Bulletin of

Duke University

School of Medicine

2018-2019

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Courtesy of Duke University, Les Todd, Bill Snead, Jared Lazarus, Marcie Ellis, Paula J. Alford, Lauren Dincher, Beky Branagan, and Sonja Boergmann

The information in this bulletin applies to the academic year 2018-2019 and is accurate and current, to the greatest extent possible, as of June 2018. 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 email 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 https://oie.duke.edu/. 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 Victoria Krebs, Associate Dean of Students in the Office of Student Conduct, at (919) 684-7336 or victoria.krebs@duke.edu. 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 email accounts as well as access to email services from public clusters if students do not have personal computers of their own. All students are expected to access their email 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 https://police.duke.edu/news-stats/clery 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/fpco/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.

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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

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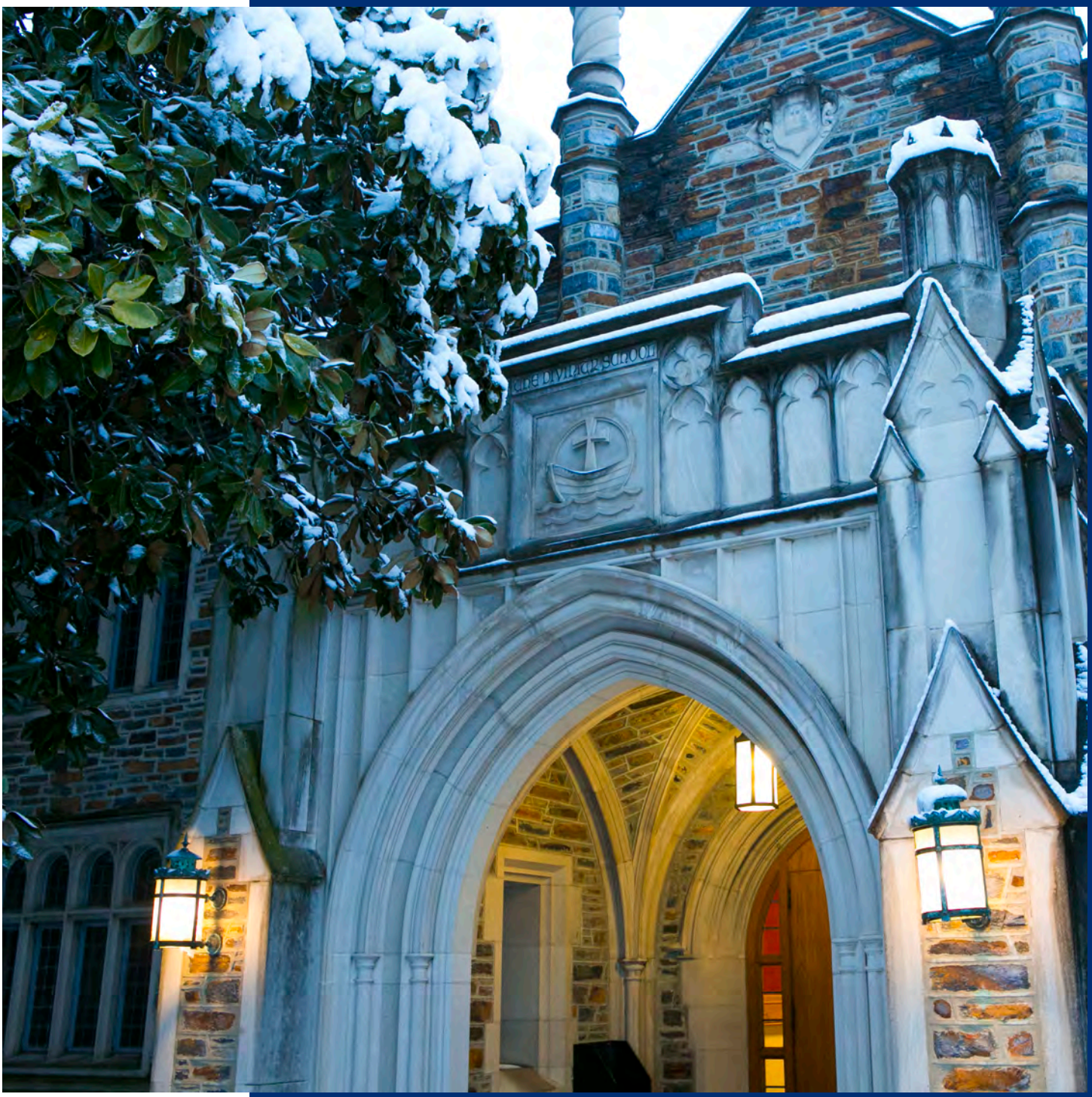

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History

Bill Snead

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 consistently ranks among the top ten medical schools nationally by US News & World Report and is ranked in the top ten for NIH funding among medical schools.

The school's unique curriculum allows students to 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 most of their peers. The School of Medicine incorporates a range of highly regarded educational programs including nationally regarded Physician Assistant and Physical Therapy programs, and boasts the research efforts of more than 2,300 basic science and clinical faculty. Their combined efforts make Duke one of the largest biomedical research enterprises in the country, with nearly $740 million in sponsored research annually. The School, along with the School of Nursing and Duke University Health System, create Duke Health.

In 2017, Duke Health launched the Translating Duke Health Initiative, a multi-disciplinary, multi-year commitment to harness the expertise and knowledge found at Duke to address society's most significant scientific and healthcare challenges and fulfill the vision of making discoveries and transforming health for millions. The five areas of focus are preserving and restoring cardiovascular health; enhancing brain resilience and repair; ending disease where it begins; controlling the immune system; and combating solid tumor brain metastases.

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 University School of Medicine

The School of Medicine comprises eight basic departments, fifteen 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-NUS Graduate Medical School Singapore

The Duke-NUS Medical School (Duke-NUS) in Singapore 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 opportunity for Duke to expand its global reach and research. The website for Duke-NUS Graduate Medical School Singapore is http://www.duke-nus.edu.sg.

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 a National Cancer Institute (NCI)-designated "comprehensive cancer center." The NCI-Designated Cancer Centers are recognized for their scientific leadership, resources, and the depth and breadth of their research in basic, clinical, and/or population science.

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 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 continues 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 multi-national 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.

Duke Forge

In 2017, Duke University created Duke Forge, a new center for health data science which aims to advance and create inter-campus collaborations focused on data science research and innovation in health and biomedical sciences. Based in the School of Medicine and led by Vice Chancellor for Health Data Science Dr. Robert M. Califf, a diverse team of scholars, clinicians, and experts spanning multiple disciplines across campus are working to motivate and inform efforts to improve health —from bench science to population health.

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.

Jared Lazarus

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.

2014: Neuroscience achievement

A mind-controlled robotic exoskeleton developed by Duke researcher Miguel Nicolelis, MD, PhD, is used by a paraplegic man to make a kick at the Opening Ceremonies of the World Cup.

2015: Nobel Prize

Dr. Paul Modrich receives the Nobel Prize in Chemistry for his groundbreaking research in DNA mismatch repair.

2016: Brain tumor treatment breakthrough

The FDA awards Duke "breakthrough therapy designation" for a poliovirus therapy for glioblastoma. The therapy was developed and is being tested by researchers at Duke's Preston Robert Tisch Brain Tumor Center.

2016: Major milestone in transplantation

A Duke team, led by Linda Cendales, MD, performed the first hand transplant in NC, attaching the limb to a 54-year-old patient from Laredo, Texas, whose hand was severed in a childhood accident.

2017: Eighth dean appointed

Mary E. Klotman, MD, becomes the dean of the School of Medicine.

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 250,000, 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

Marcie Ellis

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 among other health care professionals; the need for data scientists who can cull through the increasing amounts of data that are coming at an ever increasing speed; 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 the basic and clinical sciences 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 or pursue an additional degree;
- promotion of structured active learning that includes explicit experience in leadership, teamwork, and interprofessional education;
- mentorship of students by faculty in all facets of the learning process;
- implementation of a standardized and valid assessment of clinical competence, carefully and thoughtfully evaluating the acquisition of knowledge, skills, and attitudes appropriate to the future goals of each student;
- appropriate use of information technology in student learning, testing, 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. 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 are also 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 clinical education and patient care. This attitude involves consideration not only of speech and personal appearance but also of emotional intelligence, teamwork, selfless service, critical thinking, 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.

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 November 15 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 early-February of the application cycle.

Academic Expectations

Duke University School of Medicine strives to attract, educate, and nurture students who have extraordinary intellect compassion, humanism and compassion. We have consistently encouraged our applicants to have a broad and balanced undergraduate academic education as well as a wealth of life experiences. To accomplish this growth and maturation process, a rigorous, challenging, and interdisciplinary academic preparation in the sciences and humanities is of paramount importance.

Aligning with the recent discussions of the appropriate preparation for medicine (as described in the two part AAMC-HHMI Foundations for Future Physicians) and the changes made to the 2015 Medical College Admissions Test (MCAT), undergraduate expectations are now different than they were previously.

The new "academic expectations" are the result of extensive discussions among both the clinical and basic science faculty of the School of Medicine. The foundation of these expectations is based on competency-based, cross-disciplinary training in the traditional biomedical sciences-biology, chemistry, and physics as well as their link to formal training in medicine. Additionally, in conjunction with the traditional preparation of the biomedical sciences, the need to understand the larger psychosocial context in which medicine is increasingly practiced requires significant exposure to the social sciences.

Duke University School of Medicine acknowledges the rapid evolution of the biomedical sciences and the challenges that socially-driven disparities in medicine present. Those aspiring for clinical and research careers in medicine must be prepared in a much different manner to expertly address the ever-changing healthcare environment. The faculty of the School of Medicine, prompted by these new challenges, has created modifications to the curriculum to align our expectations for pre-medical preparation with this evolving academic environment of medical school.

MCAT Examination and Coursework Expectations

For those who are planning to apply to the School of Medicine at Duke University, our academic expectations will include multidisciplinary coursework in the following areas and completion of the MCAT examination. If possible, applicants should arrange to take the MCAT as early as possible in the year that they plan to apply. MCAT scores dated earlier than four years prior to the year for which an applicant is seeking admissions will not be considered. The latest examination scores accepted from the MCATs for the 2018-2019 application cycle must be from the August 2018 examination.

Biochemistry: May be fulfilled by a single course in Biochemistry, or through coursework which incorporates principles of Biochemistry as part of an interdisciplinary course in Cell and/or Molecular Biology and/or Genetics.

Cellular Biology: May be fulfilled by a single course in Cell and/or Molecular Biology and/or Genetics.

Statistics/Biostatistics: An understanding of the application of statistical methods in the analysis of data is expected given the increasing reliance on current biomedical and healthcare research as part of the curriculum.

Physics: An understanding of the correlation of basic physics to human physiology and anatomy (e.g. physics and/or biophysics) should be completed. Labs are optional.

Sociology: An introduction to the principles of social organization, with particular emphasis on the social determinants of healthcare is expected.

Psychology: An introduction to the basic principles of psychology with emphasis on the biological basis of behavior are recommended.

Expository Writing: Experience in expository writing across the humanities, including but not limited to formal courses in English, is a fundamental expectation in the preparation for medicine. This may be accomplished through coursework in a number of disciplines, including but not limited to Philosophy, History, Public Policy, Political Science, Religion, etc. and may be accomplished through an Honors Thesis or completion of a major research paper.

Understanding that the preliminary coursework leading up to the aforementioned cross-disciplinary courses, e.g. Biochemistry, Cell/Molecular Biology, etc., will vary among colleges and universities, the academic expectations as listed represent the absolute courses likely expected of matriculants to the School of Medicine. The preliminary courses may be acquired through traditional university courses and/or approved online course work. Applicants considering the use of online coursework should contact the Office of Admissions at Duke University if there are any questions about the suitability of online coursework for DukeMed.

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 July/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, re-applicants 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 $81,950 for a fourth year student to $85,772 for a first year student. These are estimated figures only. Tuition and fees are subject to change without notice.

2018-19 Estimated Cost of Education

Expense	Amount
Tuition	$59,100
Technology fee	$2,100
First year fees[1] (includes microscope rental, first year only)	$2,579
Annual cost of books and supplies: first year	$800
Annual cost of books and supplies: second year	$500
Annual cost of books and supplies: third and fourth years	$200
Rent, board, miscellaneous, and travel: first year (11 mos.)	$22,231
Rent, board, and miscellaneous: second year (13 mos.)	$26,273
Rent, board, and miscellaneous: third year (12 mos.)	$24,252
Rent, board, and miscellaneous: fourth year (8 mos.)	$18,189
Continuing Optional Research Study Fee[2] (per semester)	$500
Duke Parking Permit: car	$710

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 three 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

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

2 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.

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. ORS should be due to an extension of the third year research into a new area of investigation due to a change of career plans or a desire to enhance research skills, not to delay graduation. 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.

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 $500 for each semester or part of a semester away. 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. 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 are to be paid toward tuition.

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.

Edward Benenson Scholarship, established October 1984, by gift of Edward H. Benenson.

The Dean's Merit Scholarships: Dean's Merit Scholarships range in amount of one-fourth 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 one-fourth 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:

- **Leon Levine Scholarship (formerly 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.
- **Richard Finner Scholarship,** established November 2011, by Richard W. Finner.
- **William Orr Wagner,** established August 2006, by Amanda Wagner, Brett Wagner, Dale Harrison, Jeanne McKibben, and Cathy McClure in honor of William Orr Wagner.

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 bases 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.

Dudley Family Academic Scholarship, established September 2014 by Mary A. Dudley and Alden W. Dudley, Jr. This scholarship will cover full tuition to an incoming first year medical student based on academic excellence and whose life experiences and background will meaningfully contribute to the diversity of the class.

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. The application deadline for incoming students is April 1. Financial Aid eligibility is determined for all admitted students that meet the stated deadline, 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 DukeHub. You will receive an email each time a new bill is ready for you to view on DukeHub. Fall bills will be due on the first business day in August, and spring bills will be due on the fourth business day in January. 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, Cashiering Office, PO Box 90759, Durham, NC 27708. To ensure prompt credit to your student account, please include a copy of your bill when mailing your payment.

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 DukeHub. 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 for all required courses 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 87 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 $28 million. More than $14 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 once they have been admitted to the School of Medicine. 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.

Student's applying for need-based funding are required to complete the CSS Profile 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 emailed to the accepted applicant after receipt of the required forms. Application information can be found at: https://medschool.duke.edu/education/student-services/office-financial-aid/prospective-students.

Sources of Aid for International and Deferred Action Childhood Arrivals (DACA) 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/prospective-students.

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 and DACA 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 and the CSS Profile 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 April 30. 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

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.

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; however, usually a student can accept only one scholarship. 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 or the last working day before 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 (919) 684-5901 or renee.mahaffey@duke.edu.

External Research/Scholarship Programs

American Society of Hematology (ASH). Physician-Scientist Career Development Award. The Society's Physician-Scientist Career Development Award is an opportunity for medical students to gain experience in hematology research and to learn more about the specialty by immersing themselves in a year-long laboratory, translational or clinical investigation under the mentorship of an ASH member. The total amount of the award is $42,000. The award is comprised of $32,000 to support the trainee, a $4,000 research allowance for supplies, $4,000 for insurance and educational expenses (including one course), and $2,000 for meeting attendance. The award is for a one-year period, generally July 1 through June 30. Up to five (5) awards will be granted per year. Awards will be paid directly to the participating institution of the mentor, not to the mentor or the recipient. Indirect costs (i.e., facilities and administrative costs) are not allowed. Applications are due in January. Award notification is in March. For more information go to http://www.hematology.org/Awards/Medical-Student/400.aspx.

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. The application deadline is in January of each year. For more information, please contact Dr. Dennis Clements at https://globalhealth.duke.edu/doris-duke or go to the Doris Duke website at http://www.ddcf.org/what-we-fund/medical-research/goals-and-strategies/encourage-and-develop-clinical-research-careers/international-clinical-research-fellowship/.

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 in January of each year. Students receive an annual salary of $32,000. 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 https://www.hhmi.org/developing-scientists/medical-research-fellows-program.

Intramural Research Program at the National Institute of Environmental Health Science (NIEHS). Fellowships in Environmental Medicine are available. In the past, applications have been due before the end of January. 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.

National Institute of Health (NIH) Medical Scholars Program. This 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. The deadline for complete applications is in January. In 2018 student support will include a $36,000 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 or contact mrsp@mail.nih.gov.

The 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. Apply through the Consortia Programs—the deadline is early November. For more information, please visit https://www.vumc.org/vecd/ or contact the Hubert Yeargan Center for Global Health at Duke (hubert-yeargan@dm.duke.edu).

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 $32,000 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. The application deadline is in January.

Internal Scholarship Programs

Students applying for the Duke Internal Scholarships listed below should use the Internal Scholarship Application form. Most Internal Scholarships applications are due April 1, or the last working day before April 1. Announcements will generally be made the last working day of April. Completed applications should be emailed to renee.mahaffey@duke.edu.

