baccalaureate degrees from colleges and institutions outside of the United States must complete at least one year (thirty semester credits) of additional undergraduate or graduate study at an accredited US college or university prior to application to the program.
2. Specific prerequisite college courses:
 - At least five biological science courses of three semester credits or four quarter credits each are required. Of these five courses, at least one must be in anatomy, one in physiology, and one in microbiology. Courses in human anatomy and human physiology are preferred to courses of a more general nature, and courses with labs are preferred. To fulfill the remaining biological science course prerequisite, the PA Program recommends courses in cell biology, molecular biology, genetics, embryology, histology, or immunology. While none of the latter courses are required, they provide a good foundation for the study of medicine.
 - At least two chemistry courses with labs are required. Each of these courses must be at least four semester credits or five quarter credits each.
 - At least one statistics course of at least two semester credits or three quarter credits is required.
 - All prerequisite courses must be completed with grades of C or better (not C minus).
3. Scores of the Graduate Record Examination (GRE general test), taken within the last four years, and no later than October 1 of the year of application. No other test scores are accepted in lieu of the GRE.
4. A minimum of 1,000 hours of patient care experience, with direct “hands-on” patient contact, completed by October 1 of the year of application.

Application Procedures

Duke's PA Program is a participant in CASPA (Centralized Application Service for PAs). The CASPA application may be accessed via the program's website <http://paprogram.mc.duke.edu/>. The application is available from April 22 to October 1. In addition to completing and submitting the web-based application by October 1, candidates must also submit

- the CASPA application fee;
- official transcripts from all colleges/universities and other post-secondary institutions attended;
- scores of the GRE. The GRE must be taken no later than October 1;
- three completed recommendation forms, including at least one from a health care provider with whom the applicant has worked; and
- the online supplemental application (access provided to the applicant after submission of CASPA application) must be submitted by November 1.

Selection Factors

The Duke PA Program is a mission driven program that recruits caring individuals who are dedicated to providing competent health care. We value applicants who demonstrate a heart for service and a commitment to increasing access to health care. The PA Program is committed to attracting students from geographically underserved regions such as Area Health Education Centers (AHEC) in North Carolina, as well as students from different racial, ethnic, and socioeconomic backgrounds. The PA program also values diversity in other forms, such as age, gender, gender identity, disability, and years of experience in the health care field. Information submitted by each applicant is carefully reviewed by the Committee on Admissions, and selected applicants are invited to Duke University for personal interviews. These interviews take place in October through January; eighty-eight students are chosen from among those interviewed. Only full-time students are admitted.

Candidates are notified of the Admission Committee's decision as soon as possible after the interview, and no later than mid-February. Those candidates who have been accepted are asked to respond in writing with their decision and to confirm their place in the class by submitting the nonrefundable registration and deposit fees by the requested date. Each year, a ranked alternate list of candidates is selected from those candidates who have been interviewed for a position in the class. Should an accepted candidate withdraw from the program prior to the start of classes, the position is offered to the highest-ranked candidate on the alternate list.

Criminal Background Check and Drug Screening

Candidates offered admission to the Physician Assistant Program will undergo a criminal background checks and drug screening following admission, again prior to clinical rotations, and as needed for clinical sites.

Program of Study

The curriculum is twenty-four consecutive months in duration and is designed to provide an understanding of the rationale for skills used in patient assessment, diagnosis, and management. The first twelve months of the program are devoted to preclinical studies in the basic medical and behavioral sciences, and the remaining twelve months to clinical experiences in primary care, medical and surgical specialties, and advanced study in evidence-based medicine.

Each student is assessed a technology fee for both the first and second years. As part of the technology fee, the program provides computers and mobile handheld devices which are used for a variety of in-class and clinical assignments and activities, as well as communication.

The preclinical curriculum is integrated to introduce the student to medical sciences as they relate to specific organ systems and clinical problems. Learning strategies include the traditional lecture format and basic science laboratory, small group tutorials, and patient case discussions. Regular patient contact is an important part of the first-year curriculum. Students begin to see patients during the fall semester as part of the Patient Assessment and Counseling course; this patient contact continues through the spring and summer terms of the preclinical year. Standardized patient evaluations, using simulators and actors, are also a part of the preclinical curriculum.

As part of the clinical curriculum, students are required to complete rotations in internal medicine, surgery, emergency medicine, primary care, pediatrics, obstetrics/gynecology, and behavioral medicine. In addition, two elective clinical rotations are included in the clinical year schedule, as is a rotation devoted to advanced study in evidence-based medicine. At least one clinical rotation must be completed in a medically underserved site. The final weeks of the clinical year are spent in a senior seminar which includes intensive preparation for the PA National Certifying Examination (PANCE).

Because the clinical teaching is carried out in many practice settings throughout North Carolina, students should plan on being able to travel away from the Durham area for many of their clinical experiences. Housing will be made available for out-of-town clinical rotations.

Curriculum

Before proceeding into the clinical phase of the curriculum, students must satisfactorily complete the following:

Preclinical Year

Fall Semester

PHYASST 200 (Basic Medical Sciences)	2 course credits
PHYASST 201 (Physiology)	2 course credits
PHYASST 203 (Introduction to Prevention & Population Health)	1 course credit
PHYASST 205 (Anatomy)	4 course credits
PHYASST 210 (Diagnostic Methods I)	3 course credits
PHYASST 220 (Clinical Medicine I)	5 course credits
PHYASST 223 (Pharmacology and Therapeutics I)	1 course credit
PHYASST 231 (Patient Assessment and Counseling I)	3 course credits
PHYASST 251 (Practice and the Health System I)	1 course credit
Term Total	22 course credits

Spring Semester

PHYASST 255 (Evidence-based Medicine I)	2 course credits
PHYASST 211 (Diagnostic Methods II)	2 course credits
PHYASST 221 (Clinical Medicine II)	10 course credits
PHYASST 224 (Pharmacology and Therapeutics II)	1 course credit
PHYASST 230 (Fundamentals of Surgery)	3 course credits
PHYASST 232 (Patient Assessment and Counseling II)	3 course credits
Term Total	21 course credits

Summer Term	
PHYASST 212 (Diagnostic Methods III)	1 course credit
PHYASST 222 (Clinical Medicine III)	10 course credits
PHYASST 225 (Pharmacology and Therapeutics III)	1 course credit
PHYASST 236 (Patient Assessment and Counseling III)	3 course credits
Term Total	15 course credits
Preclinical Year Total	58 course credits

Clinical Year

Following successful completion of the preclinical courses, students enter the clinical phase of the program, completing the following experiences:

PHYASST 299 (Bridge: The Path to Patient Care)	2 course credits
PHYASST 300A, 300B (Primary Care)	4 course credits; 4 course credits
PHYASST 305 (Evidence-based Medicine II)	3 course credits
PHYASST 310 (Behavioral Medicine)	4 course credits
PHYASST 320A, 320B (Internal Medicine)	4 course credits; 4 course credits
PHYASST 340 (General Surgery)	4 course credits
PHYASST 350 (Emergency Medicine)	4 course credits
PHYASST 360 (Pediatrics)	4 course credits
PHYASST 370 (Obstetrics/Gynecology)	4 course credits
Elective	4 course credits
Elective	4 course credits
PHYASST 390 (Senior Seminar)	2 course credits
Total	51 course credits

In addition to successful completion of the preclinical and clinical phases of the program, the PA student must also successfully complete BLS, ACLS, and all components of summative evaluation to graduate from the PA Program.

Attendance and Excused Absences

Students are expected to attend all lectures, laboratories, seminars, and small group sessions as they are designed to develop professional and clinical skills. Lectures are typically recorded, so students usually have the option to review the lecture if missed due to illness, medical or dental appointments, personal or family emergencies. Small group teaching experiences such as physical diagnosis practicums, anatomy and surgery labs and seminars, Common Problem Labs, Synthesis Sessions, standardized and actual patient encounters are rich learning opportunities for students that cannot be recreated. Because of the unique nature of group learning activities, these are considered as mandatory sessions unless illness or emergency situations arise. As such, the student should notify the course coordinator and their advisor in advance of the missed group learning session. Attendance in the clinical year is mandatory, as outlined in the Clinical Year Attendance Policy.

Registration and Drop/Add Policy

All courses are required and are offered as a cohort. There is no opportunity to drop or add a course.

Program Policies and Grading Standards

Grades for all courses and clinical rotations in the Physician Assistant curriculum are assigned on the basis of the following: H (honors), P (pass), and F (fail). The Physician Assistant Program is designed to integrate classroom and clinical learning experiences considered necessary for competency as health care providers. Therefore, the failure of

any required course will result in dismissal from the program. Determination of satisfactory academic progress is made by the PA program director upon advisement by the progress and promotions committee, at the conclusion of each semester/term.

A grade of I (incomplete) may remain on a student's transcript for one year only. After one year, a grade of Incomplete automatically is converted to an F. An extension to this one-year limit may be granted by the program director; a request must be submitted in writing to the program director no later than thirty days prior to the expiration of the one-year time limit.

Students in the Physician Assistant Program are participants in a professional training program whose graduates assume positions of high responsibility as providers of health care. Accordingly, students are evaluated not only on their academic and clinical skills, but also on their interpersonal skills, reliability, and professional conduct. Deficiencies in any of these areas are brought to the student's attention in the form of a written evaluation and may result in probation, suspension, or expulsion from the program.

Appeals of Course Grades

A student may appeal a course grade by writing to the program director, providing factual evidence for changing the final course grade. Appeals will be considered individually on their merits and will not be considered as precedent. The program director will notify the student of the decision on the appeal in writing, within two weeks of receipt of the appeal.

Satisfactory Academic Progress

Determination of satisfactory academic progress is made by the PA program director upon advisement by the progress and promotions committee, at the conclusion of each semester/term. Satisfactory academic progress for students in the Physician Assistant Program consists of the successful completion of all requirements necessary for the advancement from one semester to the next. These requirements are as follows:

Preclinical Year: Completion of all required courses (a total of 58 course credits) during the fall, spring, and summer terms within the scheduled semester or term and within one year of initial matriculation.

Clinical Year: Completion of all required core rotations, elective rotations, and a senior seminar (a total of 51 course credits) during the fall, spring, and summer terms; rotations begin in the semester immediately following the completion of the preclinical year and must proceed as scheduled without interruption for three semesters/terms (twelve months).

In unusual circumstances (including leave of absence, academic remediation, or probationary status) the determination of satisfactory progress for academic purposes is made by the program director of the Physician Assistant Program in conjunction with the Progress and Promotion Committee. This may extend the rotational cycle within the calendar year of intended graduation.

For financial aid purposes, federal regulations establish the maximum time frame for completion of the program at 150 percent of the minimum time required to complete the program. Any student exceeding the 150 percent maximum time frame is ineligible for Title IV (Stafford loan) student financial aid funds.

Determination of Academic Standing

All students' records are reviewed at the end of each term by the Progress and Promotions Committee, and each student is assigned to one of the following categories of academic standing:

- **Satisfactory Academic Standing:** The PA student is considered to have satisfactory academic standing if he/she completes no more than one course in a semester or term with an overall grade of less than 78 (but greater than or equal to 70).
 - Frequent examination failure and subsequent need for remediation negatively impacts the student's clinical knowledge foundation. If a student incurs three (3) or more exam failures (grade of 70 or less) in the fall or spring semesters of the preclinical year, two (2) or more in the preclinical summer semester, or three (3) or more end of rotation exams in the clinical year, this will then precipitate a formal letter outlining academic deficiencies to be placed in the student's DPAP file. This will generate a rigorous review of the student's academic performance and professional behavior during the respective semester's Progress and Promotion Committee meeting. This committee will determine whether a student should be recommended for academic probation, placed on a behavioral learning contract, or required to meet more fre-

quently with their faculty advisor for academic counseling sessions (duration to be determined based upon student's academic improvement).

- **Academic Probation:** The PA student is considered to be on academic probation if he/she completes more than one course in a semester with an overall grade of less than 78 (but greater than or equal to 70). Additionally, the following are considered academic issues and may result in the assignment of Academic Probation: deficiencies in clinical skills, interpersonal communication abilities, and/or professional conduct, failure of a complete integrated unit (i.e., failure of the clinical medicine, pharmacology, and diagnostic methods portions of the same exam), or as recommended by the Progress and Promotion Committee upon review of the student with multiple examination failures.
 - Academic probation indicates concern about the student's performance in the curriculum. If the Progress and Promotions Committee recommends academic probation, the vice dean for education is notified and provided with relevant material justifying the recommendation. The student is informed that future performance must improve or the student risks dismissal from the program. In any future semester, if a student previously assigned to probation completes more than one course with an overall grade of less than 78, the student will be dismissed from the program. Any overall course grade of F (less than 70), earned at any point in the program, requires that the student be dismissed from the program. Once a student is placed on probation a continued pattern of misconduct, deficiencies in clinical skills, poor interpersonal communication, or unprofessional conduct could also result in the student's dismissal from the PA Program.

The vice dean for education is responsible for placing individuals on academic probation, suspension, or dismissal upon a finding of unsatisfactory academic performance. Appeals of sanctions by the vice dean for education are made to the Academic Appeals Committee (AAC). A summary report, the student's rationale for the appeal, and all relevant documents are supplied to the AAC by the vice dean for education.

Students on academic probation or on a Behavioral Learning Contract are less likely to be considered for special clinical experiences such as Global Health Electives, out-of-state rotations, or independent studies.

The medical center registrar will be notified of the student's status of Academic Probation and the status will be noted on the student's transcript at the completion of the semester(s) during which this status is assigned. Also, students should be aware that they may be required to report academic probation when seeking medical licensure and/or credentialing.

Appeals of Academic Status (Academic Probation or Dismissal)

- A student placed on academic probation or dismissed from the program may appeal to the Academic Appeals Committee (AAC) within 10 business days of official notification of academic status. A summary report, the student's rationale for the appeal, and all relevant documents are supplied to the AAC by the vice dean for education. The student will have 10 business days after notification of the outcome of the appeal to submit a request to have the dean of the School of Medicine review the appeals process. An appeal to the dean may be made only upon the grounds of improper procedures in the process rather than continued disagreement about the outcome of the process. The dean will review the information related to the process of the appeal and determine whether it was appropriate. The dean can uphold the committee's decision, recommend another sanction, recommend no sanction, or send the matter back to the committee for further consideration.
- Once the dean of the School of Medicine upholds a decision of dismissal, the student relinquishes student status and is no longer enrolled in the University.

Leave of Absence

A PA student, after presenting a written request to the PA program director, may be granted an official leave of absence for personal, medical, or academic reasons for a period not to exceed one calendar year. If the leave of absence is approved, the program director provides written notification including applicable beginning and ending dates to the student, the medical school registrar, and the director of financial aid. The student must notify the program director in writing of his or her wish to return to the PA program or to extend the personal leave at least sixty calendar days prior to the anticipated date of re-entry. The student desiring an extension beyond one calendar year may be required to apply for readmission to the PA program. When a leave of absence is taken, the program director may require the student to repeat some or all of the courses completed prior to the leave of absence. In all cases of leave of absence, the student is required to complete the full curriculum to be eligible to earn the PA certificate.

For purposes of deferring repayment of student loans during a school-approved leave of absence, federal regulations limit the leave to six months.

Withdrawal

If a student withdraws, including involuntary withdrawal for academic reasons, tuition is prorated according to the following schedule:

Before classes begin:	Full amount
During first or second week:	80%
During third to fifth week:	60%
During sixth week:	20%
After sixth week:	none

Student fees are nonrefundable after classes begin.

Voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. Per letter, the program director will notify the offices of the registrar and financial aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been disbursed. The student should also contact these offices to ensure that they have fulfilled any responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date.

Duke University School of Medicine Code of Professional Conduct

All entering medical students are required to sign an Honor Code attesting to high ethical standards in school performance. The rights and responsibilities of students with regard to university-wide regulations pertaining to student conduct can be found in the *Duke Community Standard in Practice: A Guide for Undergraduates*.

The Duke University School of Medicine strives to educate health professional students who have a high capacity for ethical professional behavior. Since training in professional behavior is a part of training in the health professions enrolled students commit themselves to comply with all regulations regarding conduct established by Duke University (the Community Standard and the Bulletin of Information and Regulations of Duke University), the School of Medicine and the individual's own academic program, as well as the Social Media Policy of the Duke University Health System ([link](#)). Professionalism is an academic issue and failure to demonstrate prescribed professional standards may jeopardize advancement and graduation in the same way as other academic matters. These standards closely follow those established and expected for the medical profession for which the student is training and are intended to serve as a precursor to future professional expectations.

Statement of the Code of Professional Conduct

The Code of Professional Conduct is intended to promote:

- Intellectual integrity and honesty in all endeavors
- Concern for the welfare of others and respect for the rights of others
- Professional demeanor and behavior

Students will be expected to hold themselves to these standards:

The student will not:

- Cheat;
- Lie;
- Alter or falsify academic, research or patient documents (both paper and electronic);
- Commit plagiarism or submit for course work that of another individual, unless it is expressly as part of an accepted group learning exercise as defined by the Instructor;
- Participate in academic activities, including patient care, having used non-prescribed psychotropic substances (including alcohol) or having inappropriately used prescribed substances;
- Engage in romantic, sexual, or other nonprofessional relationships with a patient or a patient's family member, even upon the apparent request of a patient or patient's family member;

- Engage in disruptive behavior in the classroom, clinic, hospital, or laboratory that might interfere with the learning, work or clinical care of others;
- Gain or provide unauthorized access to academic or administrative files, patient medical records, or research documents, via computer or any other means or method; and
- Misrepresent him or herself as a licensed or certified health care provider;

The student will:

- Offer original work for each assignment or learning task;
- Admit errors to his/her supervisor and not knowingly mislead others in the classroom, clinical setting or laboratory;
- Respond promptly to official communications from the school, comply with attendance standards for learning activities (including assigned call duties), and meet all School of Medicine mandatory deadlines;
- Engage in the responsible and ethical conduct of research;
- Treat patients or research subjects, their family members, and his/her colleagues with respect and dignity;
- both in their presence and in discussions with others, and maintain appropriate privacy and confidentiality of patient communications and records;
- Recognize the limitations of his/her knowledge, skills, or physical or emotional state, and seek supervision, advice, or appropriate help before acting;
- Learn to recognize when his/her ability to function effectively is compromised, ask for relief or help, and notify the responsible person if something interferes with the ability to perform clinical or research tasks safely and effectively;
- Deal with colleagues in a considerate manner and with a spirit of cooperation, and avoid offensive language, gestures, or remarks while interacting with all persons encountered in a professional capacity regardless of race, color, ethnicity, religion, national origin, age, sex, gender identity, sexual orientation, disability or socio-economic status;
- Take personal action to support equity and inclusivity in the learning environment;
- Maintain a neat and clean appearance, and dress in attire that is appropriately professional and safe for the patient population served or the learning activity (and when in doubt, ask his/her instructor for guidance); and
- Report promptly any witnessed violations of the Code of Professional conduct to a school official or via the website: https://duke.qualtrics.com/SE/?SID=SV_0xINCG6gxBow5Rr.

Scope of the Code of Professional Conduct

The Code of Professional Conduct is designed to promote the professional development of students in the School of Medicine. It should be understood that these guidelines represent standards to strive for. It should also be recognized that this code cannot anticipate every potential offense and that unprofessional behavior not specifically mentioned in this code can still be subject to academic sanctions. Specific incidents will be considered in the context in which they occur. In addition, the magnitude and chronicity of infractions will be taken into account. Finally, it is important for students to understand and accept that professional behavior in the classroom, laboratory, and clinical setting is considered to be as significant an element of academic performance as subject-related evaluations such as Molecules and Cells examinations or clinical performance in Internal Medicine.

The Code of Professional Conduct is intended to guide the professional behavior of students studying in the health professions programs and applies to all endeavors and conduct pertaining to those studies. It is not intended to guide behavior that is a part of a student's private life away from his or her studies in a direct way, but students should be aware that society has high standards for the conduct of medical professionals, and such behavior may come to the attention of the school in several ways and become the focus of a Code of Professional Conduct investigation.

The Code of Professional Conduct applies to a student while enrolled, and also after graduation in matters pertaining to certifying credentials, issuing transcripts, and verifying degrees that have been granted by the School of Medicine

Civil and Criminal Charges/Offenses

Academic sanctions may be imposed on individuals who are

- **being charged with an offense in the civil justice system.** The school will generally not pursue an investigation until the outcome of the civil court proceeding is known, unless the alleged offense is such that

allowing the student to continue his or her studies could be detrimental *to the safety of patients or other members of the school*, as determined by the vice dean for education.

- **being charged with a criminal offense.** The student is obligated to report this to the vice dean for education immediately. If a matriculating student has been charged with a criminal offense between the time he/she wrote an application and the time he/she arrives at school, he/she should inform the vice dean before arrival. If the school later discovers that a student has withheld disclosure of a criminal charge, he/she may be subject to immediate dismissal by the vice dean. *In all situations, the student may not be allowed to continue the course of study until cleared of a criminal charge, as determined by the vice dean for education.* This does not reflect a “guilty until proven innocent” standard, but rather, the obligation of the school to ensure the safety of patients and other members of the school.

Academic Sanctions and Appeals in the School of Medicine

Academic Performance Principles

All students enrolled in educational programs in the School of Medicine are expected to achieve a specified level of academic performance and abide by the Standards of Professional Conduct which describes the personal and professional behavior expected of students training in the health sciences.

Professionalism is an integral part of each academic program’s performance standards and is incorporated into the student’s academic assessment.

Procedures dealing with unacceptable academic performance (including unprofessional behavior) are to be developed by each academic program. The initial determination of unacceptable academic behavior or unprofessional conduct is performed at the educational program level.

Unsatisfactory Academic Performance

Academic programs who wish to place students on academic probation, suspension or dismissal must notify the vice dean for education and supply relevant material justifying the sanction.

The vice dean for education is responsible for placing individuals on *academic probation, suspension or dismissal upon a finding of unsatisfactory academic performance.*

The vice dean may support or recommend an alternative sanction depending on the situation, information provided, and further investigation.

Student Appeals

A student may appeal to the Academic Appeals committee a decision of the vice dean for education if the student feels that the process the program used in recommending the sanction was unfair or that the sanction levied by the vice dean was inappropriate based on the circumstances surrounding the situation.

Academic Sanctions Appeals Process

The Academic Appeals Committee (AAC)

Membership

- One faculty member from each educational program (MD, MS, PA, DPT, Path Assist., Op Tech).
- Each program will select one student and one alternate student from a different academic year to serve as representatives to the AAC. Students will serve as needed only for appeals of actions concerning fellow students enrolled in their own program (e.g., medical student representative for medical students, DPT student representative for DPT students, etc.). In the event that the student representative is in the same class as the appellant, the student alternate will serve.
- Faculty members will serve a 1 year term (renewable annually for a total of three terms) and appointments will be staggered such that new members will join experienced members. Students will serve a one year term.
- If a committee member was involved in recommending the sanction that is being appealed, an alternate member from that program’s faculty is selected in their place.
- The chair will be selected by the vice dean for education.
- The vice dean will serve ex-officio to assist with process but will not participate in discussions or deliberations.

Procedures

- The student must submit their appeal in writing along with supporting documents to the vice dean for education within 10 business days of being notified of an academic sanction. The written appeal should

address each of the reasons that were provided for the sanction and state why the sanction is not appropriate in their situation. In essence the student should answer the question, "I should not be sanctioned because..."

Any background information to support the student's argument should be provided at that time.

- Pending the determination of the appeals committee, the student will be allowed to continue course work provided they are not felt to be a threat to themselves or others.
- A list of the committee members who will be participate on the committee will be forwarded to the student. The student has the option of challenging any member of the committee that is felt to be prejudiced against them because of personal interactions, previous assessments, or participation in prior academic sanction committees. These members will be replaced by faculty members who have no previous interactions with the student.
- The vice dean will create a summary report for the committee explaining the reason for the sanction and include supporting documents from the program and student.
- The vice dean will supply the student's written appeal request, the summary report and any other pertinent documents to the committee for review.
- The committee will hold a meeting within a reasonable time to make a decision about the appealed sanction.
- At least 72 hours prior to the meeting, all material to be considered, other than the interviews themselves, will be distributed to the committee members and the student for their review.
- The student will be given an opportunity to explain in person to the committee their rationale as to why the sanction was not appropriate and should be reversed or modified.
- The educational program will be given the opportunity to present why they recommended that the student be sanctioned.
- The committee may ask for additional information and question other individuals as necessary to reach a decision about the appeal request.
- The chair of the committee will inform the vice dean for education of its recommendation in a timely manner after the committee meeting (typically within a week). The committee can uphold the vice dean's sanction, recommend another sanction or recommend no sanction.
- The vice dean of education will then notify the student and other interested parties of the committee's decision.
- The student will have 10 business days after notification of the outcome of the appeal to submit a request to have the dean of the School of Medicine review the appeals process. An appeal to the dean may be made only upon the grounds of improper *procedures* in the process rather than continued disagreement about the outcome of the process. The dean will review the information related to the process of the appeal and determine whether it was appropriate. The dean can uphold the committee's decision, recommend another sanction, recommend no sanction, or send the matter back to the committee for further consideration.
- Once the dean of the School of Medicine upholds a decision of dismissal, the student relinquishes student status and is no longer enrolled in the University.

Committee meeting procedures

- At least 72 hours prior to the committee meeting the members and student will have access to:
 - The Vice Dean Letter to the student indicating the sanction and it's reason
 - The written appeal request by the student indicating why the sanction is not appropriate
 - Supporting documents from the program as to why they requested the student be sanctioned. This includes such things as exam scores, learning contracts, performance reviews, academic counseling attempts, remediation efforts, police reports etc.
 - Supporting documents from the student as to why the sanction should not be enforced.
 - The names of all faculty, students, or staff that will attend the meeting
- The student has the right to be present at the appeals committee for the portion of the meeting that involves the education program's presentation of the rationale for the recommended sanction and questions by the committee to the program's representatives. The student is not permitted to be present for the deliberations of the committee.
- The committee meeting will begin with a review of the sanction and the provided materials.
- The education program that has sanctioned the student will present the reasons for the recommendation and answer any questions that the committee may have. Depending on the issue, additional faculty or other students who are involved may be asked to attend and provide information to the committee.

- The student will then present to the committee why they feel the sanction is inappropriate or should be reconsidered and answer any questions the committee may have. The student may request that the committee also hear information from other faculty or students with knowledge about the circumstances surrounding the reasons for the sanction. These individuals should be able to provide specific clarifying or defining information and not act as “character witnesses”.
- Before making its recommendation the committee may request to meet with other faculty or students that may be able to provide additional information or insight into the circumstances related to the recommended sanction.
- The committee will discuss the issues and reach a recommendation by a majority vote as to whether the sanction should be upheld, changed to a lesser sanction or removed.
- The chair will draft a summary of the meeting and the committee’s recommendation and circulate to the committee members for approval.
- Once approved, the recommendation will be communicated to the Vice Dean for Education who will notify the education program and the student.

Technical Standards

The candidate for successful completion of the Physician Assistant Program must be able to perform the following skills:

Observation

- Observe materials presented in the learning environment including audiovisual presentations in lectures and laboratories, microscopic examination of microorganisms, gross organs, and tissues in normal and pathologic states.
- Observe patients, both at a distance and closely. This ability requires functional vision, hearing and somatic sensation.

Communication

- Elicit information from patients, including the ability to speak, hear and observe patients and perceive nonverbal communications. Describe changes in mood, activity and posture.
- Communicate with patients and their families and the health care team through oral, written, and electronic forms.
- Convey sensitivity and respect in all communications with patients and their families as well as all members of the health care team.

Motor

- Elicit information from patients by palpation, auscultation, percussion and other components of the physical examination.
- Execute movements reasonably required to provide general care and emergency treatment to patients. Such skills require coordination of gross and fine muscular movements, equilibrium and sensation.
- Manipulate equipment and instruments to perform basic laboratory tests and medical procedures required to attain curricular goals (e.g. needles, stethoscope, ophthalmoscope, tongue blades, intravenous equipment, gynecologic speculum, and scalpel).

Intellectual-Conceptual, Integrative and Quantitative Abilities

- Apply knowledge and reasoning to solve problems as outlined by the curriculum.
- Comprehend three dimensional relationships and the spatial relationships of structures.
- Collect, organize, prioritize, analyze and assimilate large amounts of technically detailed and complex information within a limited time frame. This information will be presented in a variety of educational settings, including lectures, small group discussions, and individual clinical settings. The candidate should be able to analyze, integrate, and apply this information appropriately for problem solving and decision-making.

Behavioral and Social Attributes

- Possess the ability to use his/her intellectual ability, exercise good judgment, and complete all responsibilities attendant to the diagnosis and care of patients.
- Develop relationships with patients and colleagues.
- Tolerate physical, mental, and emotional stress in training and patient care.

- Be adaptable, flexible and able to function in the face of uncertainty within the healthcare team. He/she must have a high level of compassion for others, motivation to serve, integrity, and a consciousness of social values. Possess sufficient interpersonal skills to interact positively with people from all levels of society, all ethnic backgrounds, and all belief systems.
- Accept criticism and respond by appropriate modification of behavior.
- Form a compassionate relationship with his/her patients while maintaining appropriate boundaries for a professional relationship.

The faculty of the Duke University Physician Assistant Program recognizes its responsibility to present candidates for the PA degree who have the knowledge, attitudes and skills to function in a broad variety of clinical situation and to render a broad spectrum of patient care. The Admissions Committee is responsible for adhering to these technical standards during the selection of Physician Assistant students.

If you have any questions about this document or whether you meet the standards as described above, please contact the Duke Physician Assistant Program Admissions Office.

Tuition and Fees¹

On notification of acceptance, prospective PA students are required to pay a nonrefundable first registration fee of \$475, prematriculation background check fee of \$75, \$100 for a health screening check, as well as a nonrefundable program deposit of \$475. For those who do matriculate, the program deposit is applied to the cost of tuition.

2015-2016

Class of 2016 Yearly Tuition: \$38,095

Class of 2017 Yearly Tuition: \$38,857

Full cost of attendance budgets may be found on the Office of Financial Aid website: <http://medschool.duke.edu/education/financial-aid/student-budgets>.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the PA program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, evidence of other comparable health insurance coverage must be provided. The Student Health Fee is mandatory for all students.

E-mail and Computer Use

Important information is usually communicated by e-mail in the PA program. Students are expected to check their e-mail twice a day.

Use of e-mail should be consistent with professional standards. Use of computers during class must be limited to tasks associated with the learning activity. E-mail may not be sent to large lists of addressees other than within the PA program without clearance from the PA program and the organization involved.

Please review the Duke Group e-mail policy at https://oit.duke.edu/email-accounts/group_email/group_email_policy.php for specific criteria. E-mail addressed to PA classes should be addressed as bcc (blind copy) to suppress the long list of addresses. Appropriate use of computers and e-mail, both in the classroom and elsewhere, is an academic issue.

In addition, these university policies apply:

- Use resources only for authorized purposes.
- Do not share your user ID and password with family or friends. Protect your user ID and system from unauthorized use. You are responsible for all activities on your user id or that originate from your system. Your user ID and password act together as your electronic signature.
- Do not create user accounts on your Duke-issued laptop so that others may use your computer.
- Access only information that is your own, that is publicly available, or to which you have been given authorized access.
- Use only legal versions of copyrighted software in compliance with vendor license requirements.