Poindexter Scholars in Basic Sciences. The Poindexter Scholars in Basic Sciences Program is designed to encourage rising third year medical students to participate in research projects under the guidance of basic science faculty members in the School of Medicine. Scholars are awarded a $15,000 scholarship for a 10-month research experience. Funds will also be available for each Scholar to attend one national conference, approved by their research mentor, to present their work. This program is focused on basic science research, and priority will be given to those who identify laboratories in basic science departments. (This program is made possible through the generosity of Dr. John Poindexter, an alumnus of the School of Medicine.) For more information, contact raphael.valdivia@duke.edu.

The Donald B. Hackel Fellowship in Cardiovascular Pathology. This fellowship 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 10-month fellowship carries an annual stipend of $15,000. For further information contact Dr. William Bradford at bradf001@mc.duke.edu or Dr. David Howell at david.howell@duke.edu.

The Duke Clinical and Translational Science Institute (CTSI) 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. Applicant interviews will be conducted in April. In addition to the scholarship form, applicants must provide name, position/title and email address of 3 individuals (other than your primary mentor) who are knowledgeable about your accomplishments and/or research interests. CTSA applicants may also provide up to 2 extra pages of additional information to the proposed research program question in the application. For further information, contact stephanie.molner@duke.edu or go to https://medschool.duke.edu/education/student-services/office-student-affairs/third-year-medical-students/duke-internal.

Duke Institute for Health Innovation (DIHI) Clinical Research and Innovation Scholarship. The Duke Institute for Health Innovation is a platform and resource for Duke University and Duke Health faculty, staff, students and trainees to catalyze and advance transformative innovations in health and healthcare. The DIHI clinical research and innovation scholarship embeds students in ongoing research and innovation project(s) and requires that recipients contribute towards shaping, developing, implementation and evaluation of the project.

The student are expected to pose an original research question that pertains to the project, and must attend and lead team meetings. Scholarship decisions are made by early summer. For additional information, please see https://medschool.duke.edu/sites/medschool.duke.edu/files/field/attachments/dihi_scholarship.pdf or contact Suresh Balu (suresh.balu@duke.edu) or Mark Sendak (mark.sendak@duke.edu).

The Duke Clinical & Translational Science Institute (CTSI) Scholarship (Formerly DTMI). This is a scholarship funded by a Pfizer Foundation grant. CTSI scholars will complete one (1) year of mentored clinical research and the core Duke Clinical Research Training Program (CRTP) coursework curriculum. Upon successful completion of all requirements, CTSI scholars will receive the "Academic Core in Clinical Research" certificate. The scholarship provides CRTP tuition.

Applicants must complete the Internal Duke Scholarship Application form and submit by the application due date.

In addition to this application applicants must provide the following additional items:

- Name, position/title, and email address of three (3) individuals other than your primary mentor who are knowledgeable about your accomplishments and/or research interests.
- A brief description clarifying the applicant's role on the study.

Applicants may also provide up to two (2) additional pages of information to the proposed research program question in the application.

For further information, please contact stephanie.molner@duke.edu or go to https://www.ctsi.duke.edu/translational-training-workforce-development/ctsi-education-workforce-development-core/ctsi.

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 https://medschool.duke.edu/education/student-services/office-student-affairs/third-year-medical-students/duke-internal.

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 in October. For more information, go to 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+ percent 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, email Dr. Andrew Berchuck (andrew.berchuck@duke.edu).

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. For more information, email Dr. John Haney (john.haney@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 email 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 need-based 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 to which 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. If you need additional information, please contact the Office of Financial Aid.

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 (email 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 without approval of the Curriculum Committee.

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 Probation/Suspension Policy

Academic Probation places a student on notice that his or her academic performance or behavior has created considerable cause for concern and requires critical ongoing evaluation for a period of time. The probation period will be determined by the Vice Dean. It will allow sufficient time for correction and close monitoring of the student's performance. Academic Probation is noted on the academic transcript. If a student was placed on Academic Probation at the recommendation of the Promotions Committee and the student has satisfied all the conditions of the Academic Probation specified by the Vice Dean, the Promotions Committee can make a recommendation to the Vice Dean to have the student removed from this status. Upon approval by the Vice Dean, removal from Academic Probation status will be noted on their academic transcript.

If a student was placed on Academic Probation at the recommendation of the Promotions Committee and the student has not satisfied all the conditions of the Academic Probation specified by the Vice Dean, the Promotions Committee may recommend to the Vice Dean that the student be placed on Academic Suspension. The suspension is noted on the Academic transcript.

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.

Policy on 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:

1. 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
2. Declining to evaluate the performance or vote on the promotion of any student for whom one has provided clinical care, including psychiatric care or psychological counseling
3. Clearly communicating expectations, and applying consistent evaluation and grading methods which are communicated in advance of learner performance
4. Assigning tasks to learners based on their knowledge, skills and experience
5. Providing supervision and appropriate remediation when learners are not adequately prepared
6. Providing feedback to learners in a timely, constructive, personalized and explicit manner
7. Abiding by the Duty Hours Policy and other policies of the SOM
8. 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:

1. 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")
2. 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)
3. Using threatening or obscene gestures, cartoons, or jokes in the presence of a learner

4. 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")
5. Ignoring learners assigned to you or failing to complete assigned learner evaluations
6. 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)
7. 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 though words, gestures, and behaviors (e.g. inviting on a date, commenting repeatedly on attractiveness or clothing, making sexually suggestive comments or gestures)
8. 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)
9. 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)
10. 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)
11. Endangering the learner's professional development (e.g. telling learners to ignore institutional or school policy, inviting learners to do something unethical or illegal)
12. 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)
13. 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
- to the Duke University Office of Institutional Equity

Conduct that may be a violation of the university's Nondiscrimination Statement or 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. This body will serve 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:

1. 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.
2. 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.
3. 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, *behaviors that violate Title IX of the 1972 Education Amendments to the Higher Education Act, which include discrimination or harassment based on*

sex or gender, must be reported by any University official (except those designated as confidential—Student Health, CAPS, Ombudsperson, clergy acting in that capacity, and the Women's Center) to the Office for Institutional Equity so that they can be promptly acted upon in order to be compliant with Federal Law. Behaviors that pose an immediate danger to others (e.g. violence or threats of physical violence, illegal drug use by caregivers in the clinical setting, deliberate violation of patient safety procedures) or are illegal (e.g. stealing narcotics, falsifying patient records) must also result in immediate reporting so that action can be taken.

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 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 instructor and/or department may schedule the student to be on the wards until the end of their shift.

Clinical Activities by and Supervision of Medical Students

Medical students rotate in clinical settings to learn all aspects of patient care, including obtaining patient histories, performing thorough physical examinations, formulating differential diagnoses, learning to make decisions based on appropriate laboratory and radiological studies and procedures, interpreting results of special studies and treatment, communicating with patients on all aspects of disease and prognosis and communicating with members of the health care team. All patient care provided by medical students is provided under the supervision of a licensed health care provider performing activities within the scope of the health care provider's practice. An on-site licensed health care provider is always immediately available. To this end, the medical student may participate in the following activities:

1. Access patients to obtain a medical history, perform a physical exam, and follow the inpatient and/or outpatient course.
2. Access the patient's entire medical record, including laboratory reports, x-ray reports, etc.
3. Perform appropriately supervised procedures as authorized by the patient's health care provider. For procedures such as drawing blood that the student has been trained for and declared competent in, the student may draw blood and perform independent of direct supervision.
4. Perform only CLIA-waived laboratory studies under appropriate supervision and review.
5. When the student is clinically prepared, write orders for specific patients. All of the orders written by a medical student must be reviewed and countersigned by the responsible resident or health care provider.
6. Write progress notes under the supervision of the responsible health care provider.

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.

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. An incoming student will not be permitted to begin orientation and/or classes without consenting to a criminal background check and drug screening and receiving favorable reports.

Following enrollment, students are required to disclose if they have been charged with, arrested for or convicted of a misdemeanor or felony convictions, other than minor traffic violations including deferred adjudication, within one week (seven days) days of occurrence to the Vice Dean. Nondisclosure or falsification may be grounds for dismissal or degree revocation. Students already enrolled may, for good cause, be required at the request of the Vice Dean of Medical Education to undergo an additional CBC or drug test. 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 School of Medicine program and that the results will be shared with affiliating agencies that provide clinical experiences in the program.

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.
- 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

Email, Official Means of Communication

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

Emergency Management Plan Policy

The following link provides information pertaining to safety and emergency resources, to include disaster preparedness and preparation information for the Trent Semans Center, fire drill information for the Trent Semans Center, Duke Alert, and health and wellness resources: https://medschool.duke.edu/education/student-services/medical-education-administration/safety-resources.

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 Policy

Grading

Final course grades are available to students via DukeHub. A grading basis is established for each course with Curriculum Committee approval. Currently there are three grading schemes established: Pass (P)/Fail (F); Honors (H)/High Pass (HP)/Pass (P)/Fail (F); and Credit (CR)/No Credit (NC). Course Directors shall assign a grade to certify the student satisfactorily completed requirements. 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.

Fail Grades

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, and the student will be referred to the Promotions Committee for review. The Promotions Committee may recommend to the Vice Dean of Education that the student remediate the course prior to starting second year clerkships. Alternatively, when deficiencies in coursework are major or in multiple courses, the Promotions Committee may recommend an immediate delay in further progression in the curriculum and that the student repeats the entire course(s) the following year.

Incomplete Grades

It is recognized that students who encounter difficulty of an academic or personal nature may also find it necessary to delay completion of a course beyond the term of the course. At the course director's discretion, students with deficiencies in completion of course requirements or those who must delay completion due to reasons of illness or other extenuating circumstances may receive a grade of "Incomplete," to be submitted when the final grades for the course are recorded. The student must then initiate a formal request to complete the course requirements by meeting with the course director(s) and his/her Advisory Dean and completing a Request for Remediation form to be submitted to the Advisory Dean.

If a student has an unsatisfied "Incomplete" grade and/or a pending "Request for Remediation" that preclude completion of coursework in a timely manner or if the Promotions Committee in conjunction with the course director(s) determines that, despite an approved "Request for Remediation", the student is not adequately prepared to continue in the curriculum, an immediate delay in further progression may be recommended to the Vice Dean for education, even though no "Fail" grade has been recorded.

Upon completion of the course requirements a grade is added; however, a note of the Incomplete (I) remains on the official transcript. If the student is unsuccessful in satisfactorily completing course requirements or does not enact the remediation by the agreed upon deadline, a grade of "Fail" is recorded.

A grade of Incomplete ("I") is reported while a retake of an exam is pending. Any second year student permitted a retest in a course due to failure is not eligible for a grade of "H" Honors.

Withdrawal Grades

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.

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.

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 on the USMLE website. Applications for Steps One and Two are available on the National Board of Medical Examiners website (http://www.nbme.org).

Timely Submission of Grades

Course and clerkship directors must submit grades to the Registrar's Office within six weeks of the end of the course/clerkship. If a student's completion of the course requirements has been delayed beyond the end of the six-week period, the course or clerkship director will enter a grade of Incomplete "I" in the system. 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 cannot 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.

Prohibiting the Involvement of Providers of Student Health Services in Student Health Assessment

Providers of health and psychiatric/psychological services to a medical student will have no involvement in the academic assessment of or in decision about the promotion of that student.

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:

- Promoting students whose work is satisfactory.
- Warning 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, including recommending an immediate delay in further progression in the curriculum and that the student repeat coursework the following year.
- Placing on probation or suspension students whose work is unsatisfactory or who have demonstrated unprofessional behavior or requesting the resignation of any student who is considered an unpromising candidate for the degree of doctor of medicine.
- Removing a student on Academic Probation that has satisfactorily demonstrated scholastic requirements or professional behavior either through repeating coursework or demonstration of corrected professional behavior.
- Recommending 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.

Provision of Formative Assessment of Students' Performance

For required courses or clerkships four weeks or longer, formal formative feedback must be provided at least once midway through the course or clerkship. A course or clerkship less than four weeks in length must provide an alternate means by which a medical student can measure his or her progress in learning.

Prohibiting the Involvement of Providers of Student Health Services in Student Assessment and Promotion

Providers of health and psychiatric/psychological services to a medical student will have no involvement in the academic assessment of or in decisions about the promotion of that student.

Preparation for Residents and Other Non-Faculty for Their Role as Educator

The School of Medicine Curriculum Committee requires residents and others (e.g., graduate students, postdoctoral associates, etc.) who teach medical students to be oriented to and prepared for their role in teaching and assessing medical students.

Provision of Narrative Assessment of Students' Cognitive and Non-Cognitive Performance

Narrative description of a medical student's performance, including his or her non-cognitive achievement, must be included as a component of the assessment in each required course and clerkship of the medical education program in which the following apply:

1. The course duration is four weeks or longer.
2. There is sufficient longitudinal and interpersonal interaction of instructors and students such that there is reasonable basis to evaluate the students and provide narrative feedback.
3. Attendance at the learning activities that form the basis of the narrative assessment is required.

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; and
- 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 online via DukeHub. 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; 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 email. 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 mentor, study program director, and their advisory dean. Upon receipt of the signature approvals on the registration form, the students submit the completed form to the third year coordinator. The student is provided a permission number in order to enroll online in the approved study program. The student then enrolls in all required third year course work for the term. 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 emailed 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 Policy

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 students must meet with the course director to determine if a retest can be done. If the course director determines remediation is needed prior to the retest, the student must meet with his/her Advisory Dean and complete a Request for Remediation form. The opportunity to retake an examination is contingent upon the student completing the agreed upon steps developed 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.

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).

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 by meeting with the course director(s) and his/her Advisory Dean and completing a Request for Remediation form to be submitted to the Advisory Dean. The opportunity for reassessment 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.

Timing and Grading

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

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 email 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 student's Duke email 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
- raising 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 are 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.

Student Assignment

Clinical course directors are responsible for assigning students to instructional sites. A medical student may request an alternate training site when circumstances allow for it.

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 in order to be 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. 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. 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 that count towards graduation credits.

Students are asked to complete an evaluation of their study away experience. The evaluations are submitted to the Office of Student Affairs and are available for perusal upon request in the Office of Student Affairs.

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.

The third year requires satisfactory completion of 36 course credits in basic science within 10 months (11-12 months for master's or scholarship students). Students must register for 16.5 credits in the fall term, 16.5 in the spring and the required thesis will account for three credits in the summer. The Practice Year 3 course is required in the fall and spring at 1.5 credits each semester. For those students who are not able to take Practice Course during their 3rd year, the number of credits assigned to the Study Program enrollment will increase accordingly. In no case should students register for more or less than a total of 36 credits during the fall, spring and summer terms comprising the third year. The policy set by the Third Year Committee and the Curriculum Committee states that students may not take other coursework (electives) during their third year scholarly experience unless the coursework (elective) is relevant to the student's research project and approved by the student's mentor and study program director.

Third Year and Coursework (Electives)

The third year requires satisfactory completion of 36 course credits in basic science within 10-12 months. All students must register for 16.5 credits in the fall term, 16.5 in the spring and the required thesis will account for three credits in the summer. The Practice Year 3 course is required in the fall and spring for a total of 3 credits. For those students who are exempted from taking Practice Course during their third year, the number of credits assigned to the Study Program enrollment will increase accordingly. In no case should students register for more or less than a total of 36 credits during the fall, spring and summer terms comprising the third year.

There are several circumstances in which students may integrate electives into their research experience. For example, with mentor approval, students may take one of several pre-approved electives. In general, these are offered in the evenings, and include Effective Teaching, Evidence Based Medicine, and Fluid & Electrolytes. With mentor approval, students may also request to take an elective that is directly related to their research project.

Although it is preferable that full time clinical electives and subinternships be taken prior to or following the research year to promote continuity of the research experience, it is also recognized that there are situations in which it may be advantageous to enroll in a subinternship during the third year. In this circumstance, mentor approval is required, and the duration of the third year will be extended to accommodate the clinical elective.

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 pre-clerkship 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 email 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 CastleBranch. Students that will be assigned at the VA Medical Center must have all required participation documents no later than 30 days prior to the approved elective start date.

- 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 email provided to approved and scheduled students along with Duke specific information on how to establish your profile with CastleBranch. All costs for these required services via CastleBranch are the responsibility of the approved visiting student. These requirements for participation may only be fulfilled/completed via CastleBranch.

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 DukeHub.

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, email the visiting student coordinator at medreg@dm.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 Credit

Doctor of Medicine, Pathologist Assistant, Masters in Management of Clinical Informatics, Masters in Biomedical Sciences, and Clinical Research Program

Time	Requirement	Credit
40 hours	Prep, lecture, and clinical time	1 credit
80 hours	Prep, lecture, and clinical time	2 credits
120 hours	Prep, lecture, and clinical time	3 credits
160 hours	Prep, lecture, and clinical time	4 credits
200 hours	Prep, lecture, and clinical time	5 credits

Doctor of Physical Therapy

The Doctor of Physical Therapy program is currently undergoing a curriculum revision and with the inception of our new curriculum in the fall of 2019 they intend to begin a CARNEGIE system where 15 hours of student contact = 1 credit. That assumes approximately 5 hours of out of class prep time.

Master of Biostatistics and Clincial Leadership Program

Time	Requirement	Credit
3 hours	Prep, assignments, and studying	1 credit

Ophthalmic Technician Certificate Program

Time	Requirement	Credit
32 hours	Prep, lecture, and clinical time	1 credit

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. 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 socioeconomic 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 participating 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 its 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; and
  - 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 with the exception of directory information and disclosure to school officials with legitimate educational interests.

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, Duke Unique ID, telephone listing, email address, 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. 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 online through their DukeHub accounts. Students are sent email notifications to advise of the dates and times for the online 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 online 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 website at 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 to pay all required tuition and fees on a semester/term basis.

For questions regarding this policy, please contact the Office of the Bursar at bursar@duke.edu or the Duke University School of Medicine Office of Admissions at medadm@mc.duke.edu.

Replacement Diplomas

Duke University provides only one diploma to its graduates, whether original or replacement. If you have lost your diploma and wish to have a replacement diploma made, you must fill out a Request for Replacement Diploma Form, certifying how your diploma was lost, misplaced or damaged. The form must be notarized and must include the notary seal. The original signed form, not a copy, must be returned along with a $35 replacement fee, made payable to Duke University. In cases where the original diploma has been marred beyond legibility, the original diploma must be returned along with the Request for Replacement Diploma Form. Please allow eight weeks for processing. In accordance with University policy, a statement of replacement will be printed above the seal on the diploma. It does not mar the appearance nor detract from the value of the actual diploma. The format of the replacement diploma will be the format that was used in the year you received your degree. To obtain a Request for Replacement Diploma Form, 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 or by email at registrar@duke.edu, providing an explanation for your need of a replacement diploma.

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 (OESO) website at http://www.safety.duke.edu/OnlineTraining/. The required modules are listed on the OESO website at http://www.safety.duke.edu. Students will be required to complete some modules through the Learning Management System (LMS). Some modules are only required once every two or three years, which 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 (919) 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/. 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 (919) 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 Ombudsperson. The Student Ombudsperson 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, email 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 Doctor of Medicine, Doctor of Physical Therapy, Physician Assistant, Pathologist's Assistant, and other programs. The fee will not only cover hardware such as laptops or handheld devices, but service, software and technical updates to comply with all Duke Health System compliance guidelines.

Transcripts of Academic Record

Current students may request copies of their academic transcripts online via their DukeHub accounts. Alumni students may obtain a copy of their academic transcripts 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. For questions, please contact medreg@dm.duke.edu or (919) 684-2304.

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

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 no later than June 15, 2018 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 and Davison Council

The Davison Society is composed of the entire student body. Each student pays an annual 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, chief of staff, 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, Alumni Association, and others.

In keeping with the tradition of graduating well-rounded, happy, healthy physicians, the medical school offers a variety of opportunities for service and social activities. For service, the highlight of our year is the biannual Duke in Durham Day, in which the medical school goes out to various sites all over Durham for a day of service in the autumn and in the spring. Previous sites include Eno River, The Ronald McDonald House, Durham Rescue Mission, RESPECTACLE, TROSA, and many more. For social, the salient event of the year is the Davison Ball, a medical school prom.

The Davison Council meets monthly to discuss issues that relate to the medical school. The executive board meets biweekly and works to advocate on behalf of the student body. The Davison Council annually hosts the Dean of the School of Medicine and the Chancellor of Duke Health at its meetings.

Medical student groups affiliated with, and in the past funded by, the Davison Society include Major Groove (acapella), 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 Student National Medical Association (SNMA), the Christian Medical and Dental Society (CMDA), Duke Pride (the Gay-Straight Alliance), 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), the Aesculapian (yearbook), Family Medicine Interest Group (FMIG), the Mind-Body Interest Group, Careers in Internal Medicine Interest Group (CIMIGro), Dermatology Interst Group (DIG), Geriatrics Interest Group (GIG), OB-GYN Interest Group, Emergency Medicine Interest Group (EMIG), Global Health Interest Group (GHIG), Pediatrics Interest Group (PIG), Palliative Care Interest Group, ENT Interest Group (OOHNS), Plastic and Reconstructive Surgery Interest Group (PRSIG), Orthopedics Interest Group (Ortho), and Plastic Surgery Interest Group, among many others.

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 (DMAA) supports and promotes the interests of Duke Health and its extended community and nurtures life-long relationships and learning. Today, the DMAA includes more than 14,500 Duke University School of Medicine graduates and former trainees who live and work across the nation and around the globe. The association also supports approximately 400 current medical students and 900 house staff officers in various ways. Each year the DMAA sponsors events and programs for medical students including Medical Families Day; the Appleseed Award; and the *Aesculapian* (yearbook). The association also provides stethoscopes and embroidered white coats for first-year students; Match Day and graduation gifts for fourth-year students; and distributes *DukeMed Alumni News* to current trainees.

President: Katherine S. Upchurch, MD '76
President Elect: Oren Cohen, MD '87
Sarah Nicholson, Assistant Vice President, School of Medicine Development and Alumni Affairs

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 2016, the Duke University School of Medicine was fully accredited 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 (Clinical Skills Foundation I): 1.5 course credits
- INTERDIS 100B (Molecules, Cells and Tissues): 6 course credits
- INTERDIS 101B (Human Structure and Function): 12 course credits
- INTERDIS 106B (Cultural Determinants of Health & Health Disparities): 0.5 course credits
- INTERDIS 107B (Introduction to the Medical School Profession): zero course credits

Semester 2

- INTERDIS 105B (Clinical Skills Foundation I): 1.5 course credits
- INTERDIS 103B (Brain and Behavior): 4 course credits
- INTERDIS 102B (Body and Disease): 20 course credits
- INTERDIS 106B (Cultural Determinants of Health & Health Disparities): 0.5 course credits

Year One Courses

Year one consists of four integrated basis 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 101B (Human Structure and Function) (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 (Clinical Skills Foundation I)—(doctor/patient relationships, interviewing, physical exam, basic counseling skills)—four hours per week for entire year
- INTERDIS 106B (Cultural Determinants of Health & Health Disparities—longitudinal 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 55 course credits in the approved clinical science curriculum.

The second year consists of the clinical skills course, eight core clerkship rotations, 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
Clinical Skills Foundation II- 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
Selectives	Two 2-week selectives, 2 course credits each

Students are required to choose two different selective opportunities in specialty or subspecialty areas in the required clinical year for career exploration (except those students in the longitudinal integrated clerkship as part of the Primary Care Leadership Track). These two-week, pass/fail courses provide an immersion experience in a particular field without the stresses of exams. All selectives are approved by the Curriculum Committee and meet school standards for student supervision and quality of clinical experience.

Note: Students on the Primary Care Leadership Track (PCLT) must complete the core clerkships, Clinical Skills Foundation II, clinical skills, clinical core, assessment, four-week, 4-course credit emergency medicine (SURGERY 252C) rotation, one two-week second year selective course, and the required tutorial course.

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)

Clinical Skills Continuity

All students are required to complete the continuity clinic requirement. A continuity ambulatory (outpatient) care experience 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 Clinical Skills Continuity 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 the student's 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 (Clinical Skills Continuity) 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 the 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 Course Requirements on the next page 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 Medical Student Research Day (AOA Day). AOA attendance is required. Exemptions must be approved by the vice dean.

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 a time approved by their mentor 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 cannot take for "graduation credit" more than three electives in a given subspecialty field. For example, a student intending to match in orthopedic surgery can do three orthopaedics electives, one at Duke and two study-away for credit towards graduation. If the student plans a third course, they will receive credit for it, but it will not count toward the 24 elective credits needed for graduation. Advisory deans approve their advisees' elective course selections and encourage students to take a broad range of courses even if they plan to subspecialize. Exceptions are made for students enrolled in longitudinal integrated clerkship (LIC) experiences.

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
- Clinical Skills 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 Clinical Skills Continuity course requirement (INTERDIS 305C) 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 Clinical Skills Continuity course (INTERDIS 305C) 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 Clinical Skills Continuity requirement are:

- ANESTH 446C (Acute and Chronic Pain Management)
- COMMFAM 423C (Occupational and Environmental 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 423C (Rheumatology)
- MEDICINE 431C (Adult Allergy and Clinical Immunology)
- MEDICINE 434C (Outpatient Hematology-Oncology (Duke or Durham VA))
- MEDICINE 449C (Geriatric Medicine)
- PEDS 403C (Med-Peds Ambulatory Rotation)—applies to 4 credit option only
- 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 402C	PEDS 411C
ANESTH 440C	PEDS 426C
ANESTH 441C	PEDS 440C
MEDICINE 404C	SURGERY 412C
MEDICINE 405C	SURGERY 441C
MEDICINE 406C	SURGERY 443C
NEURO 401C	

Courses that count toward Subintership requirement	
ANESTH 401C	OBGYN 447C
ANESTH 441C	ORTHO 429C
COMMFAM 401C	PEDS 401C
MEDICINE 401C	PEDS 426C
MEDICINE 402C	PSYCHTRY 401C
MEDICINE 404C	PSYCHTRY 407C
MEDICINE 405C	SURGERY 401C
MEDICINE 406C	SURGERY 402C
MEDICINE 407C	SURGERY 403C
NEURO 401C	SURGERY 441C
NEUROSUR 401C	SURGERY 448C
OBGYN 405C	SURGERY 451C
OBGYN 407C	

Duke Neurosurgery Academic Coaching and Education Program (Neurosurgery ACE)

The Duke Neurosurgery ACE (Neurosurgery Academic Coaching and Education) Program is designed to provide mentoring, coaching, and preparation for entry into neurosurgery residency programs. Available to incoming MS1s and rising MS2s, the program will provide individual faculty and resident mentors, early practice interviews, and sub-internships. In the MS3 year, the participants will be allowed to interview and receive feedback on their entire application. This specialized curriculum will prepare involved students to become strong neurosurgery resident candidates at Duke or elsewhere and allow for a specialized curriculum for the last half of the MS4 year. Contact Vice Chair of Education in Neurosurgery, Dr. Michael Haglund (michael.haglund@duke.edu) for further information.

Longitudinal Integrated Clerkship Year (LIC)

Director: Myles Nickolich, MD; Co-Directors: Barbara Sheline, MD, Katy Peters, MD and Eugene Kovalik, MD. Approved March 2017

The Longitudinal Integrated Clerkship (LIC) track is a second year curriculum focused on providing a patient-centered, learner-centered comprehensive clinical-year curriculum with an emphasis on understanding longitudinal patient care in varied clinical settings in the context of health systems. Students will have an opportunity to explore all major subject areas of medicine and will be assigned LIC mentors to assist in directing their educational journey and exploring areas of clinical interest while developing a strong and broad foundation in clinical care of patients.

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

Overview of the Four Years

Year One: Students will complete the first-year Duke science curriculum and the Clinical Skills Foundation course with traditional students. Interested students will apply for LIC admission during the first year.

Year Two: LIC students have a 12-month experience with an 8-month longitudinal component and focused inpatient experiences. Longitudinal components will include experiences in adult medicine, family medicine and primary care, pediatrics, and surgery and each student will be paired with a primary preceptor for each of these areas. Students will also complete a longitudinal mental health seminar. Emergency medicine and acute care medicine will be offered in urgent care, and standard and high acuity emergency medicine settings.

Students will have 4 months of inpatient immersion experiences throughout the areas of psychiatry, neurology, surgery, internal medicine, pediatrics, and obstetrics and gynecology. Students will complete a longitudinal seminar. Students will have additional exposure to coursework in community engagement, cultural competence, health literacy, quality-improvement, and health policy and global health. Students will also complete two second year two-week selectives. Finally, students will complete the clinical skills courses as required for traditional Duke SOM students.

Year Three: Traditional research year followed by all students.

Year Four: LIC students will choose from a variety of electives available to all students. There is a required two-week radiology selective based on student interest.

Primary Care Leadership Track

Director: Barbara Sheline, MD, MPH; Co-Directors: Elizabeth Erickson, 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.

Students committed to primary care have the opportunity to receive a scholarship up to $40,000. The scholarship is designed to help reduce the need-based loan debt for students that had to take out need-based loan to support their medical expenses while in medical school. In the final year of medical school, a student can receive up to $40,000. If in the fourth year the student only received $25,000 in loans, the scholarship would be $25,000. Students that have not taken out need-based loans will not qualify for this scholarship.

The scholarship is for those PCLT students who match in a primary care field. Primary Care is defined by PCLT to be:

a. Family Medicine
b. Pediatrics with the intent to practice primary care pediatrics
c. Internal Medicine with the intent to practice general adult medicine or geriatrics
d. Obstetrics and Gynecology with the intent to practice general OB/GYN
e. Pediatric/Psychiatry joint residency with the intent to practice general pediatrics and psychiatry
f. Medicine/Pediatric joint residency with the intent to practice general adult medicine and psychiatry
g. Primary care geriatrics

In addition, PCLT students will be required to submit verification of employment annually for 5 years after graduation. Students that do not remain in the primary care field will have full amount of scholarship awarded revert to a loan and be required to repay the funds as a loan.

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 Clinical Skills Foundation course with traditional students.

Year Two: PCLT students have an eight-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. Clinical Skills Foundation II course continues through Year Two. PCLT students complete a Quality Improvement Project. Students will complete one two-week selective in the fall term.

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 are encouraged to 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 2018-2019 is $31,109 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 46.5 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. These courses include:

- INTERDIS 100B - Molecules and Cells (integration of biochemistry, genetics, and cell biology)—six and a half weeks
- INTERDIS 101B - Human Structure and Function (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
- INTERDIS 106B - Cultural Determinants of Health and Health Disparities—one session per month (12 sessions); 3.5 hours per session
- INTERDIS 107B - Introduction to the Medical School Profession—one week

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 periods, 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 - 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 Computational Biology and Bioinformatics Program 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 advisor 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 emailing 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 MST 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 and the fourth 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 Christine Marx, MD.

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

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. Options for creating a one-year program to be situated in the third year of medical school will be explored in the future.

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; meh@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.ctsi.duke.edu/what-we-do/nih-clinical-and-translational-science-award-ctsa.

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/MA in Engineering

Name of Degree: Master of Engineering

This 5-year program is designed for MD candidates who wish to also obtain a Master of Engineering (MEng) degree. In brief, students spend four years (Years 1, 2, 4 and 5) in medical school to fulfill the MD curriculum requirements, and one year (Year 3) to take the required MEng courses detailed below. In the fourth year, students 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 and write a thesis, for which they will receive School of Medicine credit in fulfillment of their Third Year thesis requirement.

Tuition Arrangements: 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]). The typical MEng degree is 3 semesters and so this concurrent degree is 2/3 the cost of a stand-alone MEng degree.

Location: Pratt School of Engineering

School of Medicine Requirements: The MD curriculum requirements for typical Years 1, 2, and 4 (Year 5 for these students) will remain unchanged by this program.

School of Medicine Third Year thesis credit will be based on submission of a document whose rigor is consistent with current Third Year theses. As with all current Third Year theses, the thesis proposals will require Third Year School of Medicine approval. The thesis would consist of a detailed Business Plan, complete with extended Introduction (similar to the extended Introduction currently required of Third Year students who choose the manuscript or grant alternative theses) stating more thoroughly the healthcare, public health, or health hazard need being addressed. The scope, subject, and outcomes of the thesis will be determined by the Engineering program of specialization in collaboration with the School of Medicine. Examples could include: Development of a new technology and working prototype to improve healthcare; Evaluation of technologies for improving public health; Optimization of engineered systems to minimize exposure to environmental health hazards, etc. A thesis alternative can be submitted in the form of a SBIR/STTR grant application since the grant thesis alternative is already an approved option offered to all Third Year medical students. At the discretion of and selected by the Third Year Committee, the thesis may be reviewed by faculty or other experts well versed in the specific technology field who are not on the Committee. These external reviews would be used by members of the Third Year Committee to grade the theses in order to ensure that the grading standards, rigor and criteria are consistent with current theses. The thesis may also be used to fulfill requirements for the MEng 550/551 courses.

Pratt School Requirements:

Master of Engineering students in all majors must complete 30 credits comprised of key program elements as follows:

- Core industry preparatory courses (6 credits)
- Departmental or interdisciplinary core courses (15-18 credits, varies by major)
- Technical electives in a concentrated area (6-9 credits, varies by major)
- Internship, Project, or Equivalent

Additionally, some majors have a seminar participation requirement.

The MD/MEng student will fulfill all of the requirements of the MEng degree. To accomplish this, the following accommodation has been made for those seeking a dual degree:

- 6-9 credits (depends on MEng major) required for the MEng degree may be fulfilled based on satisfactory completion of the MS 1 Basic Sciences curriculum (see table on next page).

Major	MD Credits Applied to MEng Degree	Description
Biomedical Engineering	9	3 credits - Life Science Requirement 6 credits - Technical Electives
Civil Engineering	6	6 credits - Technical Electives
Electrical and Computer Engineering	9	9 credits - Technical Electives
Environmental Engineering	9	9 credits - Technical Electives
Materials Science and Engineering	6	6 credits - Technical Electives
Mechanical Engineering	6	6 credits - Technical Electives
Photonics and Optical Systems	6	6 credits - Technical Electives

- Internship, project, or equivalent requirement may be fulfilled as described below.