1. Subject to change and Board approval

- Be considerate in your use of shared resources. Refrain from monopolizing systems, overloading networks with excessive data, degrading services, or wasting computer time.

“Peer-to-Peer” (P2P) file sharing programs consume a disproportionate share of Duke’s bandwidth, and files shared on these or similar networks may be protected by copyright. Sharing copyrighted files is a violation of federal law and not a permissible use of Duke resources. Please review Duke’s policy on file sharing at http://www.oit.duke.edu/net-security/security/secure_computer/downloading.php

In making acceptable use of computer resources you must not

- use another person’s system, files, or data without permission;
- give your password to another person;
- use computer applications to decode passwords or access-controlled information;
- attempt to circumvent or subvert system or network security measures;
- engage in any activity that might be purposefully harmful to systems or to any information stored on them, including but not limited to propagating viruses, worms, Trojan horse programs, or damaging files;
- make or use illegal copies of copyrighted software, videos, or audio files;
- use mail or messaging services to harass or intimidate another person;
- waste shared computing or network resources, for example, by intentionally placing a program in an endless loop, sending chain letters or unsolicited mass mailings, or downloading large files unrelated to the educational program; or
- use the university’s systems or networks for commercial, political, or illegal purposes.

Please review Duke’s Computing and Networking: Acceptable Use Policy at <http://security.duke.edu/duke-acceptable-use-policy>.

Wireless Networking at Home

Strangers have the ability to attach to the wireless Internet service you have in your home. This could allow strangers access to your information. You can prevent this.

- Activate encryption on your wireless router and configure your workstation/laptop with the corresponding encryption key.
- Configure your wireless router to refrain from broadcasting the SSID.
- Filter the connections by MAC address.

Social Networking Policy

Many individuals participate in social media for a variety of reasons. To connect with professional networks, to find out quickly what’s happening at other places, to enhance productivity and team-building, and to put together ad-hoc groups or meetings are just a few examples of why someone uses social networking. Exchanging and sharing information can improve our personal and professional lives. However, social networking exposes one to an unsolicited audience and set of experiences, and requires continual attention to successfully manage our personal and professional lives online.

The following are general policies regarding social networking as a Duke University student.

- Think before you post. There’s no such thing as a “private” social media site. Search engines can turn up your posts years later. Don’t post something today that may haunt you later.
- Maintain confidentiality. Do not post or discuss sensitive, confidential, proprietary, or protected health information about students, employees, patients, or other members of the Duke community. Use good ethical judgment; follow federal guidelines and university policies such as the Duke Confidentiality Agreement.
- Be respectful. If readers see your affiliation with Duke, they may read your words as representing the university, even if you provide a disclaimer saying your views are your own. As a general rule, be respectful and don’t post anything you would be uncomfortable saying in a public setting—or in front of your colleagues, fellow learners, supervisor, etc.
- Be transparent about your role at Duke. If you participate in or maintain a social media site on behalf of the university, clearly state your role and goals. Strive for accuracy, correcting errors quickly and visibly. If you have questions about whether it is appropriate to write about certain material, ask your supervisor, advisor, or program director first.
- Protect your identity. Don’t provide personal information about yourself or others that scam artists and identity thieves might steal. This includes telephone numbers, mailing addresses, and e-mail addresses.

- Respect university time and property. As stated in Duke's "Computing and Networking: Acceptable Use" policy, university computers and work time are to be used for university-related business. It's appropriate to post at work if your comments are directly related to accomplishing work goals, but maintain your personal site on your own time using non-Duke computers.
- Any violation of HIPAA or other university policies may result in appropriate disciplinary action including, but not limited to, dismissal from your program and criminal and/or civil charges and fines.

Financial Aid

Most Duke PA students finance their education through student loans up to the cost of the school-approved budget, by qualifying for federal, state, or private education loans. All financial aid awards are made on the basis of documented financial need. The financial aid application process requires completion of the Free Application for Federal Student Aid (FAFSA) if applying for federal education loans.

The North Carolina Forgivable Education Loan for Service provides financial assistance in the form of loans up to \$10,000 per year for North Carolina residents; these loans may be cancelled through approved service in shortage areas, public institutions, or private practice. Applicants may call (866) 866-2362 for further information about this loan program.

The US Public Health Service has several programs that offer scholarships, stipends, and loan repayment to PA students who commit to varying periods of employment within designated facilities. Interested applicants can call the National Health Service Corps Program directly at (800) 221-9393 or go to <http://nhsc.hrsa.gov/> for further information.

Limited scholarship funds are available through the Duke Physician Assistant Program. The Physician Assistant Scholarship Committee will review each applicant and make decisions in the Spring prior to matriculation. This scholarship may reduce the amount a student borrows in education loan funding.

Full cost of attendance and budgets may be found on the Office of Financial Aid website: <http://medschool.duke.edu/education/financial-aid/student-budgets>, or by contacting the Office of Financial Aid, Box 3067, Duke University School of Medicine, Durham, NC 27710 (<http://medschool.duke.edu/education/financial-aid-office>) or by e-mailing finaid@dm.duke.edu.

Student Employment

Due to the rigors of the curriculum, the majority of students find it difficult or impossible to work. Part time employment over breaks and holidays is at the discretion of the student, however students may not perform any medical tasks or procedures under the auspices of their role as Duke Physician Assistant Students. The following rules apply to students who wish to be employed during their training:

- Any student working while attending the program must notify his/her advisor.
- Working students must comply with the program's academic schedule and are
- prohibited from working more than twenty hours per week. Part-time employment
- must never interfere with class or clinical assignments.
- Any student who is unable to maintain satisfactory academic standing as outlined above, will be required to terminate his/her employment.

More detailed information regarding financial aid can be obtained from the Office of Financial Aid, Box 3067, Duke University School of Medicine, Durham, NC 27710 (<http://medschool.duke.edu/education/financial-aid-office>) or by e-mailing finaid@dm.duke.edu, or by calling (919) 684-6649. Full cost of attendance budgets may be found on the Office of Financial Aid website: <http://medschool.duke.edu/education/financial-aid/student-budgets>

Commencement

To receive the MHS degree at the May commencement ceremony, the physician assistant student must successfully complete 93 course credits including all preclinical courses, and all clinical rotations scheduled to that date. The PA program certificate of completion is awarded four months later, following the student's completion of a total of 109 credits, the remaining clinical rotations, and the senior seminar.

PA students should be aware that failure to begin or complete a clinical rotation as scheduled could delay receipt of both the MHS degree and the PA program's certificate of completion. Furthermore, any incomplete rotations must be completed prior to receiving the PA program certificate.

Courses of Instruction

Course credits are the recognized units for academic work in the PA program. All courses are required, no transfer credit is accepted, and no credit is granted for past experiential learning.

Preclinical Year Courses

PHYASST-200. Basic Medical Sciences. The basic facts, concepts, and principles which are essential in understanding the fundamental mechanisms of immunology, pathology, genetics, microbiology and nutrition. This course presents the basic methods of clinical problem solving and serves as a prerequisite to the clinical medicine course by emphasizing the underlying principles of the etiology, management, and prevention of disease processes. Credit 2. Streilein

PHYASST-201. Physiology. The basic concepts and principles that are essential to comprehending the fundamental mechanisms of human physiology at the cellular, tissue and organ levels and the requirements for the maintenance of homeostatic control. This course lays the foundation for understanding the underlying principles of the etiology, management and prevention of human disease processes. Credit 2. Jakoi.

PHYASST-203. Introduction to Prevention & Population Health. This course uses a team-based learning approach to develop appreciation of the unique contributions of various health care providers in providing best practice prevention care to populations. Web-based modules on cultural competence, health literacy and community health are also used. Student teams meet in lecture and small group settings for organized activities and community assignments. A final team project may be required. Credit: 1, Melcher.

PHYASST-205. Anatomy. Functional and applied anatomy stressing normal surface landmarks and common clinical findings. Topics for this course are sequenced with the physical diagnosis components of Patient Assessment and Counseling I (PHYASST-231). Cadaver prosections, anatomic models, lectures, and computer software are utilized in teaching this course. Credit: 4. Holmes.

PHYASST-210, 211, 212. Diagnostic Methods I, II, III. The essentials of ordering, interpreting, and performing diagnostic studies used in the screening, diagnosis, management, and monitoring of common diseases. Topics for this course are sequenced with Clinical Medicine (PHYASST 220, 221, 222) and Pharmacology and Therapeutics, I, II, III (PHYASST 223, 224, 225). Lectures, small group discussions, and hands-on laboratory sessions are the teaching strategies utilized in this course. Credit: 3; 2; 1. Briggs

PHYASST-220, 221, 222. Clinical Medicine I, II, III. The essentials of diagnosis and management of the most common clinical problems seen by primary care practitioners. Using an organ systems and life stages approach, clinical information is presented in conjunction with appropriate correlative lectures and labs in pathophysiology, emergent and preventive care. Patient cases are used in the small group setting to enhance readings and lectures. Students develop skills in clinical reasoning across multiple medical disciplines during term-based Synthesis Sessions. This is a core course around which most other courses are organized and is a corequisite for Pharmacology and Therapeutics, I, II, III (PHYASST 223, 224, 225) and Diagnostic Methods, I, II, III (PHYASST 210, 211, 212). Credit: 5; 10; 10. Streilein.

PHYASST- 223, 224, 225. Pharmacology and Therapeutics I, II, III. The essentials of basic pharmacological principles and disease process therapeutics. Topics for this course are sequenced with Clinical Medicine (PHYASST 220, 221, 222) and Diagnostic Methods, I, II, III (PHYASST 210, 211, 212) and are provided primarily in lecture format. Credit: 1; 1; 1. Mesaros

PHYASST-230. Fundamentals of Surgery. The course focuses on the basic surgical concepts needed for the PA to function in primary care settings as well as major surgical areas. The course emphasizes surgical concepts, topics and surgical technique. A substantial part of this course consists of essential hands-on laboratory exercises emphasizing surgical skills required in a primary care setting. Credit: 3. Hendrix

PHYASST-231, 232, 233. Patient Assessment and Counseling I. An introduction to history-taking, physical examination techniques, counseling, documentation and presenting clinical information along with the practical application of these clinical skills. Emphasis is placed on acquiring the skills, knowledge and sensitivity needed to communicate and intervene effectively in a wide variety of patient encounters. Teaching methods include lecture, small group demonstrations and practice sessions as well as clinical assignments to examine and/or interview standardized patients and patients in hospital, and outpatient settings. Students also access standardized patients in a controlled setting. Audiovisuals and asynchronous learning are also used. Credit: 3; 3; 3. Hudak

PHYASST-251. Practice and the Health System. An introduction to the structure and administrative principles in use in health care organizations, and professional issues review. A lecture series taught by an interdisciplinary faculty and by community experts in health care organization. Topics include the patient as consumer, third-party payment, public policy trends, organizational behavior, legal problems, and the unique place of PAs in the health care system. Includes asynchronous learning activities. Credit: 1. Gradison

PHYASST-255. Evidence-based Medicine I. A lecture and seminar course that provides a practical approach to making sound medical decisions on the basis of current evidence in the medical literature. Through a series of didactic presentations, group exercises, and reading, students will learn the basic principles of evidence-based medicine. Basic skills in using MEDLINE and other medical databases will be emphasized and practiced. Research principles, research ethics, and basic statistical review are introduced. Credit: 2. Morgan

Preclinical Year Electives

PHYASST-261. Beginning Medical Spanish. This elective course is designed to improve students' communication in clinical situations with patients whose native language is Spanish. The focus of the instruction will be on learning conversational skills in order to take clinical histories, conduct physical examinations and give instructions to Spanish speaking patients. For students with very little or no previous Spanish language training or experience. Credit: 1. Streilein

PHYASST 262. Intermediate Medical Spanish. This elective course is designed to improve students' communication in clinical situations with patients whose native language is Spanish. The focus of the instruction will be on strengthening conversational skills in order to improve students' ability to take clinical histories, conduct physical examinations and give instructions to Spanish speaking patients. For students with previous, but not extensive, Spanish language training or experience. Credit: 1. Streilein

PHYASST 263. Advanced Medical Spanish. This elective course is designed to refine students' communication in clinical situations with patients whose native language is Spanish. The focus of the instruction will be on strengthening conversational skills specific to taking clinical histories, conducting physical examinations and giving instructions to Spanish speaking patients. For students with extensive previous experience speaking Spanish. Credit 1. Streilein

Clinical Year Courses–Required

PHYASST 299. Bridge: The Path to Patient Care. This one-week course provides physician assistant students with preparation to begin the clinical year rotations. Topics covered include: preceptor expectations, self-care, electronic medical records access, professionalism and Advanced Cardiac Life Support. Credit: 2. Blazar

PHYASST 300A, 300B. Primary Care. These two, four-week rotations are an opportunity for physician assistant students to understand the principles of Family Medicine and their application in community practice. Students are introduced to problems commonly encountered by family physicians and physician assistants, as well as to the unique aspects of community practice. Students confront the diversity of community and family health care needs, as well as occupational and environmental issues impacting health and learn about some of the resources to meet those needs. Many of the training sites provide care for underserved populations in rural North Carolina communities. Credit: 4, 4. Staff

PHYASST-305. Evidence-based Medicine II. During this four-week course during the clinical year, PA students complete an evidence-based review paper on a clinical question of interest. They present their findings to faculty and student colleagues. Credit: 3, Morgan

PHYASST-310. Behavioral Medicine. This four-week rotation provides physician assistant students with an opportunity to participate in the care of patients with psychiatric illness and/or behavioral disorders. Rotation sites may provide students with inpatient, outpatient, or mixed experiences. This rotation facilitates the acquisition of communication and behavioral modification skills which are useful in the primary care setting. Credit: 4. Staff

PHYASST-390. Senior Seminar. In small group and lecture settings, students review common medical topics and procedures. A final summative evaluation is part of this course, which also serves as preparation for the PA National Certifying Examination (PANCE). Credit: 2. Stouder

Medicine

PHYASST-320A, 320B. Internal Medicine. These two, four-week rotations provide the opportunity for physician assistant students to understand the principles of general internal medicine and their application in clinical practice. Students are introduced to problems commonly encountered in inpatient and/or community internal medical practice. Students confront a diversity of health care needs and issues impacting general medical health and learn about resources required to meet these needs. Credit: 4, 4. Staff

Obstetrics/Gynecology

PHYASST-370. Obstetrics/Gynecology. This rotation is a four-week opportunity for physician assistant students to understand the principles of obstetrics and gynecology. Special emphasis is placed on preventive gynecologic care, common gynecological complaints, and prenatal care. Credit: 4. Staff

Pediatrics

PHYASST-360. Pediatrics. This four-week rotation provides the opportunity for physician assistant students to understand the principles of pediatric care in the outpatient setting. Students are introduced to problems commonly encountered by pediatric primary care providers, as well as unique aspects of community based pediatric medicine. Special emphasis is placed on communication skills and relating sensitively to both children and parents. The student gains familiarity with normal growth and development, pediatric preventive medicine, and evaluation and management of common childhood illnesses. Credit: 4. Staff

Surgery

PHYASST-340. General Surgery. This four-week rotation is an opportunity for physician assistant students to understand the general principles of surgery and develop surgical skills. Special emphasis is placed on preoperative evaluation and preparatory procedures, assisting at the operating table, and management of patients through the postoperative period. Credit: 4. Staff

PHYASST-350. Emergency Medicine. This four-week rotation is an opportunity for physician assistant students to understand the principles of emergency medicine. Students are introduced to medical and surgical problems commonly encountered in the emergency department setting. The emphasis is on gaining outpatient procedural skills, triage of patients, and learning to recognize and begin treatment of emergent medical and surgical problems. Credit: 4. Staff

Clinical Year Courses - Elective

In addition to the above required core rotations, each student is required to complete two electives that can be chosen from among the following rotations. All are four weeks long. Each of these electives is four credits. Staff