In the 4th year, each MEng student is required to undertake a practical internship, which must encompass at least 320 person hours of effort (as documented in their detailed laboratory notebook). These internships are by nature focused on engineering applications and technology development. To achieve this, each MD/MEng student may work under the auspices of Faculty in the School of Medicine, MedBlue Program, the Pratt School of Engineering, or other similar program to be reviewed and approved by representatives from the MEng and SOM faculty. Specifically, each MD/MEng candidate will:

a. work under the guidance of one or two attending physicians and engineers during their 4th year ("second third year") to identify and complete at least one comprehensive Confidential Need Specification with the sponsorship of one of the clinical faculty;
b. develop new technologies or engineering approaches (including optimization/system analysis or feasibility analysis, etc.) for improving healthcare, improving public health, or reducing health hazards based on Need Specification;
c. present their proposed technology or engineering approach to a select group of prospective investors and/or end users (clinicians);
d. complete an Invention Disclosure Form approved by faculty advisor for the project and the faculty who teach the internship course, MEng 551;
e. (optional) submit the IDF, which requires review and signature of appropriate SOM Department Chair; review and signature by appropriate Engineering Department Chair; and
f. (optional) provide required information and support to OLV to assist in their review and action.

Example Curriculum: Master of Engineering in Biomedical Engineering with emphasis on Healthcare Innovation and Entrepreneurship

The MD/MEng dual degree is most closely aligned with the Biomedical Engineering major. Additionally, it is believed that the appeal in this program will be for medical students with an interest in innovation and entrepreneurship. Therefore, as an example, the Pratt course work requirements for a major in Biomedical Engineering with an emphasis in Healthcare Innovation and Entrepreneurship are outlined on the next page.

Requirement	MD/MEng Fulfillment of Requirement
Core Industry Preparation Courses (6 credits)	MEng 540 Management of High Tech Industries (3 credits) MEng 570 Business Fundamentals for Engineers (3 credits)
Life Science (3 credit)	Satisfactory completion of MS 1 Basis Sciences
Advanced mathematics (3 credit)	See MEng website for approved math courses
BME courses (9 credits)	BME 590.01 Biomedical Device Innovation (3 credits) Select from BME offerings and constrained by BME curricular notes listed on MEng BME website (6 credits)
Engineering Elective (3 credits)	BME 490 Special Topics in BME Design (3 credits)
Other technical electives (6 credits)	Completion of MS1 Basic Sciences fulfills this requirement)
Internship, Project or Equivalent (zero credits)	MENG 550 Internship or Applied Research* Project MENG 551 Internship/Project Assessment*
BME seminar (zero credits)	EGRMGMT 501 Engineering Management Seminar

*Students perform internship as described in this proposal.

Application Requirements and Process: All applications should be submitted using the online application to the Pratt School of Engineering, The current application requirement are

- a bachelor's degree in engineering or science from an accredited institution (transcripts required, including an estimated GPA)
- Statement of Purpose
- Résumé
- Three letters of recommendation
- Graduate Record Exam (GRE) results
- Test of English as a Foreign Language (TOEFL) results (international applicants only)
- A nonrefundable application fee of $75 US, to be paid via check made out to Duke University or via credit card if using our online application

MD/MEng students should also indicate on their application that they will be pursuing MEng as a concurrent degree. Although the application deadline is June 15, students interested in this program should apply before April 1 of the MS2 year.

Additional Requirements: The MS2 applicant must be in good standing with the School of Medicine.

Graduation: Since this is a concurrent degree and Medical School courses are being used to fulfill MEng degree requirements, the MEng degree will be granted simultaneous to the granting of the MD degree, typically at the end of the 5th year. If a MD/MEng student leaves the MD program before completing both degrees, a case-by-case analysis may be performed to determine if the MEng degree may be granted independently or if additional coursework is required to independently fulfill the MEng degree requirements. Since no accommodation has been made to the MD requirements, students withdrawing from the MEng degree will not impact MD degree requirements.

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)—must be approved by third year committee prior to start of program

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 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 Laura Bey, Assistant Director of Undergraduate and Medical School Programs, laura.bey@duke.edu; or visit https://globalhealth.duke.edu/education-and-training/graduate/master-of-science.

Master of Management in Clinical Informatics: MD/MMCi (Duke or UNC)

The School of Medicine 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 Kevin Schulman, MD, MBA, Third Year Program Director for MMCi, kevin.schulman@duke.edu, or visit https://mmci.duke.edu/. Alternative contact is Randy Sears, MBA.

Master of Professional Science in Biomedical and Health Informatics (UNC) - CHIP (Carolina Health Informatics Program)

The dual degree program in informatics at The University of North Carolina at Chapel Hill is available to third-year medical students. With a focus on implementation science, the MPS is designed to be terminal degree—i.e. a PhD is not required as in other Medical I Informatics programs. The Carolina Health Informatics Program (CHIP) coordinates with Library School, Computer Sciences, Nursing, Public Health, School of Medicine, and Kenan Business School.

Name of Degree: Master of Professional Science in Biomedical and Health Informatics

Options/Tracks within the Degree Program: Clinical and Public Health. CHIP can customize the degree program if several MDs/ students are going through it at same time. Clinical track grew out of a certificate program developed in conjunction with Duke (Ed Hammond) for creating a subspecialty for physicians interested in informatics and the new informatics board.

Application Process: Follow normal process applying through Graduate School and CHIP. Physicians/medical students can use their MCAT scores instead of GREs.

Length of Program: 12 to 18 months with a practicum—12 months can be done by Duke students with a full load. Starts at end of August.

Required Research: Project paper that could become a thesis. Presentations and posters (online) are required.

Focus:

- Data – from acquisition to analysis – health data, statistics, validity, quality, etc.
- Systems – deploy and create systems, systems design, usability, systems analysis
- Human/societal – how health care works and the systems within it

The program is more residential as opposed to commuter; it is very hands-on, with students working closely with faculty throughout the program.

Assigned mentors, as well as faculty advisors, work with students on the practicum. Students begin identifying a mentor and project in their first semester. Mentors can be from UNC, industry, or other relevant settings, including Duke—others have been from SASS, RTI, Quintiles, and BCBS.

Compared to Duke's MMCi degree, which is 50% business school courses and 50% informatics, the UNC MSP degree is more focused on informatics with business related electives and has more focus on healthcare as a system than business skills.

For more information, contact Larisa Rodgers, CHIP Coordinator, or Director Javed Mostafa, PhD, Professor School of Information and Library Science, joint appointment Biomedical Research Imaging Center. He is also adjunct faculty in Duke CFM.

Master of Science of Information Science: MS/MSIS

The information science degree program is offered by The University of North Carolina at 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-Chapel Hill 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-Chapel Hill 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 the Third Year Program Director for MSIS 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-Chapel Hill 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-Chapel Hill 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 the Third Year Program Director for MLS 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)

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 an approved business school at another university. Must be approved by the Third Year Committee prior to beginning any away program. Leave of absence required for first year of program for first year at any location except Duke Fuqua School of Business.

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: Students are responsible for full tuition at the School of Medicine and at Fuqua. Students who are simultaneously enrolled and being charged tuition through Fuqua and the School of Medicine 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 the School of Medicine and Fuqua. The Medical School financial aid office handles the financial aid for that year.

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

For more information, contact Jennifer Perkins, MD, jen.perkins@duke.edu, Study Program Director or (919) 684-3841.

MD/JD

Name of Degree: Juris Doctor (three years)

Options/Tracks within the Degree Program: Varies

Course of Study: Six semesters of coursework

Location: Duke University School of Law. Must be approved by third year committee

Length of Program: usually three years, with requirements of third year medical school accomplished in third year 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.

MD/MPH

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 a student's 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.

Students interested in another study track at the School of Public Health 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.

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.

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

Course of Study: Three to four semesters of coursework; master's thesis is required in both schools.

Location: Duke Sanford School of Public Policy (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.

Tuition Arrangements (at a MBA study away institution): 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 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 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

(Course offerings subject to change.)

Anesthesiology

Interim Chair: Joseph P. Mathew, MD, MHSc, MBA
Assistants: Meghan Blafrey and Melinda Macalino
Business Manager: John Borrelli
Campus PO Box: 3094
Phone: (919) 681-6646
Fax: (919) 681-2923

Clinical Science Electives

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). Didatic 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 Mia Berg at mia.berg@duke.edu or (919) 681-6437. Credit: 2; Max: 4, Min: 1. *Stuart Grant, M.B., CH.B*

ANESTH-221C. Pain Management. Students will participate in both outpatient and inpatient 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 Jace Carter, MD*

ANESTH-401C. Cardiothoracic Intensive Care Sub-Internship. The cardiothoracic intensive care sub-internship will allow fourth year medical students to be exposed to and participate in the care of the post-operative and critically ill cardiac and thoracic surgery patient. This patient population has the highest rate of invasive monitoring, echocardiographic and hemodynamic assessment, and advanced circulatory support including utilization of inotropes, vasopressors, and mechanical circulatory support devices (LVAD, RVAD, IABP). A working knowledge of these concepts will be critical to a future career in Anesthesiology, Critical Care Medicine, or Surgery. This sub-internship level course will allow students to participate in patient care 6 days a week. This will be an in-depth experience in cardiac critical care medicine. Students will be evaluated on their knowledge, skills, and ability to facilitate patient care in this environment. Students will be expected to take a high degree of ownership of their patients, communication between the critical care, surgery, and anesthesia teams will be emphasized. This sub-internship course will not fulfill acute care curriculum requirement. For more information contact Dr. Quintin Quinones at quintin.quinones@dm.duke.edu or Jaime Cooke at jaime.cooke@duke.edu or (919) 681-6532. Credit: 5. Enrollment: Max-2 Min-1. *Quintin Quinones MD, PhD; Raquel Bartz, MD; Madhav Swaminathan, MBBS; Mihai Podgoreanu, MD; Mauricio DelRio, MD; Ian Welsby, MBBS, BSc; Kamrouz Ghadimi, MD; Jerrold Levy, MD; Mandisa-Maia Jones-Haywood, MD; Ehimemen Iboaya, MD;Annemarie Thompson, MD; Mani Daneshmand, MD; Jack Haney, MD; Nazish Hashimi, MD; Sharon McCartney, MD; andJacob Schroeder, MD*

ANESTH-402C. Cardiothoracic Intensive Care Elective. The cardiothoracic intensive care elective will allow fourth year medical students to be exposed to and participate in the care of the post-operative and critically ill cardiac and thoracic surgery patient. This patient population has the highest rate of invasive monitoring, echocardiographic and hemodynamic assessment, and advanced circulatory support including utilization of inotropes, vasopressors, and mechanical circulatory support devices (LVAD, RVAD, IABP). A working knowledge of these concepts will be critical to a future career in Anesthesiology, Critical Care Medicine, or Surgery. This elective level course will allow students to participate in patient care 5 days a week. This will be an in-depth experience in cardiac critical care medicine. Students will be evaluated on their knowledge, skills, and ability to facilitate patient care in this environment. This elective will fulfill acute care curriculum requirement. For more information contact Dr. Quintin Quinones at quintin.quinones@dm.duke.edu or Jaime Cooke (jaime.cooke@duke.edu, (919) 681-6532. Credit: 4. Enrollment: Max-4 Min-1. *Quintin Quinones MD, PhD; Raquel Bartz, MD; Madhav Swaminathan, MBBS; Mihai Podgoreanu, MD; Mauricio DelRio, MD; Ian Welsby, MBBS, BSc; Kamrouz Ghadimi, MD; Nazish Hashimi, MD; Jerrold Levy, MD; Mandisa-Maia Jones-Haywood, MD; Ehimemen Iboaya, MD; Sharon McCartney, MD; Annemarie Thompson, MD; Mani Daneshmand, MD; Jack Haney, MD; and Jacob Schroeder, MD*

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 Freiberger, 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: NOTE: This course may require rotations at the VA Medical Center. Students must complete the required VA Medical Center paperwork no less than 60 days prior to the first day of classes in order to participate. For more information and permission numbers, please contact Mia Berg at mia.berg@duke.edu or (919) 681-6437. Permission is required. Enrollment Max: 4. Credit: 4. *Joshua Dooley, 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. C-L: SURGERY 441C. Credit: 5. Enrollment: max 2. *Christopher Young, MD; Kelli Brooks, MD; Nancy Knudsen, MD; John Lemm, MD; Eugene Moretti, MD/MHSc; Ehimemen Iboaya, MD; Arturo Suarez, MD; Xueyuan (Shelly) Wang, MD; Lisa Pickett, MD; Mark Shapiro, MD; Vanessa Schroder, MD; Courtney Sommer, MD; Cory Vatsaas, MD; and Steven Vaslef, MD, PhD. VA Attendings: Atilio Barbeito, MD; Raquel Bartz, MD; Charles Brudney, M.B., CH.B.; and Karthik Raghunathan, MD*

ANESTH-445C. Physiology & Medicine of Extreme Environments. Advanced topics in the physiology and medicine of: altered ambient pressure, immersion, gravity, temperature, breathing gas composition and hibernation. 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). Reading: The Biology of Human Survival Life and Death in Extreme Environments, Claude A Piantadosi (author) Prerequisites: Human anatomy and physiology. Attendance, either online via webex or in person is MANDATORY unless otherwise approved by the course director, in order to receive credit. Examinations are open notes / open book short essay. The course will meet weekly on Thursday evenings from 5:00pm until 7:30pm beginning in January, in the Hyperbaric Center Library (room 0584). Basement, White Zone, Bldg. CR II. For more information contact Dr. Jake Freiberger: email john.freiberger@duke.edu or by phone at 684-6726. Email permission of instructor is required. John Freiberger, MD/MPH and Richard Moon, MD. After online enrollment has been completed for other spring courses, students must forward the email approval to medreg@dm.duke.edu for manual enrollment in ANESTH 445C. Credit: 1. Enrollment: max 15, min. 6. *John Freiberger, MD/MPH*

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 involvement emphasizes a multidisciplinary approach appropriate for the individual patient. Topics reviewed include pharmacotherapy including opioid management, interventional procedures such as epidural and peripheral nerve catheter placement, nerve blocks, neurolytic procedures, as well as implantable devices. The benefits of physical and psychological therapy are 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.waters@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 Jace Carter, MD*

Community and Family Medicine

Chair: Anthony Viera, MD, MPH
Assistant: Kaye Gardner
Business Manager: Ellen O'Briant
Campus PO Box: 2914
Phone: (919) 681-3178
Fax: (919) 681-5785

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 sites across the Triangle and across the state. A placement preference form will be sent to students prior to start of second year. If you do not have access to a reliable vehicle, please notify the clerkship director Nancy Weigle at least 12 weeks prior to the start of the clerkship. 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*

COMMFAM-209C. Longitudinal Integrated Curriculum (LIC) - 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. Credit. 4. *Nancy Weigle, MD*

Second Year, Two-Week Clinical Selectives

COMMFAM-220C. Occupational Medicine: Prevention and 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 Cassie Ebert at (919) 681-3066 or via email at cassie.ebert@duke.edu. *Carol Epling, MD/MSPH; Dennis Darcey, MD, MPH*

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: Franca Alphin, MPH at franca.alphin@duke.edu for permission. *Franca Alphin, MPH—Not currently offered.*

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*

Clinical Science Electives

COMMFAM-401C. Sub-Internship 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. Permission is required. Credit: 5. Enrollment: max 1 per session. *Joyce Copeland, MD, and Nancy Weigle, MD*

COMMFAM-403C. Community Clinic Leadership Elective - Holton Clinic. Over the course of the both semesters students will provide leadership to the DSOM Holton Clinic, operating at Holton Wellness Center from 5:30-9:30pm on Fridays. Under the supervision of a clinician, students will lead the clinical team through overseeing the care of patients, developing care management plans, and supervising MS1s. Students will be responsible for weekly operations of the clinic, such as scheduling students, follow-up with patients, and coordinating with clinic staff. Additionally, students will define goals for learner development and patient care, and engage in quality improvement that impact learners (i.e. developing teaching modules). Offered to approved 3rd and 4th year medical students. Third year students must obtain approval to enroll from their third year mentor. Third year students will receive one clinical credit toward their fourth year upon successful completion. NOTE: Students may only sign up for the Holton Clinic or the Fremont Clinic. Students may not enroll in both courses. This is a longitudinal course. A grade of "Z" will be entered in the fall term and credit will be awarded in the spring term. Credit. 1; Enrollment Max. 6. Prerequisite: Permission of instructor is required. Course is graded "Credit or No Credit." *Alison Clay, MD and Michelle Lyn, MBA, MHA*

COMMFAM-404C. Community Clinic Leadership Elective - Fremont Clinic. Over the course of the both semesters students will provide leadership to the Fremont Clinic, operating at Fremont Clinic from 7:30am-1:30pm on Saturdays. Under the supervision of a clinician, students will lead the clinical team through overseeing the care of patients, developing care management plans, and supervising MS1s. Students will be responsible for weekly operations of the clinic, such as scheduling students, follow-up with patients, and coordinating with clinic staff. Additionally, students will define goals for learner development and patient care, and engage in quality improvement that impact learners (i.e. developing teaching modules). Offered to approved 3rd and 4th year medical students. Third year students must obtain approval to enroll from their third year mentor. Third year students will receive one clinical credit toward their fourth year upon successful completion. NOTE: Students may only sign up for the Holton Clinic or the Fremont Clinic. Students may not enroll in both courses. This course is considered longitudinal. A "Z" grade and zero credit will be entered for the fall term. Credit (CR) will be awarded with one credit upon successful completion during the spring term. Credit. 1; Enrollment Max. 6. Prerequisite: Permission of Instructor is Required. Course is graded "Credit or No Credit." *Barbara Sheline, 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. Permission is required. 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 work site health programs. Credit: 4. Two months advance notice and permission from instructor is required. Permission 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-433C. Community Health. This elective introduces students to the concepts and practice of community-engaged 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, Course Director*

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: Successful 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. Permission is required. Credit: 4. Enrollment: min 1, max 4. *Joyce Copeland, MD and Nancy Weigle, MD*

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, CDS); Role of health IT in patient safety; Health information standardization (e.g. HL7); and Medical Information Terminologies/Taxonomies (e.g. SNOMED). 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. Offered during spring section 42 only. Permission is required. Credit: 4. Enrollment: max: 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

Chair: Russell P. Hall, III, MD
Assistant: Tria Smothers
Business Manager: Virginia King-Barker
Phone: (919) 684-3110
Fax: (919) 684-3002

Second Year, Two-Week Clinical Selectives

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 online modules as well as textbook readings. Students will be given the opportunity to identify a mentor and/or opportunities for research. Credits: 2. Enrollment Max: 1, unless otherwise noted. *Caroline Rao, MD*

Clinical Science Electives

DERMATOL-401C. Dermatology Inpatient Consults. Dermatology Inpatient Consults offers an option for fourth year students who are interested in a brief introduction to dermatology. Students will participate in the evaluation and management of hospitalized patients and

will have the opportunity to work directly with the dermatology chief resident and consult attending. Credit: 2. Enrollment: max 1. *Caroline Rao, MD; Adela Cardones, MD; Navjeet Sidhu-Malik, MD; Sarah Wolfe, MD*

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. NOTE: Students must contact the course director at least 4 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. Dr. Caroline Rao is the course director and may be reached at 681-3590 or 970-9601. Secondary Contact: Rita Chambers, rita.chambers@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

Clinical Science Elective

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 125. *Thomas McIntosh, PhD; Richard Brennan, PhD; Jennifer Carbrey, PhD; Jonathan Cohn, M.D., and staff*

INTERDIS-101B. Human Structure and Function. This core course of the preclinical curriculum is intended to present the scientific principles underlying the structure and function of the human structure and function thereby providing the foundational knowledge for the practice of medicine and facilitating the incorporation of the new scientific knowledge thorough out the medical career. To accomplish this end, the goals of the Human Structure and Function 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. *Jennifer Carbrey, PhD; 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 team-based exercises, a variety of small group activities guided by faculty, clinically-oriented disease workshops, team-based case discussions, and updated lectures. Credit: 20. Meeting Location for First Day of Classes: Room 2050 (Learning Hall) Trent Semans Center for Health Education. *J. Victor Nadler, J. Andrew Alspaugh, Andrea T. Deyrup, Michael Dee Gunn, and Linton Yee*

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-105B. Clinical Skills Foundation (CSF1). The Clinical Skills Foundation courses (CSF) are required in years one, two, and three. CSF 1 emphasizes clinical skills development using lecture and small group teaching, and outpatient clinical work. Year one CSF introduces students to interviewing and physical diagnosis skills with emphasis on the doctor/patient relationship. CSF 1 uses written assignments, self-directed learning, video recording and group discussion to meet course goals. Student's 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-106B. Cultural Determinants of Health and Health Disparities. This curriculum will assist students in exploring the cultural and social determinants of health. Through experiential elements and educational sessions led by dedicated faculty facilitators, students will gain a deeper understanding of issues related to culture, ethnicity, disability, sexual orientation, sex, and gender while exploring contributors to health disparities among vulnerable populations. Students will also examine concepts of community engagement, social justice, and the cultural history of Duke Health and Durham. Through the evaluation of peer-reviewed literature regarding health disparities, students will gather knowledge and skills to mitigate provider influences on disparities and ultimately improve the quality of healthcare. Graded Credit/No Credit. Credit. 0.5. *Kenyon Railey, MD*

INTERDIS 107B. Introduction to the Medical Profession. This course is required for all entering medical students. It is designed to provide a broad overview of the profession from a variety of perspectives. It will also aim to clarify the goals, expectations, demands and professional requirements placed upon you as you transition from undergraduate school to a physician-in-training. The course will meet for most of each day and will involve both large and small group experiences. No Credit. Graded Credit (CR) or No Credit (NC). *Caroline Haynes, MD/PhD*

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. All 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/No Grade: *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/No Grade: *Dennis Clements, MD/PhD*

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 Step1licensing 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 will assist the medical student in patient care by providing a foundation of clinical skills taught longitudinally through the clinical year to complement 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. Interpretation and characteristics of diagnostic tests, including electrocardiograms and laboratories studies, will be emphasized. 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: *Saumil Chudgar, MD and staff*

INTERDIS-205C. Clinical Skills Foundation 2 (CSF2). Year two in the Clinical Skills Foundation course students develop advanced communication skills and reflect on ward experience in a small group setting. Discussion topics include ethics, spirituality, pain, professional identity formation, and end of life issues. Credit: 2. *Nancy Weigle, MD*

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. Credit: 1. *Barbara Sheline, MD and Bruce Peyser, MD*

INTERDIS-210C. Quantitative Medicine and Decision Making I. The Quantitative Medicine and Decision Making I course is a required course that offers joint training in evidence-based medicine and medical statistics by interweaving related topics from both content areas during the 2nd year of medical school. Enrollment Max: 125; Credit: 0.5 For more information please contact Megan Von Isenburg (megan.vonisenburg@duke.edu). *Jane Gagliardi, MD; Jesse Troy, MD, and Megan Von Isenburg*

INTERDIS-211C. Longitudinal Integrated Clerkships (LIC). 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. *Myles Nickolich, MD*

INTERDIS-212C. Longitudinal Integrated Clerkships 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. Credit: 1. *Myles Nickolich, MD*

INTERDIS-300B. Quantitative Medicine and Decision Making II - Medical Statistics. The Quantitative Medicine and Decision Making II-Medical Statistics is a required component of the Quantitative Medicine and Decision Making II course that offers joint training in evidence based medicine and medical statistics by interleaving related topics from both content areas during the 3rd year of medical school. Active participation will be possible for students who are on and off campus during the 3rd year, and all course materials will be archived and accessible. All students must complete Quantitative Medicine and Decision Making II-Medical Statistics. Students may receive credit for Quantitative Medicine and Decision Making II-Medical Statistics through prior completion or concurrent enrollment in another training program that provides similar education (e.g. MPH degree programs at accredited institutions, masters level training through the Duke Global Health Institute, the Duke Clinical Research Training Program, or a science-related PhD earned prior to attending Duke School of Medicine). Waivers will be granted for Quantitative Medicine and Decision Making II-Medical Statistics only. All students must complete Quantitative Medicine and Decision Making II-Evidence Based Medicine (EBM).Credit: 1. *Jesse Troy, MD*

INTERDIS-305C. Clinical Skills Continuity Clinic. 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, students can take the course while studying away with the following identified: type of contact with patients, the type of patients, and the length of time spent 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. 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 is required by the Course Director prior to beginning clinic and attendance must be documented by the preceptor. 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). A student may choose to do all 34 weeks at the same approved site. Credit: 3.0. *Nancy Weigle*

INTERDIS-312B. Research Ethics. Research Ethics is due 30 days after the student begins their research. This is true even if the student is completing research and studying for the boards simultaneously. *Daniel Laskowicz, MD*

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-470C. MSTP Clinical Research Experience. Clinical research experience for MSTP student's only. No credit. *Staff*

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*

Clinical Science Electives

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. The course should be taken simultaneously with the course that will satisfy the acute care course requirement as the courses build on the clinical environment and vice versa. Primary Contact Dr. Nancy Knudsen, Secondary Contact Anne Bowman. No Credit. Enrollment max: 18; min: 4. *Nancy Knudsen, MD*

INTERDIS-402C. Introduction to Healthcare Markets and Policy for Practitioners. The purpose of this elective is to provide students with a working understanding of the business and policies that drive the U.S. healthcare system. The course structure is designed to be engaging with interactive case studies, small group discussion, and visiting faculty lecturers from the Duke-Margolis Center and Duke University's Fuqua School of Business. The 90-minute sessions will take place on weekday evenings in the Trent-Semans Center, once per month from September to April. Students are expected to attend or view a recording (with written summary) of 9/9 sessions. Student may utilize the "online view and review" option no more than three times. For more information, please contact Don Bradley (don.bradley@duke.edu) or Michel Landry (mike.landry@duke.edu). Credit: 1. Enrollment max: 115; min. 10. Note: credit will be awarded in the spring term. *Don Bradley, MD and Michel Landry, PhD*

INTERDIS-403C. Narrative Medicine for Medical Learners. This elective course is a fourth year clinical elective where students will discuss selected works of literature that address the human condition in a way that is meaningful to physicians-in-training. The course is open to third and fourth year medical students. The aim is to incorporate literature into the medical training experience, give students the opportunity to practice reflective writing, and the space to explore the humanistic roots of medicine. In this course we will examine the intersection between the domains of narrative and medicine through the study of diverse representations of medical issues. Among the questions we will ask are: how does narrative give us greater insight into illness, medical treatment, doctor-patient relationships, and other aspects of health and medicine? How do illness and other experiences within the realm of medicine influence ways of telling stories? How do doctors' perspectives and patients' perspectives differ, and what, if anything, should be done to close those differences? Attendance to all sessions is mandatory. However, with advanced approval from the course director, a student may miss one session, but the student must submit a written reflection of the readings for the missed session, as outlined by the course director, in order to receive credit for the course. This course will be offered during the first eight weeks of the spring term. Information regarding the day of the week that the course meets will be provided prior to spring term registration. Credit: 1. Enrollment Max:10; Min. 6. *John A. Vaughn, MD*

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 12 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. This fourth year elective was approved, effective spring 2013, for third and fourth year medical students. Third year students must obtain mentor approval. Credit: 1 Enrollment - up to 30 students. *Dennis Clements, MD/PhD*

INTERDIS-423C. Honduras Trip. A 10 day trip to Honduras is planned to begin the end of April 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 in the Gracias area during 6 days of the trip. A trip to Copan and an indigenous Mayan community is also planned. 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. This fourth year elective has also been approved to be taken by third year medical students, effective Spring 2013. However, third year students MUST obtain permission from their mentor, study program director, and advisory dean, (Prior to the trip) to be away for 10 days. ORIENTATION AND SELECTION FOR THIS TRIP TAKES PLACE IN OCTOBER THROUGH A SEPARATE EMAIL REQUEST. Permission of the instructor is required for the trip. Credit 1. Enrollment up to 15. Instructor - *Dennis Clements, MD/PhD*

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 an ACLS and/or PALS provider course. For more information, students should contact Dr. Timothy Scialla via email at timothy.scialla@duke.edu or Dr. Aimee Chung (aimee.chung@duke.edu). This is a longitudinal course. Students must enroll in the course for the fall term and select "0" credits. They also enroll for the spring term and select 4 credits. A grade of "Z" (Z = look to next term) will be entered for the first term of enrollment. The grade and credits will be awarded in the spring term. If you have additional questions, please contact SOMCapstone@duke.edu. Credit: 4. Enrollment max. 125. *Timothy Scialla, MD and Aimee Chung, MD*

Medicine

Interim Chair: Joseph G. Rogers, MD
Assistant: Judy Darnell
Vice Chair, Administration: Cathy Wood, MBA
Campus PO Box: 3703
Phone: (919) 668-1755
Fax: (919) 681-5400

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 patients. Functioning within teams 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. 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. Students are expected to 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. Methods of assessment include clinical evaluations by residents and attendings, a clinical performance exam, ECG interpretation exam, online case-based examination, and the NBME Medicine shelf exam. Credit: 8. *Saumil Chudgar, MD; Anna Lisa Crowley, MD; and staff*

MEDICINE-206C. Primary Care Leadership Track (PCLT) - Medicine. 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 patients. Functioning within teams 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. 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. Students are expected to 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. Methods of assessment include clinical evaluations by residents and attendings, a clinical performance exam, ECG interpretation exam, online case-based examination, and the NBME Medicine shelf exam. Credit: 8. *Saumil Chudgar, MD; Anna Lisa Crowley, MD; and staff*

MEDICINE-209C. Longitudinal Integrated Curriculum - Medicine. 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 patients. Functioning within teams 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. 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. Students are expected to 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. Methods of assessment include clinical evaluations by residents and attendings, a clinical performance exam, ECG interpretation exam, online case-based examination, and the NBME Medicine shelf exam. Credit: 8. *Saumil Chudgar, MD; Anna Lisa Crowley, MD; and staff*

Second Year, Two-Week Clinical Selectives

MEDICINE-221C. 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 should contact Jennifer Bowen (Jennifer.bowen@duke.edu) for questions about where to report and their schedules prior to the first day of classes. Primary Contact: Jason A. Webb, MD (jason.webb@duke.edu) Secondary contacts: Jennifer Bowen (jennifer.bowen@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. *Jason A. Webb, MD*

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. *Darin Dufault, 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—Not currently offered.*

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. Liza *Genao, MD; Mitch Heflin, MD, MHS; Michele Burgess, MCRP (Geriatrics selective program coordinator); Gwendolen Buhr, MD, MHS, CMD, MEd; Jeanette Stein, MD; Heidi White, MD, MHS, CMD, MEd; Mamata Yanamadala, MBBS*

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 Lehrich, MD*

MEDICINE-231C. Introduction to Infectious Diseases. The Infectious Disease (ID) Elective will give second year medical students the opportunity to gain exposure to and participate in care of patients on the Duke Hospital ID service. They will work as a part of the team taking part in the care of patients with a wide variety of infectious diseases in the inpatient and outpatient settings of critical illness. This patient population spans a wide range of disease causes, both common and rare, including iatrogenic, transplant, immunosuppression induced, HIV, community acquired, and drug-resistant cases. Unlike the 4th year elective this selective course will allow student(s) extensive exposure to high maintenance Infectious Diseases experience in Transplantation. Students should report to the Infectious Diseases office in Hanes House, Room 163 at 8:00am on the first day of classes. Hours are 8:00am - 5:00pm, M-F. For more information, please contact Michelle Harris (michelle.a.harris@duke.edu). Requisite: Permission of Instructor is Required. Max. Enrollment: 1; Credit: 2. *John R. Perfect, MD*

Fourth Year Clinical Science Electives

MEDICINE-401C. Internal Medicine Sub-Internship (Duke/VA). (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 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. In order to drop the course, students must provide at least 14 days advanced notice and permission of instructor are required. Failure to do so will result in a grade of Incomplete ("I") or a Withdrawal ("W") may be assigned. Please contact Sheila Gainey at 681-5258 or via email at sheila.gainey@duke.edu for more information. Course is not available for visiting medical students. Credit: 5. Enrollment: max: varies by term. *Anna Lisa Crowley, MD, Saumil Chudgar, MD and staff*

MEDICINE-402C. Medical Sub-Internship 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 Nyasia Lloyd at 684-2287 or via email at nyasia.lloyd@duke.edu. Credit: 5. Enrollment: max 1. *Carlos DeCastro, MD and Medical Oncology staff*

MEDICINE-404C. Cardiac Care Unit Sub-Internship. (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 Sub-Internship (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. *Daniel Gilstrap, MD and critical care staff*

MEDICINE-406C. Intensive Care Medicine Sub-Internship (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 triage, resuscitation, 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 martha.carraway@va.gov or Sharon.waddell@va.gov ((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 by the on-service fellow or attending on the first day of the rotation at 0800 a.m., 5A (5th floor A wing), Durham VAMC, after emailing the course director at least two weeks before as a reminder of the start date. NOTE: Students must contact the course director at least 4 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. *Martha Carraway, MD and critical care staff.*

MEDICINE-407C. Sub-Internship 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. For more information, please contact Dr. Sarah Rivelli via email, sarah.rivelli@duke.edu (support staff – cc: mary.kirkley@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 Sub-Internship. (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. Course is not available for visiting medical students. Credit: 5. Enrollment: max 3. *Anna Lisa Crowley, MD, Saumil Chudgar, MD and staff—Not currently offered.*

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. Three major learning areas will be emphasized. 1) Procedures including thoracentesis, paracentesis, and lumbar puncture through participation and direct observation, simulation, and viewing of procedure videos. 2) Management of inpatients on the Hospital Medicine service. 3) Overnight patient care with Hospital Medicine attendings with the opportunity to participate in patient admissions, cross cover emergencies, and transitions of care. The course is a two-week course. When contacting the director with interest, please indicate if you prefer the first or second two weeks of the four week block. Prerequisite: Permission of course director is required. Contact saumil.chudgar@duke.edu to enroll. Enrollment Max: 2. Credit: 2. *Saumil Chudgar, MD, MS*