General Electives

PHYASST-300E Primary Care. This rotation emphasizes the outpatient evaluation and treatment of conditions common at the primary care level and the appropriate health maintenance measures for different age groups. Topics Include: 1) Family Medicine, 2) Urgent Care. Credit: 4. Staff

PHYASST-301. Occupational Medicine. This rotation offers experiences in occupational medicine assessment and problem management. Credit: 4. Staff

PHYASST-302. Geriatrics. This rotation emphasizes the evaluation and management of geriatric patients in outpatient long-term care or hospital setting. Credit: 4. Staff

PHYASST-303. Global Health. This rotation offers clinical experience in international rotation sites. Public health, health system and common clinical conditions will be emphasized. Additional costs will be incurred by the student for immunizations, travel, housing, and educational fees for the host country. Credit: 4. Staff

PHYASST-304. Prevention and Health Promotion. This rotation is an intensive experience in health maintenance and disease prevention. Direct care of patients constitutes approximately 50% of the clinical rotation. The remaining effort will be focused on activities designed to learn and incorporate health promotion and disease prevention activities into clinical practice. Credit: 4. Staff

PHYASST-306. Integrative Medicine. This elective provides an evidenced-based didactic and experiential understanding of integrative medicine. The core focus is on key overlaps between patient-centeredness, prevention, mindfulness, health behaviors, long range health planning, patient empowerment, and complementary/alternative health practices. Credit: 4. Staff

PHYASST-307. Medical Informatics. This elective provides the students with an opportunity to explore the integration of medicine and information technologies. Through a combination of lecture, observation, and project participation, students will gain an understanding of the role informatics plays in point of care management, patient safety, and healthcare quality improvement. Credits: 4. Staff

PHYASST 309 – Public Health and Healthcare in Cuba. This elective provides an opportunity for students to examine the strengths and weaknesses of a health system that emphasizes primary care and the integration of public health with primary care. The course consists of preparatory seminars designed to provide an overview of the Cuban public health and healthcare systems, a one-week experience in Cuba, and a reflective project upon return. Credit: 1. Morgan

PHYASST-310E. Behavioral Medicine. This rotation provides additional emphasis on communication and behavioral modification skills, which are useful in the primary care setting. Topics include: 1) General Behavioral Medicine, 2) Pediatric Behavioral Medicine. Credit: 4. Staff

PHYASST-320E. Internal Medicine. This rotation provides the student with an opportunity to apply basic medical knowledge to the problems and situations encountered in an internal medicine setting. Topics include: 1) Inpatient internal medicine, 2) Outpatient internal medicine. Credit: 4. Staff

PHYASST-340E. General Surgery. This rotation emphasizes preoperative evaluation and preparatory procedures, assisting at the operating table, and management of patients through the postoperative period to discharge. Credit: 4. Staff

PHYASST-350E. Emergency Medicine. This rotation provides opportunity for students to increase their knowledge of the triage and management of medical emergencies. Credit: 4. Staff

PHYASST-360E. Pediatrics. The rotation provides familiarity with normal growth and development, pediatric preventive medicine, and evaluation and management of common childhood illnesses. Topics include 1) Outpatient Pediatrics, 2) inpatient Pediatrics. Credit: 4. Staff

PHYASST-370E. Obstetrics/Gynecology. This rotation provides students with the opportunity to learn about common gynecological problems, pregnancy, and delivery. Credit: 4. Staff

Obstetrics/Gynecology

PHYASST-371. Maternal/Fetal Medicine. This rotation emphasizes prenatal and postpartum care. Credit: 4. Staff

PHYASST 372 – Reproductive Endocrinology and Infertility. This elective provides students an opportunity to learn about the evaluation of infertility and the assisted reproductive treatment options that are available for couples experiencing difficulty achieving pregnancy. Credit: 4. Staff

Medicine

PHYASST-321. Cardiology. This rotation offers experiences in cardiovascular assessment and problem management. Credit: 4. Staff

PHYASST-322. Dermatology. This rotation offers experiences in dermatological assessment and problem management. Credit: 4. Staff

PHYASST-323. Endocrinology. This rotation offers experiences in the evaluation and treatment of a variety of endocrine problems. Credit: 4. Staff

PHYASST 324 – Pain Medicine. This elective provides students with an opportunity to learn about the evaluation and treatment of acute and chronic pain issues, utilizing multi-faceted therapeutic approaches. Credit: 4. Staff

PHYASST-325. Hematology/Oncology. This rotation offers exposure to the principles of hematology and oncology and their application in clinical practice. Oncology topics include 1) general oncology, 2) breast oncology, 3) gynecological oncology, 4) neuro-oncology 5) hematologic malignancies and bone marrow transplant. Credit: 4. Staff

PHYASST-327. Infectious Diseases. This rotation emphasizes the evaluation and treatment of various infectious diseases. Topics include: 1) General Infectious Disease, 2) HIV. Credit: 4. Staff

PHYASST-328. Gastroenterology. This rotation emphasizes the evaluation and treatment of various gastrointestinal problems. Credit: 4. Staff

PHYASST-329. Palliative Care. This rotation offers experience in palliative and end of life care. Credit: 4. Staff

PHYASST-331. Nephrology. This rotation emphasizes renal assessment and problem management. Credit: 4. Staff

PHYASST-332. Neurology. This rotation emphasizes experiences in neurological assessment and problem management. Credit: 4. Staff

PHYASST-333. Pulmonary Medicine. This rotation emphasizes prevention, cause, diagnosis and treatment of various pulmonary diseases. Credit: 4. Staff

PHYASST-334. Rheumatology. This rotation emphasizes experience with the assessment of joint and connective tissue disorders. Credit: 4. Staff

PHYASST-336. Medical ICU. This rotation offers an opportunity to understand the principles of medicine in an intensive care setting. Credit: 4. Staff

PHYASST-337. Coronary Care Unit. This rotation offers an opportunity to understand the principles of medicine in a coronary care unit. Credit: 4. Staff

PHYASST-338. Radiology. This rotation offers exposure to the variety of diagnostic and radiologic methods. Topics include: 1) general radiology, 2) interventional radiology, 3) neuro-radiology. Credit: 4. Staff

PHYASST-339. Genetics. This rotation offers experiences with patients at risk for or diagnosed with various hereditary syndromes. Credit: 4, Staff

PHYASST-346. Sports Medicine. This rotation offers experiences in the evaluation and treatment of sports medicine problems. Credit: 4. Staff

Ophthalmology

PHYASST-381. Ophthalmology. This rotation offers exposure to the evaluation and treatment of the eye. Credit: 4. Staff

Pediatrics

PHYASST - 308. Pediatric Healthy Lifestyles Program. In this elective, students will explore the myriad causes and complications of pediatric obesity, and the approach to the overweight child and family. Students will participate in direct patient care with a multidisciplinary team in the Healthy Lifestyles Program, as well as have opportunities for community involvement. Credit: 4. Staff

PHYASST-361. Pediatric Cardiology. This rotation offers experiences in pediatric cardiovascular assessment and problem management. Credit: 4. Staff

PHYASST-362. Pediatric Surgery/Cardiothoracic Surgery. This rotation offers experiences in cardiothoracic surgery for pediatric patients. Credit: 4. Staff

PHYASST-363. Pediatric Hematology/Oncology. This rotation offers exposure to the principles of hematology and oncology and their application for pediatric patients. Credit: 4. Staff

PHYASST-364. Pediatric Allergy/Respiratory. This rotation offers exposure to evaluation and treatment of allergy and respiratory problems in the pediatric patient. Credit: 4. Staff

PHYASST-365. Pediatric Endocrinology. This rotation offers exposure to the evaluation and management of endocrine problems in the pediatric patient. Credit: 4. Staff

PHYASST-366. Pediatric Infectious Disease. This rotation emphasizes the evaluation and treatment of various infectious diseases in the pediatric patient. Credit: 4. Staff

PHYASST-367. Intensive Care Nursery. This rotation emphasizes the care of the children in the neonate in the intensive care setting. Topics include: 1) neonatal intensive care unit, 2) pediatric intensive care unit. Credit: 4. Staff

PHYASST-368. Pediatric Emergency Medicine. This rotation offers opportunity to manage the problems and needs of the pediatric patient in the emergency department. Credit: 4. Staff

PHYASST-369 Pediatric Orthopedics. This rotation offers exposure to pediatric orthopedic care in the outpatient and surgical settings. Credit: 4. Staff.

Surgery

PHYASST-341. Cardiothoracic Surgery. This rotation offers experiences in cardi-othoracic surgery. Credit: 4. Staff

PHYASST-342. Otolaryngology. This rotation offers experiences in otolaryngology. Credit: 4. Staff

PHYASST-343. Neurosurgery. This rotation offers surgical experiences in neuro-logical problems. Credit: 4. Staff

PHYASST-344. Orthopaedics. This rotation offers experiences in the evaluation and treatment of orthopaedic problems. Credit: 4. Staff

PHYASST-345. Plastic Surgery. This rotation offers experiences in the plastic and reconstructive surgery setting. Credit: 4. Staff

PHYASST-347. Urology. This rotation offers experiences in the evaluation and treatment of urologic problems. Credit: 4. Staff

PHYASST-348. Pre-Operative Screening Unit. This rotation offers the opportunity to evaluate pre-operative patients. Credit: 4. Staff

PHYASST-349, Surgical Oncology. This rotation offers exposure to surgical oncology.

PHYASST-352. Trauma. This rotation offers the opportunity to evaluate and treat trauma patients. Credit: 4. Staff

PHYASST-353. Surgical ICU. This rotation offers exposure to the problems commonly encountered in a surgical intensive care setting. Topics include: 1) surgical intensive care unit, 2) cardiothoracic intensive care unit. Credit: 4. Staff

PHYASST-354. Vascular Surgery. This rotation offers experiences in the evaluation and treatment of vascular problems. Credit: 4. Staff

PHYASST 355 – Transplant Surgery. This elective provides an opportunity to participate in the evaluation and management of patients requiring organ transplant. Credit: 4. Staff

PostGraduate Physician Assistant Courses

PHYASST-450. Introduction to Health Care Policy. An introduction to the U.S. health care system. A lecture series taught by an interdisciplinary faculty and by community experts in health care policy and organization. Topics include major determinants of health and disparities, how health care is organized, delivered and financed in the U.S., health law and regulation, international comparisons and future trends. 3 Credit. Conover, Strand de Oliveira (Not offered each year.)

School of Medicine Professional Certificate Programs



Duke University Medical Center has responded to the increased need for qualified individuals at all levels in the health care system by developing educational programs designed to equip people for a variety of positions. These programs, which vary in admission requirements and length of training, offer students both clinical and didactic experience. Graduates of these programs are awarded certificates.

Financial information is noted within each program's informational section for all certificate programs.

Ophthalmic Medical Technician

Medical Director: Julie Woodward, MD

Program Director: Deborah K Smith, COMT, BSBA

The Ophthalmic Medical Technician Training program is sponsored by the Department of Ophthalmology, Duke University Medical Center. This is an accelerated one-year certificate program designed to prepare the student to be employed as an ophthalmic medical technician. The program consists of didactic lectures and clinical experiences designed to provide the knowledge and skills necessary for students to understand and perform the technical tasks delegated to them by an ophthalmologist. Orientation and classes begin early in July, and consist of fifty-one instructional weeks including twelve days of personal leave. The first three months consist of core curriculum lectures supplemented with clinical introductory labs and workshops. In the fourth month, clinical rotations begin. Students rotate through various subspecialty departments observing, learning, and demonstrating the skills particular to that service. Students are monitored under the close supervision of clinical support staff and faculty and are evaluated on a routine basis as their skills develop.

Upon satisfactory completion of the curriculum, students receive a certificate from Duke University School of Medicine and are required to take the national Certification Examination of Ophthalmic Technicians administered by the Joint Commission on Allied Health Personnel in Ophthalmology.

Prerequisites for Admission

Official documentation of prior educational experience is required of applicants to the program. Applicants must have completed high school or passed a high school equivalency test. Preference will be shown to applicants who have completed college level courses and/or have some eye care-related work experience. Students must be physically capable of providing quality ophthalmic clinical patient care.

Duke is unable to issue visa documents for this program. Therefore, applicants must be US citizens or have permanent resident status to be eligible for the program.

Application Procedures

The deadline for application submission is April 30th of the year for which admission is requested. Only complete applications will be considered and must contain the following:

- the completed Duke University Medical Center Application for Admission for the Ophthalmic Medical Technician Training Program, which may be found online at <http://dukeeyecenter.duke.edu/node/3450>;
- a \$50.00 nonrefundable processing fee;
- official transcript(s) from schools attended;
- two original letters of recommendation from previous employers or course instructor; and
- a 250-word essay on your reasons or motivations for wanting to enter the OMT Training Program;

The Admissions Committee will review all complete application packets received. Applicants who are selected to continue to the next step in the admission process will be provided instructions for registering for, and scheduling the preadmission test at a testing center near their home. Applicants are responsible for the cost of the preadmission test. The Admissions Committee then reviews all test scores and identifies candidates who will proceed to the next step in the admissions process.

The Admissions Committee invites selected candidates for a personal interview and tour. Following interview day, the Admissions Committee makes the final candidate selections. Applicants are notified no later than May 30th regarding admission to the program. Orientation and classes will begin in early July. Requests for further information may be directed to the program director, Deborah K. Smith.

Applications and more information may be obtained at <http://dukeeyecenter.duke.edu/node/3450>.

Criminal Background Check

Candidates offered admission to the Ophthalmic Medical Technician Program will undergo criminal background checks.

Academic Calendar 2015-2016 (51 weeks)

Fall 2015	July 1 - December 18, 2015
Spring 2016	January 4 - June 16, 2016

Attendance

Students are required to attend all lectures, laboratories, seminars, and clinical assignments. Absences are excused only for illness or personal emergency, and students must notify the program director in advance of an expected absence. Students with three unexcused absences or tardies will be dismissed. An unexcused absence/tardy is one where the program director was not notified in advance. Each student is allowed twelve personal days that may be used for vacation, sickness, or interview days. In addition, the Eye Center is closed for eight holidays yearly as follows:

New Year's Day	Friday, January 1, 2016
Martin Luther King, Jr. Holiday	Monday, January 18, 2016
Memorial Day	Monday, May 30, 2016
Independence Day	Friday, July 3, 2015
Labor Day	Monday, September 7, 2015
Thanksgiving	Thursday, November 26 & 27, 2015
Christmas Day	Friday, December 25, 2015

Registration and Drop/Add Policy

Registration in the Ophthalmic Medical Technician Program is offered on a full-time basis only and part-time enrollment is not allowed. All required course registrations are processed in the Office of the Registrar in the School of Medicine. As the program is only offered full-time, and all courses are mandatory, dropping and adding courses is not permitted.

Grading Standards/Satisfactory Progress

Final grades for all courses are assigned on the following basis:

A = 90-100%

B = 80-89%

C = 70-79%

F = 69% or below

P = Pass

F = Fail

Letter grades are earned on a percentage basis. The student must maintain a minimum of C in all coursework. The initial three-month period is considered probationary. Students may be dismissed for any breach of the Honor Code or code of conduct. The student must maintain a C in all courses to continue on to the clinical portion of the course.

In didactic sections, a grade of C will be required on all examinations. If the student does not achieve a C, one retest may be allowed, at the discretion of the instructor, but will result in the loss of one letter grade. If a C is still not achieved the student will be placed on academic probation. Academic probation is a condition where the student is warned that he/she must study and bring up the grade through individual effort. If the student fails to achieve a C a second time he/she will be withdrawn from the program. The Office of the Registrar in the School of Medicine will be notified in writing of the student's status of academic probation and the status will be noted on the student's academic transcript at the completion of the semester(s) during which this status is assigned.

Laboratory skills will be evaluated on a Pass/Fail basis. The student may have one retest if initial testing is not successful. Retests are at the discretion of the instructor. Students will also be evaluated based on reliability, appearance and professional conduct. Failure in any of these areas may result in dismissal from the program.

Professionalism

Students with any issues about coursework or rotations are to follow the hierarchy of program director - medical director - School of Medicine authorities.

Appeals of Course Grades

A student may appeal a course grade by writing the program director and medical director, providing factual evidence for changing the final course grade. Appeals will be considered individually on their merits and will not be

considered precedent. The program director will notify the student in writing of the appeal decision within three weeks of the appeal.

Appeals of Academic Status (Academic Probation or Withdrawal)

A student placed on academic probation or withdrawal from the program may appeal by indicating in writing to the program director reasons why he/she did not achieve minimum academic standards and factual evidence to support changing the academic standing. Appeals will be considered individually on their merits and will not be considered as precedent. The program director will notify the student of the decision of the appeal in writing within three weeks of receipt of the appeal.

Leave of Absence

The Duke Ophthalmic Medical Technician Training Program is an accelerated program. Time away will result in missing necessary hours, and important information. Excessive time away must be made up. A leave of absence is discouraged, however may be considered on an individual basis. Requests must be submitted in writing to the program director.

Withdrawal

If a student withdraws, including involuntary withdrawal for academic reasons, tuition is refunded according to the following schedule:

Before classes begin:	Full amount
During first or second week:	80%
During third to fifth week:	60%
During sixth week:	20%
After sixth week:	none

Student fees are nonrefundable after classes begin.

Historically, voluntary withdrawals are initiated at the request of the student. Working with the program director, a mutual decision is reached with regard to the effective date of the withdrawal and any academic penalty to be assessed. Per letter, the program director will notify the offices of the registrar and financial aid in the School of Medicine. The Office of the Registrar will process the withdrawal and remove the student from any current and/or future enrollments. The Office of Financial Aid may revoke any financial aid that has been awarded and/or disbursed. The student should also contact these offices to ensure the student has fulfilled all responsibilities with regard to this process. The student's permanent academic record will reflect that he/she was enrolled for the term and that he/she withdrew on the specific effective date. A student, in good academic standing, who withdraws from the program may return to the program at a future date at the start of the semester corresponding to the semester from which they withdraw.

Code of Professional Conduct

Students enrolled in the Ophthalmic Medical Technician Program are expected to adhere to the program's General Policy Statement and to the Duke University School of Medicine Code of Professional Conduct as detailed in the Policies for all School of Medicine programs found elsewhere in this bulletin.

Academic Probation and Suspension

Academic probation may become necessary if a student's academic performance falls below the minimum standard of the program. The program requires a minimum of a C on all course work. Good academic standing may be restored if, after a predetermined length of time, the student's grades attain an acceptable level. Academic probation may also be necessary if a student fails to comply with the program's General Policy Statement or the Duke School of Medicine Code of Professional Conduct. The Office of the Registrar in the School of Medicine will be notified of the student's status of academic probation or suspension and the status will be noted on the student's transcript at the completion of the semester during which the status is assigned. If the student successfully returns to good academic standing from academic probation, the student will be removed; if the student is suspended, however, the statement will remain permanently on the transcript. Good academic standing may be restored if the student's

conduct improves and meets the standards established by the program's General Policy Statement and/or the Duke SOM Code of Professional Conduct. Failure to improve grades or conduct may result in suspension from the program. Egregious or unlawful conduct will result in immediate suspension.

Tuition and Fees

2015-2016 tuition for the program is \$8000.00. Upon acceptance to the program, a \$500.00 nonrefundable deposit must be submitted. This will be applied toward tuition. Full cost of attendance budgets may be found on the Office of Financial Aid website: <http://medschool.duke.edu/education/financial-aid/student-budgets>.

Health Insurance

All students are required to carry full major medical health insurance throughout their enrollment in the program. If the student does not elect to take the Duke Student Accident and Hospitalization Insurance policy, which is included in the Tuition and Fees listed above, evidence of other comparable health insurance coverage must be provided. The Student Health Fee is mandatory for all students.

Financial Aid

Financial aid information is available for all interested applicants by contacting:

The Office of Financial Aid

Box 3067

Duke University School of Medicine

Durham, NC 27710

(919) 684-6649

finaid@dm.duke.edu

<http://www.medschool.duke.edu/education/financial-aid-office>

Full cost of attendance budgets may be found on the Office of Financial Aid website: <http://medschool.duke.edu/education/financial-aid/student-budgets>.

Computer Technology

A personal computer and a personal cell phone are necessary tools for success in the program. Two computers are available in the classroom for student use. We use a shared calendar to communicate the week's activities, assignments, and clinical rotations. We communicate often through e-mail and all students receive a Duke e-mail account to use during their time in the program. To minimize disruptions during the clinical rotations, cell phone text messages are often the communication method of choice.

Transportation Required

Students will rotate to clinical sites located away from the university campus. The student is responsible for reliable transportation to these sites.

Courses of Instruction

Students must satisfactorily complete the following courses. The curriculum includes, but is not limited to, the following:

OPTECH 151. Orientation Lectures. Orientation Lectures will familiarize the student with the eye center, ophthalmic equipment and medical terminology. Students will accompany first year ophthalmology residents to lectures. Independent study is required. Credit: 0.50. *Staff*

OPTECH 152. Basic Science Lecture. These lectures will ground the student in the basic science needed to understand eye physiology. These lectures will set the stage for high performance as clinical rotations begin. Credit: 3.25. *Staff*

OPTECH 153, 153L. Visual Acuity Assessment. The most basic measurement of the eye and the most commonly performed, visual acuity assessment requires both skill and judgment. The student will become accomplished at this task. Credit: 1.0, 1.0. *Staff*

OPTECH 154. Physiology and Anatomy of the Eye. This course will provide the student with knowledge on the development and workings of the human eye. Credit: 1.0. *Staff*

OPTECH 155. Physical History. Students will learn to associate pertinent physical history to ocular history. They will learn what part of the history is pertinent and how to elicit the information in an efficient, caring manner. Credit: 1.0. *Staff*

OPTECH 156. Cardiopulmonary Resuscitation. CPR is required for certification as an ophthalmic technician. Credit: 1.0. *Staff*

OPTECH 158, 158L. Optics and Refractometry. The physics of optical systems including the eye and other lens systems along with the skills needed to adapt and evaluate those systems. Also the ability to assist the physician in prescribing glasses and contact lenses. Credit: 1.0, 1.0. *Staff*

OPTECH 159, 159L. Visual Fields. Testing of the patient's visual field is done mechanically, by computer and through other methods. Students will learn the value of the visual field and the most appropriate method for obtaining it. Credit: 1.0, 1.0. *Staff*

OPTECH 160. Medical Terminology. Learning medical vocabulary and abbreviations and when and how to apply them. Credit: 0.50. *Staff*

OPTECH 161, 161L. Spectacles. Learning to read the prescription on a pair of glasses or contact lenses including bi-focal power, prism power and direction. Troubleshooting problems with eye wear. Credit: 1.0, 1.0. *Staff*

OPTECH 162. Pharmacology. This course will familiarize the student with ophthalmic medications and systemic medications. The student will learn how medications affect the eye and interact with each other. Credit: 0.50. *Staff*

OPTECH 163, 163L. Glaucoma and Tonometry. In this course the student will learn to define and understand glaucoma. The student will become familiar with and learn to perform various glaucoma diagnostic tests. The student will learn to understand and explain glaucoma treatments including medications, lasers and surgeries. Credit: 1.0, 1.0. *Staff*

OPTECH 164. External Ocular Diseases. The student will learn about diseases of the eyelids, orbits and lacrimal system. The student will become proficient at performing diagnostic tests to help the physician evaluate for and determine the severity of external ocular diseases. Credit: 1.0. *Staff*

OPTECH 165. Physiology of Systemic Diseases. Systemic diseases have a myriad of eye complications. The student will learn what connections systemic diseases have on the eye and when and how to test for them. Credit: 0.50. *Staff*

OPTECH 166, 166L. Contact Lens and Keratometry. In this course the student will learn the relationship between eye shape and contact lens fitting. The student will learn what testing should be done and how to perform the appropriate tests. Credit: 1.0, 1.0. *Staff*

OPTECH 167, 167L. Ocular Motility. The student will learn about the muscles associated with the eye. They will learn how the eye is moved by the muscles and how to test for eye misalignment. Credit: 1.0, 1.0. *Staff*

OPTECH 168. Neuro-Ophthalmology. This course will describe which cranial nerves are responsible for specific eye movements. The student technician will learn to test for specific anomalies and to quantify defects. The student will become familiar with the relationship of the brain to the eye. Credit: 1.0. *Staff*

OPTECH 169. General Psychology. The student technician will learn some basic psychology which will assist in handling patients in various situations. The student will learn techniques to diffuse difficult situations and patients. Credit: 0.50. *Staff*

OPTECH 170. Clinical Rotations. Credit: 30.00. *Staff*

TOTAL Credit Hours: 54.75

General Information for Students



Student Life

Conduct of Students

Duke University expects and requires of all its students' cooperation in developing and maintaining high standards of scholarship and conduct.

All students are subject to the rules and regulations of the university which are currently in effect or which, from time to time, are put into effect by the appropriate authorities of the university.

Any student, in accepting admission, indicates the willingness to subscribe to and be governed by these rules and regulations and acknowledges the right of the university to take such disciplinary action, including suspension and/or expulsion, as may be deemed appropriate for failure to abide by such rules and regulations or for conduct adjudged unsatisfactory or detrimental to the university.

Living Accommodations

Duke offers a residential apartment facility in which graduate and professional students live. The apartments are within short walking distance of university bus service. All apartments are air-conditioned, fully furnished, and utilities (heating/cooling, electricity, water, internet) are included. Licenses to occupy space in these facilities are issued for the academic year. For more information, please contact housing, dining, and residence life at housing@studentaffairs.duke.edu.

Requests for Duke University housing may be submitted after you have been admitted and have returned the official acceptance form. Students may apply online at <http://studentaffairs.duke.edu/hdrl>. Space is limited, and all students who intend to request housing are encouraged to apply early. In recognition of the special needs of newly accepted international students, priority for assignment to graduate and professional student housing will be awarded to those students arriving from abroad on student visa status.

Duke Community Housing is an off-campus rental housing resource for graduate students. Staff members are available to answer questions concerning housing needs and maintain a database of rental properties, accessible via the Internet at <https://offcampushousing.duke.edu/>. For more information, contact Duke Community Housing at (919) 684-4304 or e-mail housing@studentaffairs.duke.edu.

Application Procedures

Information about graduate and professional student housing and an online application can be found at <https://studentaffairs.duke.edu/hdrl>. In recognition of the unique challenges that face newly accepted international students, priority for assignment to graduate student housing is awarded to students who arrive from abroad on student visa status. Due to limited availability of space, assignment to university housing cannot be guaranteed.

Communication Between Duke University and Students

Electronic mail (e-mail) is the official medium by which Duke University School of Medicine communicates policies, procedures, and items related to coursework or degree requirements to students enrolled at the university. All students matriculated at the university are assigned a Duke University e-mail account upon acceptance of an offer of admission. It is the student's responsibility to check this e-mail account regularly and to respond promptly to requests made by e-mail.

Off-Campus Housing

Duke Community Housing is a resource to locate off-campus rental housing options in the Durham area. Duke Community Housing maintains a database of available rental housing which is accessible through the Housing, Dining and Residence Life (HDRL) website, <https://offcampushousing.duke.edu/>. The Duke Community Housing office is located at 218 Alexander Avenue, Apt. C.; (919) 684-4304; housing@studentaffairs.duke.edu. Office hours are 8:30 a.m. to 5 p.m. Monday through Friday. Appointments are recommended to meet with staff.

Dining Facilities

Duke Dining Services offers a variety of ways to tempt and please any palate. They offer stacked deli sandwiches, hand-cut steaks, or salads that are prepared with locally grown greens. Their goal is to provide a healthy and enjoyable experience, no matter where you dine on Duke's campus. For more information about campus dining options, contact Dining Services at (919) 660-3900; <http://studentaffairs.duke.edu/dining>.

Food and Other Expenses

Duke is home to one of the most innovative, dynamic, and cutting edge collegiate dining programs in the country offering over 50 dining options. Their mission is to provide a delicious, nutritious, affordable community dining experience, no matter where you choose to eat on campus. Whether you have a craving for a stacked deli sandwich, hand-cut steak or salad with locally grown greens, Duke Dining offers a variety of ways to tempt and please any palate. Duke Dining's Merchant-on-Points program expands student choices to a variety of off-campus vendors that deliver to residence halls on all meal plans. Whether it's late at night or you just need a change of pace,

these merchants are ready to deliver. Also, keep an eye out for food trucks! Please visit <http://dining.duke.edu> for locations, menus & hours and dietary and nutrition information.

The Duke University identification card, the DukeCard, serves as official identification for activities such as library book checkout, recreational center, parking gate, and academic building access. The DukeCard is also the means of accessing the Dining and Flexible Spending (FLEX) Accounts. These two prepaid accounts allow students to make purchases with their DukeCard at certain Medical Center and campus Dining Services locations, retail stores, photocopiers, vending, and laundry machines. The Dining and FLEX Accounts may also be used to purchase pizza and sub sandwiches delivered to campus from several approved off-campus merchants. A FLEX Account can be opened via cash or check at the DukeCard Office located in the Medical Center Parking Garage II. Additional deposits can be made at the DukeCard Office or by visiting any of the Value Transfer Stations located across campus and the medical center. The Dining Accounts can be activated at the DukeCard Office and will be billed to the student's bursar account. For more information about establishing an account, contact The DukeCard Office at (919) 684-5800; <http://dukecard.duke.edu>.

Motor Vehicle Registration

Each motor vehicle operated on Duke University campuses by students enrolled in the School of Medicine must be registered at the Medical Center Traffic Office, room 04230 Duke Clinics, (adjacent to Medical Center Bookstore) and thereafter must display the proper registration permit. Office hours: Monday-Friday 7:30 a.m.-3 p.m. 2010 Campus Drive office hours: Monday-Friday, 10 a.m.-3 p.m. (919) 684-PARK (7275); (919) 681-7746 (fax).

All students must pay an annual permit fee for a four-wheeled motor vehicle permit. Each motorcycle, motorbike, or motor scooter must be registered but carries no additional fee. Payment is accepted by bursar billing only. To register a vehicle, the student must provide the license tag number of each vehicle to be registered. Bicycles are registered free of charge at University Transportation Services, 2010 Campus Drive. (Fees were under review at time of publication.) Parking, traffic, and safety regulations are given to each student at the time of registration of the vehicle(s), and are subject to change. Students are required to abide by these regulations.

Services Available

Student Health Services (SHS) at Duke University is a joint program supported by the Division of Student Affairs and the Department of Pediatrics. A wide variety of services are available through SHS.

Student Health Center

The Student Health Center (SHC) is the primary location for health care services including general medical care, nutrition counseling, laboratory, pharmacy, (Duke Outpatient Pharmacy - 1st floor), travel and immunization clinics, and allergy/immunotherapy clinic. Most services are covered by the Student Health Fee (see below). Radiology studies, prescription drugs, some laboratory tests, and all specialty services received at the SHC are not covered by the fee. The SHC is located on Flowers Drive in the Duke Clinic complex (Duke South, sub-basement, Orange Zone). Medical services are provided by board-certified faculty physicians and by physician assistants, nurse practitioners, and resident physicians under faculty supervision. Students are seen by appointment 8:30 a.m. to 5 p.m. Monday, Tuesday, Thursday, and Friday and 9:30 a.m. to 5 p.m. Wednesday. Call (919) 681-9355 for an appointment. Limited walk-in services are also available on a daily basis. An Acute Care Clinic is held on Saturdays during the fall and spring semesters. Nurse advice is available at all hours when the SHC is closed. (HealthLink - (919) 966-3820). See <http://www.studentaffairs.duke.edu/studenthealth> for more information.