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 USPSTF 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, Duke Outpatient Clinic, and other community based offices spending one or more days per week seeing patients with a preceptor. The student with see patients at multiple different sites with multiple preceptors. Clinical sites are located both at Duke and in the surrounding communities. 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 (919) 660-6746 Credit: 1 (10 clinic sessions, 4 hours each session over a four week block) or 2 (20 clinic sessions, 4 hours over a four week block). Please note that this is a 1 or 2 credits only. Enrollment: max 1 student for 2 credits. *Kathleen Waite, MD; Susan Blackford, MD; Ranee Chatterjee, MD; Eve Lausier, MD; Kevin Shah, MD; William Yancy, MD; and other outpatient faculty*

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; William Yancey, MD/MHS*

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. The classes meet once weekly from 5:00p - 7:30p. Students should contact Dr. Saumil Chudgar at saumil.chudgar@duke.edu to obtain a permission number. Credit: 1. Enrollment: max 12, min 6. *Saumil Chudgar, MD, MS*

MEDICINE-423C. Rheumatology. (1) Course Goals: For students to learn 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 and other inflammatory diseases such as lupus and other connective tissue diseases, 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: Three weeks of the rotation are spent in the Duke Rheumatology faculty clinics located in Duke South Clinics and in our Brier Creek (Raleigh) location. One week is spent as part of the rounding team on the Duke Hospital inpatient rheumatology consultation service. Students may also see outpatients at the Durham VA Medical Center. The inpatient consultation team includes a faculty member, a fellow, and a student. Students are expected to perform one new inpatient consultation each day. Rounds focus on oral presentation of patients including detailed review of history, physical examination findings, pertinent laboratory, x-ray and pathological findings. Students attend divisional conferences including weekly Rheumatology and Immunology Grand Rounds, Rheumatology Fellows' Core Curriculum Conference, Journal Club, and Rheumatology/Radiology Conference. Students are expected to watch two introductory videos, one on the approach to the rheumatology patient and one on the rheumatologic musculoskeletal examination. Students are also expected to watch at least 15 ten minute voice-annotated presentations on the most common rheumatologic diagnoses. For each learning module, students record 3 learning points and come up with 3 questions. These 3 questions and learning points are discussed in a weekly meeting with the course director or a designated faculty member or senior fellow. Justification for a grade of "honors" includes the following: Evidence through direct observation of house officer-level clinical skills in rheumatology; evidence of timely completion of learning modules, demonstrated by 1) active participation in and preparation for weekly meetings and 2) completion of the log of learning points and questions; 3) attendance at conferences listed above; 4) evidence of additional reading through case presentations to faculty members; 5) faculty evaluations; 6) 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. (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 conference attendance. For more information, please contact Dr. Criscione-Schreiber (crisc001@mc.duke.edu) Students may also contact Nyasia Lloyd (nyasia.lloyd@duke.edu). 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. *Lisa Criscione-Schreiber, MD/MEd; Nancy Allen, MD; David Caldwell, MD; Megan Clowse, MD/MPH; Jay Doss, MD; Michael Hershfield, MD; Kim Huffman, MD; Rob Keenan, MD/MPH; Virginia Kraus; David Pisetsky, MD/PhD; Jennifer Rogers, MD; Ankoor Shah,MD; Steve Sorin MD; William St. Clair, MD; Terri Tarrant, 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. This course will be of value to just about any student who plans to take care of patients. Students must verify that there is no time conflict with other courses offered during the same time period. For more information please contact Dr. Michael Berkoben via email at michael.berkoben@dm.duke.edu or Dr. John Roberts via email at john.roberts@duke.edu. Credit: 1. Minimum Enrollment: min: 8; max: 30. *Michael Berkoben, MD; John Roberts, MD; and Ruediger Lehrich, 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 inpatients 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 Nyasia Lloyd at 681-4510, or by email at nyasia.lloyd@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. The classes meet once weekly from 5:00pm - 7:30pm. Contact saumil.chudgar@duke.edu to enroll. Credit: 1. Enrollment Max: 12 Minimum: 6. *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. 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: Jennifer Bowen (jennifer.bowen@duke.edu) or William English (william.english2@duke.edu) or (919) 668-7215. Permission is required. Credit: 2. Enrollment max: 2. *Jason A. Webb, MD; Anthony Galanos, MD; Nathan Gray, MD; Kristin Meade, MD; J. Trig Brown, 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 and Kaitlyn Wilson at kaitlyn.ford@duke.edu. Secondary contact: Dr. Spratt (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). Please contact Dr. Baker for meeting dates/times. Students must attend all sessions in order to receive credit. Evaluation will be based on class participation, brief reflections, and a final 20-min historical presentation. Third year students must obtain permission of their mentor in order to take the course. Permission of instructor is required: contact jeffrey.baker@dm.duke.edu. Credit: 1. Enrollment max: 10; min: 5. *Jeffrey P Baker, MD*

MEDICINE-430C. Pulmonary Medicine. (1) Course Goals: 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 are assigned to the Pulmonary Inpatient and Consult Services 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 throughout the rotation in several half-day outpatient subspecialty clinics each week (Cystic Fibrosis; Interstitial Lung Disease; Pulmonary Hypertension; Lung Transplant; Pulmonary Rehabilitation). At the start of the rotation, students have the opportunity to personalize which of these clinics they wish to attend. Students are expected to attend the following conferences at Duke Hospital during their rotation unless clinical duties supersede: Tuesday Fellow's Lecture series, Wednesday Chest Conference; and Thursday ILD conference. Students are otherwise encouraged to attend General Medicine Noon Conferences. (3) Methods of Evaluation: Formative feedback: It is expected that students seek out personalized feedback at least weekly to bi-monthly with both the fellow and faculty on the rotation. Also, students will take a pre and post-test (20 questions) on Pulmonary Medicine. This will be strictly for self-assessment and will not be factored into their final grade. Summative feedback: Student summative evaluations are done by fellows and faculty assigned to the Consult Services during the period of the course and is based on observed performance in regards to patient presentations, participation during rounds, and oral presentations on self-selected pulmonary topics Questions should be directed to Gina Brewer, via email at gina.brewer@duke.edu or by phone at 684-6143. Dr. Scialla can be reached via email at timothy.scialla@duke.edu. Secondary physician contact: Harvey Marshall, MD. Credit: 4. Enrollment: max 1. *Timothy Scialla, 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: Jason Bullock at (919) 613-5707. Credit: 4. Enrollment max: 1. *Patricia Lugar, MD; Anjeni Keswani, MD; and Ankoor Shah, MD*

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 Nyasia Lloyd 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. Credit: 4. Enrollment: max 2. *Darin Dufault, 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 Nyasia Lloyd at 684-2287 or via email at nyasia.lloyd@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 Bahnson, 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 Kerri Pulliam-Ottwell at 681-1370 or you may contact her via email,kerri.pulliam@dm.duke.edu. Credit: 4. Enrollment: max 2. *Chetan B. Patel, 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 (unless otherwise noted). *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 will round on three major nephrology services: the Acute Service which cares balanced exposure to all facets of nephrology including patients in the intensive care units at Duke, the Transplant Service which focuses on patients with kidney or combined kidney-pancreas transplants, and the Maintenance Dialysis Service which provides care to patient with end stage renal disease. 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 660-6865. 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-447C. Practitioners and Patients: The History of Clinical Medicine. How has the physician-patient relationship changed over time, and what are its possibilities for the future? This class will consider these questions using a variety of sources including medical memoirs, patient narratives, short stories, and other media. We will identify the critical historical processes (scientific, social, and cultural) that account for the structure of medical practice today, as well as examine the ethical tensions and controversies that have resulted. Priority given to MS3 students; class may be taken individually or as part of longitudinal MS3 medical humanities sequence. (Students may not take this seminar and MED 429C-81, History of Medicine for Clinicians). Location to report on the first day: Conference Room, Trent Center for Bioethics, Humanities, and History of Medicine, Room 108 Seeley G Mudd Building (Medical Center Library). Classes will meet on Tuesday evenings 5:15pm - 7:15pm. Permission of instructor is required for enrollment - students must obtain permission number from the course director. Third Year students must also obtain email approval from their mentor. The email approval from the mentor should be sent to thirdyear@dm.duke.edu and the course director. Enrollment Max: 16; Enrollment Min: 8. Credit: 1. Offered during fall section 82. *Jeffrey P. Baker, MD/PhD; Margaret Humphreys, PhD*

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 Dr. Liza Genao at (919) 970-8965 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 Dr. Genao 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. Course contact: Dr. Liza Genao, (liza.genao@duke.edu). Secondary contact: Dr. Gwendolyn Buhr (gwendolen.buhr@duke.edu). Credit: 4. Enrollment: max 1. *Liza Genao, MD; Gwendolen Buhr, MD; Mitchell Heflin, MD/MHS; Kenneth Lyles, MD; and other staff*

MEDICINE-452C. Clinical Medical Ethics: What Would a Good Physician Do? What is medicine for? What standards and norms reasonably guide physicians' actions? This course will consider rival answers to these questions, and then follow clinical ethical cases to grapple with questions about: the clinician-patient relationship, the limits of medicine, the meaning of autonomy, the place of judgment in the physician's work, the difference between an intended effect and a side effect, proportionality, sexuality and reproduction, the beginning of life, disability, end-of-life care, and death. Priority given to MS3 students; class may be taken individually or as part of longitudinal MS3 medical humanities sequence. Permission of the Instructor is Required - Permission number must be obtained from the course director. Third year students must also obtain approval of their mentor in order to take the course. Email approvals should be sent to thirdyear@dm.duke.edu and the course director. Meeting Location: Conference Room, Trent Center for Bioethics, Humanities, and History of Medicine, Room 108 Seeley G Mudd Building (Medical Center Library). To be held Tuesday evenings, 5:15pm, -7:15pm. Credit: 1. Enrollment Max: 16; Enrollment Minimum: 8. *Farr A. Curlin, MD; Gopal Sreenivasan, MD; Ray Barfield, MD; Warren Kinghorn, MD; and Philip Rosoff, MD*

MEDICINE-453C. Medicine, Humanities and the Arts. How do the humanities and the arts help us understand the human experience of illness, suffering, and dying? How does skilled storytelling improve our ability to guide families facing complicated decisions and uncertainty? Can literature improve our ability to care for patients from different cultures and backgrounds? Drawing on a wide range of disciplines in the humanities, this course will emphasize concrete ways in which the humanities and the arts can teach us to be better doctors. Priority given to MS3 students; class may be taken individually or as part of longitudinal MS3 medical humanities sequence. Pre-requisite: Permission of the Instructor is required - Instructor must provide permission number. Third year students must also obtain email approval from their mentors in order enroll. The email approval should be sent to the thirdyear@dm.duke.edu and to the course director. Enrollment Max: 16; Minimum Enrollment: 8. Credit: 1. Offered spring 82. Wednesday Evenings, 5:15pm - 7:15pm. *Raymond Barfield, MD/PhD, and John Vaughn, MD*

Neurology

Chair: Richard J. O'Brien, MD, PhD
Assistant: Evelyn Morgan
Business Manager: JT Solomon
Campus PO Box: 2900
Phone: (919) 684-0053

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*

NEURO-209C. Longitudinal Integrated Curriculum - Neurology. This basic required course provides an introductory to clinical neurology with a focus of learning neurological symptoms, signs, and diseases. With this course, students will learn and hone the neurological examination and integrate this in clinical practice moving forward. For this clerkship, there will be an intensive two-week inpatient clinical experience. LIC students will participate in the case discussions, neurology on-call, and neurology lectures. LIC students will see neurologic cases in their other outpatient clinics, in Urgent Care, and the Emergency Room shifts. These outpatient clinical experiences will provide further instruction of neurological illnesses, diagnostic tools needed to diagnosis these illnesses, and treatments for this diseases. Secondary Contact: Chris Berry (Christine.berry@duke.edu) Credit: 4. *Vern Juel, MD*

Second Year, Two-Week Clinical Selective

NEURO-220C. Neurocritical Care. The Neurocritical Care Elective will give second year medical students the opportunity to gain exposure to and participate in care of patients in the Neurologic ICU. They will work as a part of the multidisciplinary team taking part in the care of patients with a wide variety of neurologic processes, both common and rare, and is a burgeoning field of active research amongst neurosurgeons, neurologists and intensivists. For more information about the course and to obtain a permission number, required to take the course, contact Dr. Julian Yang at julian.yang@duke.edu. Credit: 2. Enrollment: 1. *Julian Yang, MD; Daniel Laskowitz, MD, MHS; Keith Dombrowski, MD*

Clinical Science Electives

NEURO-401C. Neurology Sub-Internship. (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: Neuro 205C or 402C. Permission is required. Credit: 5. Enrollment: max 2. *Vern Juel, MD; Vani Chilukuri, MD, Jodi Dodds, MD; Keith Dombrowski, MD; Christopher Eckstein, MD; Carmelo Graffagnino, MD; F Lee Hartsell, MD; Jodi Hawes, MD; Brad Kolls,MD; Daniel Laskowitz, MD; Joel Morgenlander, MD; Mark Skeen, MD; Shreyansh Shah, MD; Christa Swisher, MD; and Julian Yang, MD*

NEURO-402C. Neurology Clerkship. This course is restricted to those students who did not take a Neurology clerkship (Neuro 205C or 206C) 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 neuroanatomy, 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. Permission is required. Credit: 4. Enrollment: max 1. *Vern Juel, MD and neurology faculty*

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 or more specific subspecialty in neurology and attends clinics for approximately 4 days per week. 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, headache/pain, memory disorders, movement disorders, and neuromuscular disorders are available. Appropriate reading material is utilized to complement the clinical experience. Neuro 205C, 206C, or 402C 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 more information, please contact Christine Berry, 613-0314 or via email, christine.berry@duke.edu. VA student credentialing is required prior to registration. Permission is required.

Credit: 1-2. Enrollment: max 3 (if participating in different subspecialties). *Vern Juel, MD; Richard Bedlack, MD, PhD; James Burke, MD, PhD; Timothy Collins, MD; Jeffrey Cooney, MD; Karissa Gable, MD; Jeffrey Guptill, MD; Jodi Hawes, MD; Lisa Hobson-Webb, MD; Aatif Husain, MD; Janice Massey, MD; Rodney Radtke, MD; Burton Scott, MD, PhD; Saurabh Sinha, MD, PhD; and Tung Tran, 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 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 Sampson, MD, PhD
Assistant: Tami Tuck
Business Manager: Kathy Tobin

Second Year, Two-Week Clinical Selective

NEUROSUR-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, 8:00 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. Secondary contact: Sherolyn Patterson, (sherolyn.patterson@dm.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. *Carrie Muh, MD*

Clinical Science Electives

NEUROSUR-401C. Sub-Internship in Neurological Surgery. This course is designed for those students with a career interest in neurological surgery. Duties include the work-up and care of inpatients, evaluation of clinic patients, assistance in the operating room, daily rounds, and approximately every 3rd-night call. Students will be expected to assume intern-level responsibilities. Students round with the neurosurgical team in the mornings then participate in the OR or attend one of the neurosurgery clinics after rounds. Students attend the Wednesday academic day neurosurgical conferences covering topics within neurosurgery, neurology, neuropathology and neuroradiology, as well as twice monthly Brain School conferences. For more information and to obtain permission numbers, please contact Sherolyn Patterson at 684- 3053 or contact her via email, sherolyn.patterson@duke.edu. First Day of Classes: students are to meet promptly at 6:00a.m., 8th floor (Neuro ICU) at Duke Medical Pavilion. NOTE: Students completing this subinternship may complete rotations at VA Medical Center and must complete required paperwork no later than 60 days prior to the start of the section in which they are enrolled. Credit: 5. Enrollment max: 5. *Carrie Muh, MD (course director); John Sampson, MD,PhD (Chairman); Allan Friedman, MD; Patrick Codd, MD; Peter Fecci, MD; Herbert Fuchs, MD,PhD; Fernando Gonzalez, MD; Oren Gottfried, MD; Erik Hauck, MD; Michael Haglund, MD,PhD; Robert Isaacs, MD; Isaac Karikari, MD; Nandan Lad, MD,PhD; Anna Terry, MD; Eric Thompson, MD; Dennis Turner, MD; and Ali Zomorodi, 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. Most students attend Monday - Friday for half days beginning at 6:00am. For more information please contact Sherolyn Patterson at 684-3053 or via email, 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. Enrollment max: 2. *Carrie Muh, MD (course director); John Sampson, MD,PhD (Chairman); Allan Friedman, MD; Patrick Codd, MD; Peter Fecci, MD; Herbert Fuchs, MD,PhD; Fernando Gonzalez, MD; Oren Gottfried, MD; Erik Hauck, MD; Michael Haglund, MD,PhD; Robert Isaacs, MD; Isaac Karikari, MD; Nandan Lad, MD,PhD; Anna Terry, MD; Eric Thompson, MD; Dennis Turner, MD; and Ali Zomorodi, 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. 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. Permission is required. Credit: 4 credits. Enrollment max: 1 student. *Katy Peters, MD; PhD; Other faculty: Annick Desjardins, MD; Margaret Johnson, MD; Dina Randazzo, DO; Henry Friedman, MD; Allan Friedman, MD; and John Sampson, MD/PhD. Students will also interact with staff in the Brain Tumor Clinic and Neuro-Oncology Fellows*