Students are encouraged to use the Student Health Center as their portal of entry to other health resources, including the specialty clinics within the general community and Duke University Health System. This helps with coordination of care. In the event of an obvious life-threatening emergency, students should go directly to the Emergency Department. If necessary, Duke Police (911 or (919) 684-2444) provides on-campus transportation to the Duke Emergency Department.

Nutrition Services

- Free individual nutrition counseling for current Duke students
- Nutrition consultations for special dietary needs (food allergies, intolerances, etc.)
- Personalized nutrition programs for groups, teams, dorms
- Consult services for planning events

Duke Student Wellness Center (DUWELL)

DUWELL fosters a living/learning environment that promotes and encourages the full development of the individual as an engaged member of the community. The staff helps students focus on an individual wellness perspective that integrates many areas of their life, including financial, social, spiritual, intellectual, mind-body, and environmental. Each of these dimensions of wellness is essential in maintaining harmony and balance in our lives. See <http://www.studentaffairs.duke.edu/duwell> for more information on topics including fitness assessment, alcohol and other drug usage, sexual activity and sexually transmitted diseases, stress management, and others.

Confidentiality

Information regarding the physical or mental health of students is confidential and is released only with the student's permission except in life-threatening circumstances. As a member of the Duke University Health System, the Student Health Center is fully compliant with HIPAA federal regulations.

Student Health Fee

All currently enrolled full-time students and part-time degree candidates are assessed a mandatory Student Health Fee each semester. This covers most services delivered within Student Health. Students not enrolled in the university for medical, judicial, or personal reasons are not eligible to pay the health fee or receive services normally covered by the fee. The health fee may be waived under certain conditions. A waiver can be granted if the student resides more than fifty miles away from campus and does not come to campus for research or other academic activity for the entire semester. Students studying at the Duke Marine Lab are not eligible for waiver. Duke employees and spouses of employees who are also students may request waiver. An optional summer health fee for students not enrolled in summer sessions is also available.

Services Covered by the Student Health Fee. The health fee covers most of the services at the Student Health Center if medically indicated and ordered by a student health provider. These include

- medical care for acute and chronic illness and minor injuries;
- complete physical exams;
- gynecological exams;
- laboratory services performed at Student Health: CBC, urinalysis, rapid tests for strep throat, mononucleosis, vaginitis, pregnancy;
- administration of allergy/immunotherapy shots;
- nutrition consultation;
- health promotion services provided by DUWell staff;
- services provided by Counseling and Psychological Services (CAPS); and

Services not Covered by the Health Fee. If unsure whether a service is covered, students should ask the Student Health reception staff in the clinic prior to receiving the service. Students are financially responsible for the following:

- prescription drugs
- laboratory studies not list above
- x-rays and other radiology studies
- medical care provided in the Emergency Department, hospital, or other nonstudent health facility
- care provided by specialist consultants, including those working within the Student Health facilities
- dental care
- tests, procedures, and prescriptions not medically indicated, not on the approved list, or not ordered by Student Health providers
- immunizations/titers required for matriculation and travel

Duke Student Medical Insurance (SMIP)

New Students

Students are asked to monitor their Duke e-mail inbox since an e-mail from Anna Kenyon will be sent to them asking them to either enroll in the student medical insurance or waive it since an insurance charge will be added to all students' bursar account for the Duke Student Medical Insurance Plan (Duke SMIP). During Open Enrollment between mid-June until September 15, 2015, students who have their own medical coverage will be able to submit

an online waiver. (KAISER PERMANENTE IS NOT WAIVABLE). In the e-mail a link will be provided to either enroll or waive the student medical insurance. If the intention is to waive the student medical insurance please take a moment to review the following waiver criteria below.

Students may waive the Duke SMIP if the following criteria are met:

- The student does not hold a F1 or J1 visa.
- The claims administrator is based in the United States, has a US telephone number and address for submission of claims, and the insurance policy has not been issued outside the United States.
- The policy is not a traveling policy.
- The plan provides both emergency and nonemergency health care and mental health benefits in the Durham area benefits in the Durham, North Carolina, area.
- Out of state Medicaid and state Children's Health Insurance Plans do not cover non-emergency care in Durham.
- The plan has participating hospitals, physicians, pharmacies, and mental health providers in the Durham, North Carolina, area to include Duke Medicine.
- The plan provides inpatient and outpatient mental health care (with at least thirty visits per year) and chemical dependency benefits are comparable to the coverage provided by the Duke SMIP.
- The plan provides coverage for prescription medication.
- The lifetime benefit is at least \$500,000 or more.
- The policy does not have a pre-existing condition waiting period.

If you have any questions please contact Kelan Beacham, Student Medical Insurance Manager at beacham@duke.edu.

Please contact your insurance carrier to inquire if Duke University Health Systems and physicians (Private Diagnostic Clinics) known as Duke Medicine are in-network for non-emergency care.

If the Duke SMIP is waived, the student or guardian is responsible for any medical bills that occur and are not covered by your insurance. Please contact your insurance company for specifics on benefits. Duke Student Health employees are not able to determine your out-of-pocket cost and are not able to negotiate with Duke Medical Center's billing services on your behalf.

International Students

If you are an international student holding a F1 or J1 Visa, enrollment in the Duke Student Medical Insurance Plan is mandatory. Follow directions to enroll. Please note that neither traveling insurance nor medical insurance policies issued from your country of origin or outside the U.S. or Canada will be accepted as a means to waive the Duke SMIP.

Returning Students

If you have waived before and your insurance has not changed you are going to be able to waive early during our early open enrollment by the second week of May 2014. Anna Kenyon will begin sending e-mails to everyone who waived last fall to their Duke e-mails asking to waive again. Please wait for her e-mail before calling since the phone lines will be very busy.

Counseling and Psychological Services

Counseling and Psychological Services (CAPS) is located in Suite 214, Page Building on West Campus. CAPS, a department of the Division of Student Affairs, provides a range of counseling, psychological, and psychiatric services to assist Duke students with concerns ranging from adjustment difficulties to clinical issues such as depression and anxiety.

In addition, CAPS offers a series of programs, support groups, and life-skills workshops. Recent offerings have focused on stress, anxiety, interpersonal relationships, meditation, eating and body image concerns, and grief support.

Another function of CAPS is to provide consultation regarding student development and mental health issues affecting not only individual students but the campus community as a whole. The staff works with other campus personnel including administrators, faculty, the student health staff, and student groups in meeting needs identified through such liaisons.

The professional staff is composed of psychologists, clinical social workers, and psychiatrists experienced in working with university students. They provide direct services to students including individual evaluation and brief

counseling/psychotherapy, couples counseling, group therapy, and psychiatric assessment with medication management. CAPS addresses a wide range of students concerns, including issues such as self-esteem and identity, depression, anxiety, family relationships, academic performance, dating, intimacy, and sexual concerns. Ordinarily, students are seen for counseling by appointment. If a concern requires immediate attention, an on-call consultant is always available during business hours for telephone or face-to-face consultation.

Contact CAPS at (919) 660-1000 or visit <http://studentaffairs.duke.edu/caps>.

Student Personal and Professional Advisory System for MD Program Students

The advisory dean system is the heart of the Office of Student Affairs. Working as a team with other OSA staff members and an academic resource consultant, the four advisory deans are responsible for the academic, personal, and career advising of Duke medical students. Each incoming student is assigned to an advisory dean and will work closely with that dean over time to maximize the potential of the Duke curriculum for his or her individual needs and career goals, to gain access to resources the student needs for his or her professional development, and to have a confidential advisor for any matter. Students are welcome to seek help from any of the four advisory deans, and will also work with advisors in different medical specialties to develop their plan for residency. In addition to individual student advising, the Office of Student Affairs organizes lunch group discussions in the first year and a variety of seminars regarding curriculum planning, residency application and professional development throughout medical school, and coordinates major events (Orientation, Match Day, Graduation) in the life of the school. Advisory deans also serve on any institutional committee that oversees the interest of the students.

Resources for Study

The goal of Duke University School of Medicine is to provide leadership in fulfilling its core missions which are

- to provide the most advanced and comprehensive education possible; to prepare our students and trainees for lifetimes of learning and careers as leaders, practitioners, or researchers;
- to perform biomedical research producing discoveries that add to understanding life processes and lead to preventing and curing disease and maintaining health;
- to translate, to practice, and to make available to the public, with compassion, the benefits of the unique clinical and technological resources of the School of Medicine and to support our educational and research missions; and
- to the maximum extent possible, we will apply our core missions in education, research, and health care delivery to develop the means to solve regional and national health care problems, including providing accessible, cost-effective health care of measurable quality.

Library

The Medical Center Library & Archives provides the services and collections necessary to further educational, research, clinical, and administrative activities in the medical field. Services are available to Duke Medicine faculty, staff, and students in the School of Medicine, School of Nursing, allied health programs, and graduate programs in the basic medical sciences. The library also serves the Duke University Health System.

More than 183,513 volumes and approximately 4,391 electronic biomedical journal titles are available. Our bound print journal collection and most books published before 1995 are stored in the Duke Library Service Center located off Briggs Avenue. More current print books are kept within the library facility. Scanned copies of journal articles may be requested for free by Duke Medical Center personnel through our Document Delivery/Interlibrary Loan Services. The Frank Engel Memorial Collection consists of a small group of books on health and nonmedical subjects for general reading, together with some newspapers and popular magazines.

Library services include reference, in-depth consultations, expert searching of databases, customized and individual group training, online tutorials, circulation, and document delivery services. Workstations for searching databases and the online catalog are available on Level 2R and Level 3 of the library, along with a variety of study spaces. A computer classroom for hands-on training is located on Level 1. Archives provides access to its collections for scholarly research and administrative work and can assist individuals in locating specific information, photographs, and documents concerning the history of the medical center.

The Medical Center Library & Archives is located in the Seeley G. Mudd Building, above the Searle Center and connected to the Trent Semans Center for Health Education. Detailed information on services and resources may be

found online at <http://mclibrary.duke.edu>. Additional information about Archives can be found at <http://archives.mc.duke.edu>.

Medical Center Library & Archives Hours: The Library is open to the general community as well as Duke University faculty, staff, and students during weekday hours (7:30 a.m. to 6 p.m.). ID card/badge access is required after 6 p.m. during weekday hours and all day on weekends. Twenty-four-hour card access is available for Duke Medicine badge holders only. The Reading Room and book collections are available Monday-Friday: 8 a.m.-11:30 p.m.; Saturday: 12 noon-8 p.m.; Sunday: 12 noon-12 midnight. The Library is staffed from 8 a.m.-6 p.m., Monday-Friday. Library staff are not available on the weekends.

Holiday hours are announced.

Associate Dean for Library Services & Archives: Patricia L. Thibodeau, MLS (Rhode Island, 1976), MBA (Western Carolina University, 1991).

Bookstore

The Medical Center Bookstore offers a wide selection of medical reference books, textbooks, software, and instruments to the Duke University Medical Community. Clothing, including scrubs and uniforms, office supplies, and Duke gifts are also offered. Special orders are welcomed. The store is located in Duke Clinic, lower level adjacent to the Food Court, 200 Trent Drive, Room 0001, Durham, NC 27710. The bookstore is open from 8:30 a.m. to 5:30 p.m. Monday through Friday. They are open on designated Saturdays specifically just prior to the start of a new semester. Please call (919) 684-2717 if you have questions concerning Saturday dates/hours.

Searle Conference Center

The Searle Conference Center for Continuing Education in the Health Sciences provides elegant accommodations for conferences, symposia, lectures, and meetings to support the continuing education activities of the medical center and university. Additionally, banquets, dinners, weddings, receptions, and other private events may be held on a space-available basis. Meeting space, audiovisual needs, catering, and assistance with event planning are all provided by the onsite staff. Accepting credit cards/procurement cards, IRs and other forms of payment. For information, call (919) 684-2244 or visit <https://duh.catertrax.com/> or <http://aramarkcafe.com/dukemed>.

Manager: Michael A. Evans

Conference Coordinator: Janet Kapp

Medical Center Commons

The Medical Center Commons restaurant is open for fine dining at lunch time Monday through Friday. Accepting credit cards/procurement cards, IR, Flex Account Cards, and reservations at (919) 684-5805, the Commons is located in the Searle Conference Center on the ground floor of the Seeley G. Mudd Building. The restaurant is a Bistro-style atmosphere with full table service/linen, china and flatware, features gourmet salads, fresh homemade salads, freshly prepared soups, and hot buffet selections. There are weekly specials. Prices range from \$10 to \$13. Private dining rooms are available as well as morning, evening, or weekend meeting and catering space. For additional information on these services, call (919) 684-2244 or visit <http://aramarkcafe.com/dukemed>.

Manager: Michael A. Evans

Medical Center Catering

Medical Center Catering is an in-house operation that provides catering services for the Duke Health System. We will deliver coffee breaks, lunch, and receptions to rooms within the North and South Hospital as well buildings accessible for push carts only (nonmotorized vehicles). We provide setup and breakdown paper/plasticware service. The hours of operation are 7 a.m. to 5 p.m. Monday through Friday. Call (919) 684-2904 for assistance or visit <https://duh.catertrax.com/> or <http://aramarkcafe.com/dukemed>. Accept credit cards/procurement cards, IRs, and other forms of payment.

Manager: Michael A. Evans

Conference Coordinator: Janet Knapp

The Office of Curricular Affairs

The Office of Curricular Affairs provides professional, technical, and administrative support for the development, implementation, and assessment of state-of-the-art medical education. The staff strives to support students and faculty throughout their participation in the educational program.

Under the leadership of Colleen O'Connor Grochowski, PhD, associate dean for curricular affairs and Edward Buckley, MD, vice dean for education, the Office of Curricular Affairs ensures education quality and innovation, alignment of educational goals and outcomes, assessment of student performance and analysis of course and program evaluations. The office also conducts educational research for the continual improvement of the curriculum and trains faculty in innovations in educational methodology and assessment.

In January 2013 the Mary Duke Biddle Trent Semans Center for Health Education (TSCHE) opened its doors to the first medical student classes. The new facilities for the educational program include the learning center, six state-of-the-art wet labs, numerous small group conference and classrooms for small group instruction, the Gross Anatomy lab, (still located in Duke South) and the Clinical Skills lab for teaching and assessment of clinical skills (described in more detail below). The TSCHE was designed specifically for state-of-the-art student-centered medical education.

Located on the third floor of the Seeley Mudd building and the fifth floor of the TSCHE, the Office of Curricular Affairs provides program support including initial course set-up; coordination for interdisciplinary, longitudinal courses and programs; all assessment and evaluation activities; laboratory set up and maintenance; standardized patient training; staff support for the Curriculum Committee, its standing subcommittees, and ad hoc task forces; maintenance of the curriculum management system, BlueDocs; liaison with Duke-National University of Singapore; and amenities for students including copying, faxing, and assistance with logistical requirements.

Clinical Performance Examination (CPX)

The CPX is a standardized patient exam which consists of nine individual patient encounters for which the student is in the role of primary provider. Some encounters will involve evaluating an undifferentiated physical complaint through a focused history and physical exam of a standardized patient. After these encounters, the student will write a patient note—similar to a SOAP note—on a computer. Other encounters involve patient counseling or screening. These encounters may be followed by brief test questions.

Cases are selected to sample a variety of dimensions including patient age, gender, all organ systems, and specialties represent through the clerkship year. The major purposes of the CPX are (a) to evaluate, in a more standardized way, each student's approach to patients with common complaints, demonstrating the orchestration of history-taking, physical examination and communication skills that cannot be adequately assessed through written tests, (b) to provide a measure of curriculum effectiveness and (c) to prepare students for Step 2 CS, a standardized patient-based assessment that is part of the physician licensing system in the United States. This preparation is achieved by giving students an experience that closely resembles the actual Step 2 CS.

Each student's encounters with standardized patients are videorecorded. Videorecordings are available for students to review. The CPX is structured to be competency-based, where each student's performance is compared to a predetermined standard. Each student receives a written report of their level of competence with each case, comments directly from standardized patients, and their individual performance scores as well as class performance scores for six major clinical skills. Passing the CPX is required for graduation.

Duke Hospital

Duke University Hospital, one of the largest private hospitals in the South, is part of Duke University Health System and currently has 957 beds. The mission and vision statements of Duke University Hospital are as follows:

Our mission is to put the person who needs our care at the center of everything we do. Our vision is to discover, develop, and deliver a healthier tomorrow.

Duke University Hospital, a tertiary and quaternary-care hospital, is consistently rated one of the top hospitals in the United States. It offers comprehensive diagnostic and therapeutic facilities, including a regional emergency/trauma center; a major surgery suite containing fifty-one operating rooms; an endosurgery center; an Ambulatory Surgery Center with nine operating rooms; and an extensive diagnostic and interventional radiology area. The facility also functions as a research hospital where medical advances are achieved and applied, and as a teaching hospital for students of medicine, nursing, and the allied health sciences. Approximately 40,000 patients are discharged and more than 50,000 surgical procedures were performed in fiscal year 2014.

Duke's home care, hospice, and infusion services provide opportunities for continued care of patients after they leave Duke Hospital.

Ambulatory services include the outpatient clinics, ambulatory surgery center, the employee health service, and the emergency department, with more than one million combined patient visits annually. The clinical faculty of the Duke University School of Medicine participate in undergraduate and graduate medical education and practice medicine in the hospital and in the Private Diagnostic Clinic.

Duke Hospital is approved for residency training by the American Medical Association, the Accreditation Council for Graduate Medical Education, and is accredited by the Joint Commission.

Veterans Affairs Medical Center

Since 1953, Durham Veterans Affairs Medical Center (DVAMC) has been improving the health of men and women who have so proudly served our nation. Services are available to more than 200,000 Veterans living in a twenty-seven county area of central and eastern North Carolina. The DVAMC is a 271-bed tertiary care referral, teaching, and research facility affiliated with Duke University School of Medicine. The DVAMC provides general and specialty medical, surgical, and psychiatric services. It serves as a major referral center for North Carolina, southern Virginia, northern South Carolina, southern West Virginia, and eastern Tennessee. In addition to the main facility in Durham, services are offered at the Health Care Center (HCC) located in Greenville, North Carolina, and two Community Based Outpatient Clinics (CBOCs) located in Morehead City and Raleigh, North Carolina. Outpatient Clinics are also located on Hillandale Road in Durham, in southern Raleigh, and at the Dialysis Clinic and Blind Rehabilitation Outpatient Clinic at Brier Creek in Raleigh. The medical center is a regional center for radiation therapy, neurological disorders, therapeutic endoscopy, and other special procedures. In addition, it serves as a referral center for high-risk open-heart surgery cases, angioplasty, and hemodynamic cardiac catheterization. The 100-bed Community Living Center (CLC) is reflective of an ongoing emphasis on wellness, preservation of functions, and rehabilitation. Special programs at DVAMC include a comprehensive Women's Health Center, a Home Based Primary Care program, a Telemedicine Home Care program, a Simulation Center, Geriatric Research Education and Clinical Center, the Center for Health Services Research in Primary Care, the VISN 6 Mental Illness Research Education and Clinical Center, and the Epidemiology Research and Information Center.

Lenox Baker Children's Hospital

Located just one mile west of the main Duke University Hospital Campus, [Lenox Baker Children's Hospital](#) provides outpatient services for children with genetic, metabolic, endocrine, and neurodevelopmental disorders. Physical and occupational therapy services are also provided.

Duke Regional Hospital

Duke Regional Hospital, a 369-bed acute care hospital, has served the healthcare needs of Durham, Orange, and surrounding communities since 1976. Duke Regional offers a comprehensive range of medical, surgical, and diagnostic services including weight loss surgery, orthopaedics, obstetrics, gynecology, cardiology, radiology, radiation oncology, emergency medicine, and outpatient surgery. Duke Regional features a level II Special Care Nursery, Duke Rehabilitation Institute and James E. Davis Ambulatory Surgical Center. Duke Regional is a Magnet Hospital designated by the American Nurses Credentialing Center. The hospital also earned The Joint Commission's Gold Seal of Approval™ for its Forward Motion joint replacement program and hip fracture program, as well as certification as a Primary Stroke Center.

Built on the tradition of caring of its predecessor hospitals, Lincoln and Watts. Duke Regional is proud to be part of Duke University Health System and remains dedicated to providing exceptional medical care with the personal touch and convenience only a community hospital can offer.

Duke Raleigh Hospital

Duke Raleigh Hospital offers the world-renowned resources of Duke Medicine conveniently located in Wake County. Duke Raleigh has been an important member of the Duke University Health System since 1998 and has served Wake County residents as a trusted health care resource for more than thirty-seven years.

Duke Raleigh is a 186-bed hospital providing a comprehensive array of services including a cancer center, cardiovascular services, orthopaedic and spine center, neurosciences, weight loss surgery, wound healing center, lifestyle and disease management, outpatient imaging center, intensive care unit, progressive care unit, pain clinic,

same day surgery center, emergency department and community outreach and education. Duke Raleigh Hospital has achieved Magnet™ designation for excellence in nursing by the American Nurses Credentialing Center. For more information, call (919) 954-3000 or visit www.dukeraleighhospital.org.

Other Hospitals

Various cooperative teaching and training programs are available for medical and allied health professional students and house staff at other hospitals to include Central Regional Hospital in Butner, North Carolina.

Medical Center and Health System Buildings and Facilities

The ninety-four buildings and additions which make up the medical education, research, and patient care facilities are located on approximately 200 acres, mostly on or near the West Campus of the Duke University.

The Clinic Zone is contiguous with the main quadrangle of the university and consists of the following: Duke Clinic-Ten contiguous buildings, including: *Clinic Reception Building*—Entrance lobby, clinics, food court, and amphitheater; *Edwin A. Morris Building*—Clinics, diagnostic, treatment, and support services, Department of Radiation Oncology administration, departmental research laboratories and offices; *Davison Building*—Department of Pathology administration, research laboratories and offices, Medical Center and Health System Administration, and School of Medicine Administration; *Original Hospital, 1940 and 1957 Additions*—Clinics, diagnostic, treatment, and support services including: clinical laboratories, physical therapy, pharmacy, departmental offices, and Student Health Clinic; *Baker House*—Department of Obstetrics and Gynecology administration, clinics, diagnostic, treatment and support services including: speech and hearing, pastoral care and counseling, departmental offices and Neuro-Oncology Program; *Barnes Woodball Building*—Psychiatry inpatient care unit, Clinical Research unit, diagnostic, treatment, and support services, outpatient pharmacy, preoperative screening, radiology, departmental research laboratories, and offices, and hospital administration; *Diagnostic and Treatment #3 Building*—Clinics, diagnostic, treatment, and support services, departmental research laboratories and offices; *Ewald W. Busse Building*—Center for the Study of Aging and Human Development, diagnostic, treatment, and support services, department research laboratories, and offices; *Eugene A. Stead Building*—General Clinical Research Center (Rankin), departmental research laboratories and offices; *Clinical Research II*—Department of Surgery offices, Department of Psychiatry administration, departmental research laboratories and offices, hyperbaric medicine unit. Other buildings within The Clinic Zone include *Marshall Pickens Building*—Clinics, Employee Health Services; *Parking Garage I*; and the *Cancer Center facility*: diagnostic, treatment, and support services.

The Hospital Zone consists of the following buildings: *Duke Hospital (Anlyan Tower and Ancillary Building)*—Inpatient care units, diagnostic, treatment, and support services including surgical suite, cath labs, emergency department, labor and delivery suite, operating and recovery suite, full-term nursery, radiology, clinical laboratories, respiratory therapy, pharmacy, the departments of anesthesiology, medicine, radiology, surgery administration, cardiology division offices; *MRI facilities and Brain Imaging and Analysis*; and *Children's Health Center*—Children's clinics, diagnostic, treatment and support services, Department of Pediatrics administrative offices; *Joseph A.C. Wadsworth Building (Eye Center)*—Department of Ophthalmology administration, clinic, diagnostic, treatment, and support services including: operating rooms, recovery, research laboratories and offices; *Albert Eye Research Institute*—Ophthalmology faculty offices and research space and Peds Ophthalmology Clinic; *Hudson Eye Building*—under construction; *Civitan Building* and *Child Development & Behavioral Clinic*—Clinics, laboratories and offices for the departments of pediatrics and psychiatry. *Hanes House* and *Clipp Research Facility*, Physician Assistant Program, Clinical Research Training Program, Community and Family Medicine, departments of medicine and surgery administrative and departmental offices, teaching facilities; *Christine S. Pearson School of Nursing (original construction and phase 2 expansion)*—School of Nursing offices and educational facilities; *Seeley G. Mudd Communications and Library*—Medical Center Library, Medical Center Commons, the Searle Center, Medical Education, Trent Center for BHHM, Cancer Center offices; *Parking Garage II*—House Staff and Student Exercise Facility, and Nursing Recruitment and the *Duke Medicine Pavilion*—Inpatient care units, diagnostic, treatment, and support services including operating and recovery, radiology, clinical laboratories, iMRI, and iCT suites; and the *Trent Semans Center for Health Education*—Central teaching facilities, School of Medicine admissions, registrar, and financial aid.

The Research Zone consists of the following: *Joseph and Kathleen Bryan Research Building for Neurobiology*—Department of Neurobiology administration, Alzheimer's Disease Research Center, neurobiology departmental research laboratories and offices; *Nanaline H. Duke Building*—departments of biochemistry and cell biology administration, departmental research laboratories and offices; *Alex H. Sands Building*—departments of anesthesiology,

biochemistry, cell biology, obstetrics and gynecology, pediatrics, medicine and psychiatry research laboratories and offices; *Edwin L. Jones Building*—departments of immunology and molecular genetics and microbiology administration, departmental research laboratories and offices; *Medical Sciences Research Building*—Duke Cancer Institute administration, departments of medicine, ophthalmology, pathology, pediatrics, radiology, radiation oncology, surgery, Cancer Center research laboratories and offices, and Howard Hughes Medical Institute administrative offices; *Clinical and Research Laboratory Building*—departments of cell biology, molecular genetics and microbiology, and medicine research laboratories and offices; *Leon Levine Science Research Center, section C*—Duke Institute for Brain Sciences, department of Pharmacology and Cancer Biology administration, research laboratories and offices; *Surgical Oncology Research Building*; *Environmental Safety Building*; *Research Park Buildings I, II, III and IV*—departments of anesthesiology, medicine, pediatrics, radiology, pharmacology, and surgery research laboratories, offices, and hospital clinic laboratories; *Vivarium & Surgical Research Pavilion*; *Cancer Center Isolation Facility*; *Snyderman Genome Science Research Building*; and *Genome Science Research Building-II*—genomic science research; *Medical Sciences Research Building-II*—departments of medicine, surgery and Duke Human Vaccine Institute (DHVI) laboratories and offices; and *Global Health Research Building*—DHVI laboratories and offices.

The West Zone consists of *the Lenox Baker Hospital*—Clinics, diagnostic, treatment, and support services, departmental offices, and mobile MRIs; *Dialysis Center*—treatment facility—Center for Living Campus—five buildings including *Sarah Stedman Nutrition Center*—Stedman Nutrition Center administrative offices and food facility; *Andrew Wallace Clinic Building*—Clinics, diagnostic, treatment, and support services and departmental offices; *PepsiCo Fitness Center*—Exercise facilities including indoor track, exercise equipment, swimming pool; *Aesthetic Services and Dermatologic Surgery Clinic*—Clinics, diagnostic treatment, and support services, and CFL administrative offices; and *Duke Integrative Medicine*—treatment facility.

The North Campus Zone consists of the following buildings: *North Pavilion*—Ambulatory Surgery center, Adult and Pediatric Bone Marrow Transplant, Duke Clinical Research Institute (DCRI), anesthesiology offices; and *2216 Elba Street—House of Healing*—small residence for families and patients; and *Elder Street Buildings*—diagnostic and treatment services, offices for the departments of pathology, psychiatry and medicine, the Center for the Study of Aging, hospital transport, and laboratory services, occupational and environmental safety, and medical center engineering and operation.

Graduate Program Information



Accreditation Council for Graduate Medical Education Programs

Appointments are from July 1 through June 30 with a few exceptions. Trainees receive competitive stipends and a comprehensive benefits package, including but not limited to professional liability insurance, disability insurance, life insurance, health insurance, parking, and uniforms.

Programs offered with the program training director of each service are as follows:

Adult Cardiothoracic Anesthesiology	Dr. Mark Stafford-Smith
Adult Reconstructive Orthopaedics	Dr. Michael Bolognesi
Allergy and Immunology	Dr. Joseph Roberts
Anesthesiology	Dr. John Eck
Cardiovascular Disease	Dr. Andrew Wang
Child Abuse Pediatrics	Dr. Aditee Narayan
Child and Adolescent Psychiatry	Dr. Gary Maslow
Child Neurology	Dr. William Gallentine
Clinical Cardiac Electrophysiology	Dr. Donald Hegland
Clinical Neurophysiology	Dr. Aatif Husain
Critical Care Anesthesiology	Dr. Christopher Young
Cytopathology	Dr. Rajesh Dash
Dermatology	Dr. Amber Atwater
Dermatopathology	Dr. Maria Selim
Diagnostic Radiology	Dr. Charles Maxfield
Emergency Medicine	Dr. Joshua Broder
Endocrinology, Diabetes and Metabolism	Dr. Thomas Weber
Family Medicine	Dr. Viviana Martinez-Bianchi
Foot and Ankle Orthopaedics	Dr. James Nunley
Gastroenterology	Dr. Andrew Muir
General Surgery	Dr. John Migaly
Geriatric Medicine	Dr. Mitchell Heflin
Geriatric Psychiatry	Dr. Mustafa Husain
Hematology/Medical Oncology	Dr. Carlos de Castro III
Hematopathology	Dr. Anand Lagoo
Hospice and Palliative Medicine	Dr. Katja Elbert-Avila
Infectious Disease	Dr. Gary Cox
Internal Medicine	Dr. Aimee Zaas
Internal Medicine/Pediatrics	Dr. Suzanne Woods
Interventional Cardiology	Dr. Michael Sketch
Joint Surgery and Thoracic Surgery	Dr. Thomas D'Amico
Medical Biochemical Genetics	Dr. Marie McDonald
Medical Genetics	Dr. Marie McDonald
Medical Microbiology	Dr. Barbara Alexander
Medicine/Psychiatry	Dr. Sarah Rivelli
Neonatal-Perinatal Medicine	Dr. Ronald Goldberg
Nephrology	Dr. Ruediger Lehrich
Neurological Surgery	Dr. Michael Haglund
Neurology	Dr. Saurabh Sinha
Neuromuscular Medicine	Dr. Vern Juel
Neuropathology	Dr. Roger McLendon
Neuroradiology	Dr. James Eastwood
Nuclear Medicine	Dr. Michael Hanson
Nuclear Radiology	Dr. Michael Hanson
Obstetric Anesthesiology	Dr. Cathleen Peterson-Layne
Obstetrics and Gynecology	Dr. Fidel Valea
Ophthalmology	Dr. Pratap Challa

Ortho: Sports Medicine	Dr. Dean Taylor
Orthopaedic Surgery	Dr. William Hardaker
Orthopaedics: Hand Surgery	Dr. Frasier Leversedge
Otolaryngology	Dr. Liana Puscas
Pain Medicine Anesthesiology	Dr. David Lindsay
Pathology – Anatomic and Clinical	Dr. Anand Lagoo
Pediatric Anesthesiology	Dr. John Eck
Pediatric Cardiology	Dr. Stephanie Wechsler
Pediatric Critical Care Medicine	Dr. David Turner
Pediatric Endocrinology	Dr. Michael Freemark
Pediatric Hematology-Oncology	Dr. Susan Kreissman
Pediatric Infectious Diseases	Dr. William Steinbach
Pediatric Nephrology	Dr. John Foreman
Pediatric Pulmonology	Dr. Deanna Green
Pediatric Radiology	Dr. Donald Frush
Pediatric Rheumatology	Dr. Heather Van Mater
Pediatrics	Dr. Betty Staples
Plastic Surgery	Dr. Michael Zenn
Plastic Surgery - Integrated	Dr. Michael Zenn
Preventive Medicine	Dr. Dennis Darcey
Primary Care Sports Medicine Fellowship	Dr. Tracy Ray
Psychiatry	Dr. Jane Gagliardi
Pulmonary Diseases/Critical Care Medicine	Dr. Scott Shofer
Radiation Oncology	Dr. W. Robert Lee
Rheumatology	Dr. Lisa Criscione-Schreiber
Sleep Medicine	Dr. Aatif Husain
Surgical Critical Care	Dr. Steven Vaslef
Thoracic Surgery	Dr. Thomas D'Amico
Transplant Hepatology	Dr. Andrew Muir
Undersea and Hyperbaric Med.-Prev. Med.	Dr. John Freiburger
Urology	Dr. Andrew Peterson
Vascular Neurology	Dr. Larry Goldstein
Vascular Surgery	Dr. Mitchell Cox
Vascular/Interventional Radiology	Dr. Paul Suhocki

Duke University Hospital is a participating member of the National Resident Matching Program, Washington, DC. All applicants for first-year, post-medical school appointments must register with this program.