Obstetrics and Gynecology

Chair: Matthew D. Barber, MD/MHS
Assistant: Laverne Alston
Business Manager: Jim Morgridge, MBA, CPA
Campus PO Box: 3084
Phone: (919) 668-3948
Fax: (919) 668-5547

Required Courses

OBGYN-205C. Obstetrics and Gynecology. This second year clerkship is required of all second-year students in the 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 and 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*

OBGYN-209C. Longitudinal Integrated Curriculum - Obstetrics & Gynecology. This second year clerkship is required of all second-year students in the Longitudinal Integrated Clerkship. The course consists of an inpatient and outpatient obstetrics and gynecology. Students attend lectures, work daily in the general and special outpatient clinics, and are assigned patients on obstetric and gynecologic wards. Students share in patient care, teaching exercises, and in daily tutorial sessions with faculty. Clinical conferences, a gynecologic-pathology conference, endocrine conferences, and correlative seminars and lectures are included. Secondary Contact: Jade Arnold (jade.arnold@duke.edu). 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 Diagonostic Center is located at Lofts at Lakeview, 2608 Erwin Road, Suite 200 (above Chipotle Grill) - 8:15 a.m. 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. Permission of the instructor is required for 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 or you may contact Jordan Toole (jordan.toole@duke.edu). *Suheil Muasher, MD*

Clinical Science Electives

OBGYN-404C. Preparation for ObGyn Residency. This two-credit course is designed to build on the foundation laid in the Capstone Course to further prepare students specifically for OB/GYN residency, though it is open to other students as well. Emphasis is placed on knowledge/skills necessary to succeed as PGY-1. Coursework includes high yield patient management didactics, review of common obstetric and gynecologic surgeries and procedures, critical appraisal of the literature / journal club, basic surgical skills (gowning, gloving, prepping, draping, suturing, knot tying), simulation of obstetric emergencies, practice pages, and Resident-as-teacher sessions, as well as time to work directly with faculty and residents. The course will be graded Credit/No Credit. Credit 2. Enrollment max 20; Enrollment Min: 2. Students should meet at 248 Baker House on the first day. For questions about the time to meet, and/or the class dates in April, please contact Dr. Sarah Dotters-Katz (sarah.dotters-katz@duke.edu). *Sarah Dotters-Katz, MD, Beverly Gray, MD, and associated departmental faculty*

OBGYN-405C. Gynecologic Cancer Sub-Internship. 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. The student should report to the 6300 work room at 6:00am. Credit: 5 Enrollment: max 1. *Andrew Berchuck, MD; Brittany Davidson, MD; Laura Jean Havrilesky, MD; Paula Sowon Lee, MD; Rebecca Previs, MD; Angeles Alvarez Secord, MD; Kim Nolte, PA-C; and gynecologic oncology fellows*

OBGYN-407C. Female Pelvic Medicine and Reconstructive Surgery Sub-Internship. 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 Urogynecologic 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 Uroynecology Division with similar interests. Credit: 5. Enrollment: max 1. Contact: alison.weidner@duke.edu. Enrollment Max. 1; Credit: 5. Prior to

the first day, the student should contact Cynthia Paylor, Duke Urogynecology, 5324 McFarland Drive, Suite 310, Duke Medicine Patterson Place, Durham, NC 27707; Phone: (919) 401-1001. Students meet at the Patterson Place location at 8:30am on the first day of the rotation. *Alison Weidner, MD; Cindy Amundsen, MD; Matthew Barber, MD/MHS; John Jelovsek, MD; Amie Kawasaki, MD; Nazema Siddiqui, MD; Anthony Visco, MD; and urogynecology fellows*

OBGYN-431C. Clinical Reproductive Endocrinology and Infertility. This 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 Jordan Toole (jordan.toole@duke.edu) or Anne Wade at (919) 684-4673 or via email, anne.wade@dm.duke.edu. Permission of the instructor is required for enrollment. Credit: 4. Enrollment: max 1. Suheil Muasher, MDEnrollment: max 1. *William Hurd, MD*

OBGYN-447C. Clinical Obstetrics Sub-Internship. This course is 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 house staff and faculty in the inpatient and outpatient arenas. Opportunities for experience in prenatal ultrasound, diagnosis and genetic counseling available. Meet on the 5th floor of Duke Hospital, L&D workroom at 6:45AM on the rotation's first day (rounds begin at 7:10AM). For more information, please contact Dr. Sarah Dotters-Katz at sd132@duke.edu. Secondary contact: Jordan Toole at 613-5156 or jordan.toole@duke.edu. Credit: 5. Enrollment: max 2. *Dr. Sarah Dotters-Katz, MD*

Ophthalmology

Chair: Edward Buckley, MD
Assistant: Michele Clifton
Business Manager: Adrienne Lloyd
Campus PO Box: 3802
Phone: (919) 684-5846
Fax: (919) 681-6343

Second Year, Two-Week Clinical Selective

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, strabmismus, glaucoma, and vitreoretinal disease). There will be didactic instruction and case-based learning with patient care exposure in the clinic setting and operating room. Credit: 2. Enrollment max. 5. Location: Lobby of Eye Center. Please contact Dexter Torain at (919) 684-9855 for more information. *Jullia Rosdahl, MD*

Clinical Science 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 Hudson Building, Room 4510 A/B, 4th floor, every Tuesday and Thursday from 12 to 1pm. For more information students may contact Dexter Torain at (919) 684-9855. Credit: 1. Enrollment: min 8, max 20. *Jullia Rosdahl, 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 2nd floor lobby of the Duke Eye Center, Hudson Building @ 8:30am to see Dexter Torain at (919) 684-9855. 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. *Jullia Rosdahl, 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; and Grace Parkalapakorn, MD*

Optional Research Studies

OPTRS-101B. Optional Research Studies. (First Year). Optional Research Studies is a semester term-based, non-credit 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, insurance and financial aid for living expenses. A continuation fee is charged for this status. No Credit.

OPTRS 301B. Optional Research Studies. (Third Year). Optional Research Studies is a semester term-based, non-credit 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, insurance and financial aid for living expenses. A continuation fee is charged for this status. No Credit.

OPTRS-401C. Optional Research Studies. (Fourth Year). Optional Research Studies is a semester term-based, non-credit 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, insurance and financial aid for living expenses. ORS should be due to an extension of the third year research into a new area of investigation due to a change of career plans or a desire to enhance research skills, not to delay graduation. A continuation fee is charged for this status. No Credit.

Orthopaedic Surgery

Chair: Ben Alman, MD
Assistant: Melanie Frank
Business Manager: Mike Gagnon
Campus PO Box: 2888
Phone: (919) 684-2894
Fax: (919) 681-8377

Second Year, Two-Week Clinical Selective

ORTHO-221C. Physical Medicine and Rehabilitation. Physical Medicine & Rehabilitation is the medical specialty that focuses on treating patients with physical disabilities, whether it be from stroke, sports injury, spinal cord injury, traumatic brain injury, or congenital musculoskeletal conditions. PM&R physicians are known as physiatrists. Physiatrists focus on a holistic approach to healthcare, focusing on how to improve a patient's function and manage their pain. Physiatrists often lead interdisciplinary rehabilitation teams and work closely with neurologists, psychiatrists, and orthopedic surgeons. Thus, students who participate in this selective will take part in a collaborative practice, build on their medical knowledge, and develop basic MSK and neurological exam skills. Students must report to their designated assignments (VA, Duke North, NCOC) on the first Monday of the section at 8:00am. The class meets M-F, 8am - 5pm. Students attend Grand Rounds on Wednesday from 6:30am - 7:30am (Bryan Center). Enrollment Max. 2; Credit: 2. *Anand Joshi, MD, MHA; Paul Tawney, MD; Paul Howell, MD; Gloria Liu, MD; and Michael Guo, MD/PhD*

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 email at wendy.thompson@duke.edu. Credit: 2, Enrollment max: 3. *Samuel D. Stanley, MD*

Clinical Science Electives

ORTHO-402C. Orthopaedic Surgery Basic Skills. This comprehensive review of the musculoskeletal examination and basic surgical principles and skills is pertinent to the care of the orthopaedic patient. Each morning, clinical evaluation and rehabilitation strategies of musculoskeletal conditions including the spine, upper and lower extremities will be taught through small group and mentorship models and reinforced through patient clinical assessments. Key elements of history taking, clinical observation and assessments, diagnostic and therapeutic injection techniques, and basic imaging skills, including musculoskeletal ultrasound, will provide a foundation on which subsequent clinical rotations can be enhanced. In the afternoon, the student will participate in basic surgical skills sessions as part of the Orthopaedic Surgery Residency CORE curriculum. These hands-on sessions will include basic operating room principles (sterile set up, teamwork, leadership in the OR), basic surgical skills (suturing, wound care, local and regional anesthesia, intravenous access, perioperative management, etc.), and basic orthopaedic principles (splinting and casting, dressing application, traction, and halo application, principles of external and internal fixation). For more information about the course and to obtain permission to take the course contact Wendy Thompson (wendy.thompson@duke.edu). This course is only available to students in approved Accelerated Pathways in Orthopaedics program. Credit: 4. Enrollment Max: 2, Min:1. *Anand Joshi, MD; Brian Brigman, MD; Blake Boggess, DO; Paul Tawney, MD; Jeffrey Bytomski, MD; Tracy Ray, MD; and other orthopaedic faculty pertinent to surgical skills*

ORTHO-403C. Orthopaedic Surgery - Community Orthopaedics I. This is the first of two, one-week community rotations in this program. This one-week experience in orthopaedic surgery at Duke Raleigh Hospital provides medical students with exposure to a multi-specialty, community-based practice, emphasizing the management of common conditions and the structure of a private practice. In a supervised role, students will participate in the evaluation and management of common orthopaedic conditions including history taking, clinical examination, diagnostic test interpretation, and surgery. A mentorship model with members of Duke Orthopaedics at Raleigh will permit experience in both the office and surgical settings. Students will participate in the CORE Orthopaedic Surgery Residency curriculum conferences and basic skills labs, as schedule permits. Student is to contact Program Coordinator, Emily Berthold, one week prior to the start of the course for instructions and for the course schedule at emily.berthold@duke.edu. This course is only approved for students that are in the Accelerated Pathways in Orthopaedics Program. Permission of the instructor required. Credit 1. Enrollment max:2; min: 1. *Erica Taylor, MD; Karl Schweitzer, MD; Don O'Malley, MD; Rob Lark, MD; Phillip Horne, MD; Andre Grant, MD*

ORTHO-404C. Orthopaedic Surgery - Community Orthopaedics II. This is the second of two, one-week community experiences in this rotation. This one-week orthopaedic surgery at Duke Raleigh Hospital provides medical students with exposure to a multi-specialty,

community-based practice, emphasizing the management of common conditions and the structure of a private practice. In a supervised role, students will participate in the evaluation and management of common orthopaedic conditions including history taking, clinical examination, diagnostic test interpretation, and surgery. A mentorship model with members of Duke Orthopaedics at Raleigh will permit experience in both the office and surgical settings. Students will participate in the CORE Orthopaedic Surgery Residency curriculum conferences and basic skills labs, as schedule permits. This course is approved only for the students that are in the Accelerated Pathways in Orthopaedics program. Student is to contact Wendy Thompson (wendy.thompson@duke.edu) one week prior to the start of the course for instructions. This course is only approved for students that are in the Accelerated Pathways in Orthopaedics Program. Permission is required. Credit 1. Enrollment Max: 2, Min:1. *Erica Taylor, MD; Karl Schweitzer, MD; Don O'Malley, MD; Rob Lark, MD; Phillip Horne, MD; Andre Grant, MD*

ORTHO-405C. Basic Arthroscopy & Arthroplasty. This four-week introductory course based at the Durham VA Medical Center and the Duke University Hospital focuses on upper and lower extremity arthroscopy and arthroplasty. The course emphasizes topics fundamental to orthopaedics: (1) the evaluation and management of joint injuries and degenerative conditions; (2) the consideration of indications, contraindications, patient assessment, patient education, inherent risks and benefits of treatment related to arthroscopy and arthroplasty. In a supervised role, students will participate in clinical assessments, diagnostic test interpretation, inpatient care rounds, and surgery. Students will participate in the CORE Orthopaedic Surgery Residency curriculum conferences and basic skills labs. Student is to contact Wendy Thompson, (wendy.thompson@duke.edu) one week prior to the start of the course for instructions and for the course schedule. This course is approved for only those students in the Accelerated Pathways in Orthopaedics program. Permission is required. Credit: 1. Enrollment max: 2, min: 1. *Brian Brigman, MD; Chad Mather, MD; Grant Garrigues, MD; Samuel Wellman, MD; Michael Bolognesi, MD; David Attarian, MD; Thorsten Seyler, MD; William Garrett, MD*

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. Permission is required. Credit: 3. Enrollment: maximum 2 students per four week section. *Robert D. Zura, MD; Duke Orthopaedic Staff*

ORTHO-429C. Sub-Internship 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. 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 sub-internship experience. Permission is required. Credit: 5. Enrollment: max 4 for 4 weeks. Summer section 41, maximum of 2 students. Interested visiting students must contact the Visiting Student Coordinator, scott.campbell@duke.edu, to inquire about the process for applying. *Richard Marc, 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. Permission required. Credit: 4; Enrollment max: 1. Prerequisite: Ortho 429C. Claude T. Moorman, III, MD; *Grant Garrigues, MD; Richard Mather, MD; William Garrett, 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. Permission Required. Credit: 4. Prerequisite: Ortho 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. Prerequisite: Ortho 429C. Permission is required. 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. Prerequisite: Ortho 429C. Permission is Required. Credit: 4. Enrollment max: 1 *Robert Fitch, MD; and Robert Lark, MD*

Pathology

Chair: Jiaoti Huang, MD, PhD
Assistant: Patricia Lea
Business Manager: Liz Polley
Campus PO Box: 3712
Phone: (919) 684-9929
Fax: (919) 681-0778

Second Year, Two-Week Clinical Selective

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. 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 (less than 30 min) orientation. Contact: please email Dr. Buckley at patrick.buckley@duke.edu should you have questions. *Patrick Buckley, MD/PhD*

Clinical Science 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., meridith.hennessey@duke.edu. Credit: 4. Enrollment: max 2. *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. Hall prior to starting rotation, (613-7396) or allison.hall@duke.edu. Secondary contact: Rosa Johnson, (919) 681-1563. Students meet on the first day at Dr. Hall's office, 3093, Duke South, Yellow Zone, 3rd floor at 9:00 a.m. Credits: 4. Enrollment: max 2. *Allison Hall, MD and staff*

Pediatrics

Chair: Ann M. Reed, MD
Assistant: Theresa Harris
Business Manager: Susan Kline
Campus PO Box: 3352
Phone: (919) 681-4080
Fax: (919) 681-2714

Required Courses

PEDS-205C. Pediatrics. The basic course in pediatrics for all students is a six-week clerkship in the second year. Students will acquire skills and knowledge in the care of pediatric patients which they will apply across clinical settings. Primary goals of the Clerkship are to teach students skills in the care of the well child, care of the acutely ill child, care of the chronically ill child, and care of the hospitalized child. Students will accomplish these goals through structured clinical experiences as well as regular teaching sessions. Clinical experiences include one week of clinic (including pediatric urgent care, emergency care, and well child care), one week of nursery (Duke Regional Nursery or Duke Nursery), and four weeks of inpatient wards (each student will rotate through general inpatient days, general inpatient nights, and subspecialty pediatrics days for a comprehensive exposure to general and subspecialty pediatrics). The primary mode of learning is in provision of patient care in the structured clinical experiences, with real time teaching, coaching, and feedback by clinical supervisors. The goal is for students to demonstrate ownership and advocacy for their patients in a team-based setting, with excellence in pediatric history taking, exams, differential diagnosis, clinical reasoning, presentations, and execution of patient care with strong professionalism. Students will be provided structured, consistent teaching sessions with pediatric faculty, and will be provided access to the foundational national pediatric curriculum. 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. Credit: 6. *Aditee Narayan, 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. *Aditee Narayan, MD*

PEDS-209C. Longitudinal Integrated Curriculum. The basic course in pediatrics for all students is a 2-week inpatient clerkship and a longitudinal outpatient component in the second year. Its principle aim is to provide an exposure to the field of child health. The student will have a varying series of experiences to give them a grasp of the underlying concepts of the field. Goals include acquiring familiarity and competence with the basic tools of information-gathering (history, physical examination, and laboratory data) coupled with developing an approach to the integration of this material toward the solution of problems of health and illness in infancy, childhood, and adolescence. The course helps integrate the basic principles of pathophysiology encountered in the first year courses. The patients assigned to the student provide the focus for case studies. In addition to the careful recorded history and physical examination, the student is expected to develop an appropriate differential diagnosis 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 performed studies. The student is expected to learn from a number of sources: Internet accessible multimedia clinical cases, standard textbooks, journals, current publications, conferences, and with the house staff, faculty, nurses, parents, and others with whom contact is made in the clinical setting. Objectives also include an understanding of the roles played in pediatrics by other members of the health care team, both in the ambulatory and hospital settings. Credit. 6. *Aditee Narayan, MD*