The Durham Veterans Administration Medical Center adjoins the Duke University campus and is affiliated with Duke University Medical Center. Currently, approximately one-half of Duke University Hospital's training programs rotate to the Durham VA, which includes approximately one-third of our Graduate Medical Trainees.

Duke Graduate Medical Education Employment Requirements

The qualifications for membership to the Associate Medical Staff (Graduate Medical Trainee) eligibility areas follows:

- Graduates of medical schools in the United States and Canada accredited by the Liaison Committee on Medical Education (LCME)
- Graduates of colleges of osteopathic medicine in the United States accredited by the American Osteopathic Association (AOA)

- Graduates of medical schools outside the United States and Canada who meet one of the following qualifications:
 - Have received a currently valid certificate from the Educational Commission for Foreign Medical Graduates
 - or
 - Have a full and unrestricted license to practice medicine in a US licensing jurisdiction.
 - Graduates of medical schools outside the United States who have completed a Fifth Pathway program provided by an LCME accredited medical school
 - Have a Full State License or Resident Training License (RTL)
 - Official medical school transcript with conferred or graduated
 - A completed Postgraduate Training Verification Form (if applicable)
 - Current ACLS/BLS/PALS certification
 - Proof of identity and US Employment Eligibility (I-9) via E-Verify (See: I-9 Form Policy) including SS card
 - Health Record Clearance, which includes drug screening
 - A signed Agreement of Appointment
 - The signed Graduate Medical Education Agreement of Appointment is not effective, and employment will not commence, until all credentialing documents have been received and approved by the Office of GME and all requirements for hire have been satisfied.
 - Application for Appointment (which requires two reference forms, criminal background check, National Practitioner Databank check, EPLS check, OIG check, and ECFMG check for JMG's.)
 - Completion of all required online safety training
 - Completion of several payroll forms which include:
 - Duke Insurance Beneficiary Form
 - Health/Dental/vision Enrollment Form
 - Reimbursement Accounts Enrollment Form (if applicable)
 - Acknowledgment Form
 - Foreign National Form (if applicable)
 - Completion of all require Online Safety Training Modules and GME Learning Modules (See: Online Safety Training Modules) (Completed after Hire)
 - USMLE (or equivalent) Transcript
 - Document passing scores in the first two parts of appropriate medical licensure examinations (USMLE Step 1, Step 2CK, and Step 2CS (if applicable, COMLEX, or equivalent Canadian examinations, etc.) After 24 months of post graduate training documentation of passing all three parts of the licensing examinations must be provided.
 - This policy applies to all graduate medical trainees whether United States or International Medical School graduates. Programs have the right to impose more stringent requirements, but no less than those contained in this policy. An Agreement of Appointment will not be valid without satisfying this requirement. (*USMLE statment if trainee has not passed Step 3)
 - Attend Institutional Orientation
- A trainee may begin his/her clinical duties when he/she has met the above GME requirements.

Auditing of Courses by House Staff

Residents and fellows at the medical center may audit courses through the undergraduate and graduate divisions of Duke University by obtaining the written permission of the course instructor and the dean for continuing studies and by paying the current audit fees. House staff members are not permitted to take courses offered through the School of Medicine. For more information, please contact Dr. Paula E. Gilbert, Academic Dean for Continuing Studies, The Bishop's House, Duke University, Durham, NC 27708, (919) 684-2621; pgilbert@duke.edu; www.learnmore.duke.edu/academics/auditing.

International Medical Graduates (IMG)

An international medical graduate is a physician who received their basic medical degree or qualification from a medical school located outside the United States and Canada. Citizens of the United States who have completed their medical education in schools outside the United States and Canada are also considered international medical graduates. They must hold a valid certification from the Educational Commission for Foreign Medical Graduates (ECFMG) for admission to and participation in training programs. For information on ECFMG and the examination requirements, physicians must write to ECFMG, 3624 Market Street, Philadelphia, PA, 19104, or visit the website at <http://www.ecfm.org/>.

Physicians who are not United States citizens or lawful permanent residents and who need visa sponsorship must also contact this organization. ECFMG is the sole organization authorized to sponsor physicians for clinical training in J-1 exchange visitor status. No other J-1 program is permitted to sponsor physicians in clinical training. Physicians who have passed additional exams and hold additional qualifications may qualify for visas other than the J-1.

Applicants should send applications directly to the department or training program. For program information and online applications, visit the Office of Graduate Medical Education website at <http://www.gme.duke.edu/>. Please note: an application from an IMG that does not include a copy of a valid ECFMG certificate, or other evidence from ECFMG confirming passage of all of the required exams, is considered incomplete and may be discarded without further notice to the applicant.

For additional information regarding international medical graduates, please visit the Duke Visa Services website at <http://www.visaservices.duke.edu>, or e-mail visahelp@mc.duke.edu.

Continuing Medical Education



The mission of the Continuing Medical Education (CME) Program is to assist health care professionals in the translation, diffusion, and application of evidence-based knowledge to specifically improve clinical care and enhance patient safety. The CME program seeks to distill complex research and medical information into formats useful to physicians, scientists, and health care workers to promote implementation of that information in the health care setting. The Duke University Office of CME certifies and seeks to certify all types of activities: live presentations, online education, simulation, medical games, and enduring materials (monographs, DVD, etc). The Duke University Office for CME also collaborates to offer joint certification of educational programs inclusive of nursing, pharmacy, and healthcare executives in addition to physician credit.

To obtain a listing of current CME activities, to request CME credit for a meeting, to view your Duke CME transcripts, to fill out a disclosure form, or to contact a staff member, please visit <http://cme.mc.duke.edu>. You may also contact Duke Office of Continuing Medical Education, Duke Clinical Research Institute, 300 W. Morgan Street, Suite 800, Durham NC 27701; (919) 401-1200; dcricme@dm.duk.edu.

Index

A

Academic Calendar, Dr. of Medicine 39
Academic Calendar, Master of Management in Clinical Informatics 184
Academic Calendar, MD program 65
Academic Dismissal Policy of the Duke University School of Medicine 39
Academic Freedom 55
Academic Regulations, Master of Management in Clinical Informatics 185
Academic Standards, School of Medicine 55
Accommodations, living accommodation 241
Accreditation Council for Graduate Medical Education Programs 251
Administration 8
Administration, Duke Medicine and Duke University Health System 8
Administration, General University 8
Administration, School of Medicine 9
Administration, Standing Committees of the Medical Center Academic Administration 10
Admission
Dr. of Physical Therapy 144
MD Program 24
Admissions
Medical Scientist Training Program 77
Admissions Procedures
Clinical Leadership Program 190
Admissions, Master of Management in Clinical Informatics 184
Advanced Placement, MD Program 26
Advisory System (student personal and professional) for MD Program Students 245
Alpha Omega Alpha Medical Honor Society 62
Alumni Association, Duke Medical Alumni Association 63
Anesthesiology, courses in 85
Anesthesiology, Surgery & Environmental Physiology 133
Application Procedures
MD Program 24
re-application to MD program 27

Attendance Policy 42
Attendance Requirements for Medical Students for Holidays 42
Auditing Courses 42
Auditing of Courses by House Staff 254
Awards and Prizes for Medical Students 34

B

Basic Science Electives 133
Behavioral Neurosciences Study Program 133
Biomedical Engineering Study Program 134
Biomedical Sciences 162
Biostatistics Program 172
Bookstore, 246
Buildings and Facilities 249

C

Cancer Institute 15
Cardiovascular Study Program 135
Catering, Medical Center Catering 246
Clinical Core Courses 87
Clinical Leadership Program 189
Clinical Performance Examination 247
Clinical Psychology Master of Arts degree dual degree program 79
Clinical Research Institute 16
Clinical Research Study Program 134
Clinical Research Training Program, 196
Code of Professional Conduct, School of Medicine 55
Commencement 59
Communication Between Duke University and Students 241
Community and Family Medicine, courses in 87
Compliance/Safety Training 61
Conduct of Students 240
Continuation 48
Continuation of Research Study (CRS) 28
Continuing Medical Education 256
Cost of Education, MD program 27
Counseling and Psychological Services (CAPS) 244
Course Auditing 42
Course Evaluations. 43
Course Requirements, School of Medicine 71
Courses of Instruction, Master of Management in Clinical Informatics 187

Courses of Instruction, MD program 85
Curriculum Graphic 70
Curriculum Overview, Master of Management in Clinical Informatics 187
Curriculum, Dr. of Physical Therapy 152

D

Davison Society 63
Dermatology, courses in 91
Dining Facilities 241
Discrimination 4
Doctor of Medicine Degree 71
Doctor of Medicine Program 22
Doctor of Physical Therapy Program 143
Dual Degree Students, payment of tuition 29
Due Process Guidelines 43
Duke Raleigh Hospital 248
Duke Regional Hospital 248
Duke Student Wellness Center 243
Duke-NUS Graduate Medical School Singapore 15
Duty Hours Policy 43

E

Education Records/FERPA. 59
Employment Requirements, Duke Graduate Medical Education 253
Enrollment Status Definitions 28
Epidemiology and Public Health Study Program 135
Excused absences 38

F

Fail Grades for First Year of Medical School 44
Family Education Rights Privacy Act (FERPA) 59
Financial Aid
 Clinical Leadership Program 194
 Grants, MD program 33
 MD Program 32
 when Studying Away, MD Program 32
Financial Aid for International MD Students 32
Financial Assistance to Incoming First-Year Students 32
Financial Information, Master of Management in Clinical Informatics 185
Financial Information, MD program 27
Free Time 29, 91

G

General Information, 240
Global Health Institute 16
Global Health Study Program 137
Global Health, Master of Science/MD dual degree program 81
Grade Appeal Process 44
Grading Policy 45
Graduate Medical Education, 251
Graduation from Degree Programs 60
Gynecology, courses in 110

H

Harassment 4
Health Center, Student Health Center 242
Health Fee 243
Health Fee, services covered by 243
Health Insurance Portability and Accountability Act (HIPAA) 60
History 14
History of Duke University 21
History, School of Medicine 16
Hospital Zone 249
Housing Options 241
Human Genetics Study Program 137
Human Vaccine Institute 16

I

Immunization and Health Record, MD Program 62
Incomplete grade (I) 45
Independent Study (IS) 28
Interdisciplinary Courses 92
Internship Interviews 45

L

Leadership Education and Development (LEAD) Program 76
Leave of Absence, Dr. of Medicine Program 46
Leave of Absence, Medical, Dr. of Medicine Program 46
Lenox Baker Children's Hospital 248
Liberal Studies, Master of Arts degree in, combined program MD/MALS 80
Library Science Study Program 138
Library, Medical Center, 245

Living Accommodations 241
Loans, 33
Loans, Federal Stafford Student Loans 33

M

Master of Biostatistics Program 162, 172
Master of Health Sciences Degree Programs 189
Master of Management in Clinical Informatics 183
Master of Science of Library Science Study Program 138
Masters in Management in Clinical Informatics 138
MC/MPH dual degree program, 83
MD/JD dual degree program 83
MD/Master of Arts in Liberal Studies dual degree program (MD/MALS) 80
MD/MBA dual degree program 82
MD/MEng Dual Degree Program 84
MD/MHS in Clinical Research dual degree program 81
MD/MPP dual degree program 84
Medical Center Commons, 246
Medical Historian Program MD/PhD dual degree program 82
Medical Humanities Study Program 138
Medical Licensure 46
Medical Scientist Training Program, dual degree program 76
Medicine, courses in 96
Merit Awards for Medical Students 29
Microbiology, Infectious Disease and Immunology Study Program 139
Missing Grades 47
Mission of Duke University 2
Mission Statement for the Education of Medical Students 22
Molecular Medicine 139
Monthly Payment Plan, MD Program 31

N

Neurology, courses in 107
Neurosciences Study Program 141
Neurosurgery 109
Nutrition Services 242

O

Obstetrics and Gynecology, courses in 110
Office of Curricular Affairs 247

Ophthalmic Medical Technician Program 234
Ophthalmology and Visual Sciences Study Program 142
Ophthalmology, courses in 111
Optional Research Study (ORS) 28
Orthopaedics, courses in 112

P

Past Due Accounts, restrictions on 31
Pathologists Assistant Program, 203
Pathology Study Program 142
Pathology, courses in 113
Payment of Accounts 30
Payment Policy, non-US citizen 61
Pediatrics 142
Pediatrics, courses in 114
Physical Therapy Program, Doctor of 143
Physician Assistant Program 213
Policies for All School of Medicine Programs 55
Policy for Completion of Coursework in First Year 47
Primary Care Leadership Track 76, 142
Professional and Student Organizations 62
Professional Conduct 220
Program Policies, Dr. of Medicine 38
Promotion, MD Program 48
Psychiatry, courses in 120
Psychology, Master of Arts in Clinical Psychology dual degree program 79

R

Radiation Oncology, courses in 122
Radiology, courses in 123
Radiology, Radiation Oncology, and Medical Physics 134
Re-admission After Voluntary Withdrawal 48
Reciprocal Agreements with Neighboring Medical Schools 48
Refunds of Tuition and Fees, Dr. of Medicine Program 31
Registration of motor vehicles 242
Remediating Students, payment of tuitions 29
Replacement Diplomas 61
Retesting Policy - Examinations 49

S

Safety/Compliance Training 61
Satisfactory Academic Progress 50

Scholarships, internal scholarship programs 36
Searle Conference Center 246
Selection of applicants, MD Program 26
Services Available 242
Severe Weather Attendance Policy 61
Sexual Misconduct 4
Special Interdisciplinary Training Programs 133
Standing Committees of the Medical Center Academic
Administration 10
Student and Professional Organizations 62
Student Health Center 242
Student Health Fee 243
Student Life 240
Student Wellness 243
Study Away Courses 125
Study Away Policy 52
Studying Away, Financial Aid during 32
Surgery, courses in 125

T

Technical Standards, MD program 25
Testing policy 52
Thesis Course 133
Time Away Requests for Second Year Courses 52
Time Away, requests for 53
Transcripts 62
Transfer Students 26, 29
Tuition and Fees, MD Program 27

U

Unexcused absences 39

V

Veterans Administration Medical Center 248
Visiting Students 53

Z

Zones

Clinic Zone 249
North Campus Zone 250
Research Zone 249