Second Year, Two-Week 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 Center, Level 2, workroom D. Please email Dr. Marie McDonald the week before for the schedule. *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 Child Abuse and Neglect Medical Evaluation Clinic located at 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*

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: Room 4902 Children's Health Center. 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-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. *Sujay Kansagra, 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, may not be available during some sections. Location: Duke Health Center at Roxboro Street, 4020 N. Roxboro Street. PERMISSION OF INSTRUCTOR IS REQUIRED. Contact Dr. Chung for more information at richard.chung@dm.duke.edu. *Richard J. Chung, MD; Nirmish Shah, 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 Nicole Sall at (919) 668-2577. Students should meet on the 3rd floor of the Children's Health Center, Pediatric Gastroenterology clinic, at 9am. 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; Mary Boruta, MD and Alisha Mavis, MD*

PEDS-229C. Pediatric Congenital Cardiology. In Pediatric Congenital Cardiology, medical students will observe and participate in the care of a unique patient population through a multidisciplinary approach. Students will have the unique opportunity of caring for pediatric patients with congenital heart disease from an interventional side, a clinical side, and a surgical side. In doing so, they will get a brief introduction into the importance of a team approach to complicated medical decisions and procedures in a field at the cutting edge of modern medicine. Students should meet at Dr. Fleming's office at 7:30am on the first day, 7506 -C, Duke Hospital North, across from the pediatric cath labs. Please contact Dr. Fleming for the meeting time. Credit: 2. Enrollment: max 1, min 1. *Gregory Fleming, MD*

Clinical Science Electives

PEDS-401C. Pediatric Sub-Internship. 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. Joseph Jackson (joseph.jackson@duke.edu) to register for or to drop this course. Prior to the start of the sub-internship the name of the inpatient team will be provided to the students as well as details regarding Sub I Orientation activities. Permission of Instructor Required. Credit: 5. Enrollment: max: 4. *Joseph Jackson, MD; Aditee Narayan, MD ; Kamara Carpenter 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. Credit: 3-4. Enrollment max: 1. 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-403C. Med-Peds Ambulatory Rotation. Full immersion experience in outpatient adult and pediatric medicine. Students will see patients of all ages for a variety of visit types (follow-ups, physicals/well child checks, urgent care visits), hone their history and PE skills, formulate assessment and plans for common outpatient problems, gain an understanding of healthcare maintenance/preventive care, experience continuity of care, and learn about community resources in the outpatient setting. Enrollment Max: 1. Credit 3-4. Permission of instructor is required. Students should report to Duke Health Center, 4020 N. Roxboro Street, Durham, NC 27704 on the first day. Please contact Dr. Aimee Chung to confirm start time. *Aimee Chung, MD*

PEDS-404C. Advanced Adolescent Medicine. This elective will provide medical students with a foundational experience in the care of adolescents and young adults -- 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 and supervised study. Enrollment Max: 1; Credit. 2. Permission of instructor is required. On the first day of classes, students should meet at Duke Health Center, 4020 N. Roxboro Street. Please contact Dr. Richard Chung to confirm meeting time. *Richard Chung, MD; Nirmish Shah, MD; John Moses, MD; Betty Staples, MD, Gary Maslow, MD, Deborah Squire, MD, and Charles Wong, MD*

PEDS-408C. Advanced Adolescent Medicine. This elective will provide medical students with a foundational experience in the care of adolescents and young adults -- 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 and supervised study. Students should meet at the Duke Health Center at Roxboro Street, 4020 N. Roxboro Street, Durham, on the first day of classes. Please contact Dr. Chung for the time. Permission is Required. Credit: 2; Enrollment Max. 1. *Richard J. Chung, MD*

PEDS-409C. Pediatric Palliative Care and Quality of Life. This course provides an introduction to pediatric palliative care for 4th year medical students. The course aims to help students to hone their patient and family centered care skills, in particular communication (breaking bad news) and medical decision making. Course will also provide opportunity to learn fundamentals of symptom management such as pain, nausea and constipation. It enables students to identifying psychosocial distress, spiritual and cultural beliefs that will affect health care decisions. Students should meet at 9:00am in the Pediatric Intensive Care Unit on the first day of classes. However, please page the attending (970-4357) to verify. Permission is Required. Credit: 2; Enrollment Max. 1. *Ray Barfield, MD, PhD; Megan Jordan, 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: 3 to 4. Enrollment: max 1 per section. (C) Pediatric Pulmonary and Sleep Medicine - Richard Kravitz, M.D. 684-2289. Permission of Course Director Required; (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. Ellis via email approximately 1-to-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 no later than the time of his/her first scheduled shift. Students will be expected to work four 10-hour shifts per credit. Students are expected to attend required didactic sessions/activities during the entire 4-week block, even if scheduled for fewer than 4 credits. Required activities/didactics include trauma simulation (typically one Wednesday per month) and pediatric topics on variable Thursday mornings (if applicable). 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. Donald Ellis (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 DukeHub and you are interested, you are encouraged to contact Dr. Ellis (donald.ellis@duke.edu) to inquire. Permission is required. Variable Credit: 3-4 cr. Enrollment max: 2. *Donald Ellis, MD; James Fox, MD; William Bordley, MD/MPH; Linton Yee, MD; Emily Sterrett, MD/MS; Kathryn Crampton, MD; and Neel Subramanian, MD*

PEDS-420C. Introduction to Pediatric Infectious Diseases. This two-week course provides an exposure to the evaluation, diagnosis, management, and follow-up of patients with possible infectious diseases. Students will work closely with the pediatric infectious diseases team, especially the fellow and attendings, both in the clinic and inpatient service. They will have the opportunity to provide the initial assessment and management plans for patients referred to pediatric infectious diseases. Students that elect to take this two credit option are not eligible to enroll in PEDS 421C for the 3-4 credit option. For more information, please contact Dr. Robert Drucker (robert.drucker@duke.edu). Permission is required. Credit: 2. Enrollment Max: 2. *Robert Drucker, MD*

PEDS-421C. Pediatric Infectious Diseases - Comprehensive. This course provides three to four weeks of experience in the evaluation, diagnosis, management and follow-up of patients with possible infectious diseases. Students will work closely with the infectious disease team, especially the fellow and attendings, both in the clinic and inpatient service. They will have the opportunity to provide the initial assessment and management plans for patients referred to pediatric infectious diseases. Students that take this course are not eligible to enroll in PEDS 420C. For more information, please contact Dr. Drucker at Robert.drucker@duke.edu. Secondary contact: Dr. Steinbach, 684-6335. Administrative contact is Betsy Faust (betsy.faust@duke.edu), 684-6335. 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 pager: 970-7420. Permission is required. Credit: 3 to 4. Enrollment: max 2. *Robert Drucker, MD and division faculty*

PEDS-424C. Introduction to Pediatric Endocrinology and Diabetes. Students attend in the Pediatric Endocrine, Diabetes, Lipid, Transgender 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 growth and sexual development, thyroid function, and diabetes mellitus. Students also participate in a weekly endocrine division conference. Students will make a presentation to the endocrine group at the end of the rotation. Permission is Required. Enrollment Max: 2; Credit: 1-2. 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: 1-2, with 1 credit for every week of the course. Enrollment: max 2. *Robert Benjamin, MD; Michael Freemark, MD; Deanna Adkins, MD; Nancie J. MacIver, MD/PhD; Laura Page, MD; and Pinar Gumus, MD*

PEDS-425C. Endocrine Disorders in Children. Students participate in the Pediatric Endocrine, Diabetes, Lipid, Transgender and Insulin Resistance/Obesity Clinics and assume active roles in the evaluation and management of in-patient consultations and of in-patients admitted to the Endocrine Service. Emphasis is placed upon the evaluation of several endocrine issues, including diagnosis and management of Type 1 and Type 2 Diabetes Mellitus, growth and sexual development, transgender management, lipid disorders, thyroid disorders, pituitary disorders, and calcium and vitamin D disorders. Students also participate in a monthly diabetes 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: 3 to 4, with 1 credit for every week of the course. Enrollment: max 2. *Robert Benjamin, MD; Michael Freemark, MD; Deanna Adkins, MD; Nancie J. MacIver, MD/PhD; Laura Page, MD; and Pinar Gumus, 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 attention to 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. The exception is INTERDIS 401C - Acute Care Curriculum. 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; Kamlesh Athavale, MD; Eric Benner, MD/PhD; Margarita Bidegain, MD; C. Michael Cotten, MD; Jeffrey Ferranti, MD/MS; Rachel Greenberg, MD; Lawrence Ku, MD; Jennifer Peterson, MD; Brian Smith, MD; David Tanaka, MD; and Noelle Younge, 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 week 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 of their choice and deliver a short presentation at the end of their rotation. Location: Hanes House, room 382; Box number 102382. For more information please contact Dr. Kreissman via email at susan.kreissman@duke.edu. Prerequisite: contact instructor. Credit: 4. Enrollment: max 1. *Susan Kreissman, MD;; Ray Barfield, MD/PhD, Danial Landi MD; Corinne Linardic MD/PhD; Philip Rosoff, MD; Jennifer Rothman MD; Nirmish Shah MD, Kristin Schroeder MD; Jessica Sun MD; and David Van Mater, 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 interviewing, an evidence-based communication technique to achieve effective behavior change. Students will be expected to participate actively in weekly noon team learning seminar (Thursdays) 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. Maradiaga via email at gabriela.maradiaga@duke.edu. Credit: 4. Enrollment: max. 1. Secondary contact katherine.caro@duke.edu. Credit: 4. Enrollment: max. 1. *Gabriela Maradiaga Panayotti, MD; Sarah Armstrong, MD; Caren Mangarelli, MD; Martha Nelson, PA-C; Chandler Moeller, NP; Katherine Caro, PA-C; Jenny Favret, MS, RD, LDN; Dorothy Conrad, MPH, RD; Andrea Hartzell, PT, DPT, MHS; Heidi Pongracz, MPH, PT; Victoria Smith, PT, DPT, PCS; Lisa Honeycutt, LPC*

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. Zebulon Spector, at (919) 681-6772 or by email, zebulon.spector@duke.edu. Secondary Contact: Dr. Michael J. Campbell, (919) 684-3574 or michael.campbell2@duke.edu. Credit: 4. Enrollment: max 1. *Zebulon Spector, 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. An alternate contact is Debra Preddy. You may reach her via email at 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: students must contact Dr. Kansagra (sujay.kansagra@duke.edu) prior to enrollment. Credit: 4. Enrollment: max 2. *Sujay Kansagra, MD*

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 a project (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 pathophysiologic 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 Cheifetz, MD; Sameer Kamath, MD; David Turner, MD; Kevin Watt, MD; and Kanecia Zimmerman, MD, MPH*

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. Credit: 4. Enrollment: max 1. *Delbert Wigfall, MD; R. Gbadegesin, MD; and Shashi Nagaraj, MD/MBBS*

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; Suhag Parikh, MD; Vinod Prasad, MD; and Kristin Page, MD*

Psychiatry and Behavorial Sciences

Chair: Moira Rynn, MD
Chief of Staff: Nathan Swanson
Business Manager: Jennifer Ellis
Campus PO Box: 3950
Phone: (919) 684-5616
Fax: (919) 681-5489

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 consultation services in three 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: *Mary Kirkley (*mary.kirkley@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 consultation services in three 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: Mary Kirkley (mary.kirkley@duke.edu). Credit: 4. *Shelley Holmer, MD*

PSYCHTRY-209C. Longitudinal Integrated Curriculum – Psychiatry (LIC). LIC students will complete 3 weeks of inpatient psychiatry. 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 and the psychiatry emergency rooms. Student 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 the rotation site. Students are encouraged to observe psychotherapy and to participate in supervised psychological treatments wherever appropriate opportunities can be provided. LIC students

will participate in a 16-week Behavioral Health Seminar during the LIC portion of the year. This seminar is run by psychiatry faculty and includes case presentations by students of patients they are seeing in the LIC outpatient settings. Secondary Contact: Mary Kirkley (mary.kirkley@duke.edu). Credit: 4. *Shelley Holmer, MD*

Second Year, Two-Week Clinical Selectives

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. 1. Location: Duke University Hospital North, 5100 unit- 8:30 a.m. For more information, please contact Dr. Genalynne Mooneyham (genalynne.mooneyham@duke.edu) *Genalynne Mooneyham, 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*

Clinical Science Electives

PSYCHTRY-401C. Sub-Internship 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: Mary Kirkley, email at mary.kirkley@duke.edu, phone: 681-9632. Credit: 5. Enrollment: max 1. *Shelley Holmer, MD*

PSYCHTRY-407C. Sub-Internship 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 (support staff – cc: mary.kirkley@duke.edu) or 668-0207. Preference is given to students considering a career in combined Medicine-Psychiatry. Prerequisite: successful completion of PSYCHTRY-205C and MEDICINE-205C. C-L MEDICINE 407C. Permission is required. 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 mixture inpatients, outpatients, consults to learn basics of Psychotherapy, including short-term psychotherapy of in and outpatients, 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—Not currently offered.*

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: contact instructor for verbal or email 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 (support staff – cc: mary.kirkley@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

Chair: Christopher G. Willett, MD
Assistant: Donna Wimberley
Business Manager: Joy Sprink
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Fax: (919) 688-7345

Second Year, Two-Week Clinical Selective

RADONC-220C. Brief Experience 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*

Clinical Science Elective

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
Assistant: Maria Nelson
Business Manager: John Dion
Campus PO Box: 3808
Phone: (919) 684-7293
Fax: (919) 613-5716

Required Course

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*

Second Year, Two-Week Clinical Selective

RADIOL-222C. Vascular & Interventional Radiology. Vascular and Interventional Radiology (VIR) has established a residency program. The 2nd-year selective in VIR is designed to provide medical students an opportunity to learn more about the practice of Vascular and Interventional Radiology. The students will be involved in: (1) pre-procedural patient care: via focused inpatient and outpatient patient assessment, review of imaging, and informed consent process; (2) intra-procedural care: devices, terminology, and technique; (3) post-procedural patient care: focused patient assessment in the radiology recovery room, as well as in the inpatient setting, (4) procedural documentation/reporting, and (5) patient follow-up care planning. By the end of the rotation, the students will be knowledgeable about the most common procedures performed by VIR, and pre- and post- procedure patient care. NOTE: Students that take this two week selective may not take the fourth year course equivalent, RADIOL 404C. Enrollment Max: 2; Credit 2. *Waleska Pabon-Ramos, MD/MPH*

Clinical Science 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 needle localization prior to surgical biopsy, and steroetactic, 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. Kim via email at connie.kim@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). *Connie Kim, MD; Jay A. Baker, MD; Sora Yoon, MD; Sujata Ghate, MD; Lars Grimm, MD; Karen S. Johnson, MD; Mary Scott Soo, MD; Ruth Walsh, MD; and Sora Yoon, 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. Direct questions about the course to Dr. Leder, richard.leder@dm.duke.edu. *Richard Leder, MD and 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; James Ronald, MD/PhD; David Sopko, MD; Tony Smith, MD; and Paul Suhocki, 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 multispecialty 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. This "to do" list is to be completed and turned in for assessment. 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. Course begins promptly at 8:30 a.m. in Pediatric Radiology Division, 1st Floor Children's Health Center - 1905A. Credit: 4. Enrollment: max 1. *Caroline Carrico, MD; Joe Davis, MD; Donald Frush, MD; Charles Maxfiield, MD; and Gary Schooler, MD*

RADIOL-421C. Clerkship in Neuroradiology. A specialized program of detailed instruction in neuroradiology. 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. This is mainly an observational rotation. There is an optional honors presentation available for credit. Grade is based on reading room attendance and conference attendance. For more information please contact Dr. James Eastwood at (919)684-7466 or via email at eastw004@mc.duke.edu. Secondary 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 1, 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. There is a test at rotation's end. For more information please contact Dr. Charles Spritzer via email at charles.spritzer@duke.edu. Credit 4. Enrollment: max. 2. *Charles Spritzer, MD; Caroline Carrico, MD; Drs. R. Lee Cothran, Jr., MD; Nick Said, MD; Erin McCrum, 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 and 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: 4 Max: 2. *Truls Ostbye, M.B.A.*

Surgery

Chair: Allan Kirk, MD, PhD, FACS
Assistant: Kim Toole
Executive Director: Katherine Stanley
Campus PO Box: 3704
Phone: (919) 681-3445
Fax: (919) 681-2779

Required Courses

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. For questions, please contact Angela Cotton, Program Coordinator, via email, angela.cotton@duke.edu. 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 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. For questions, please contact Angela Cotton, Program Coordinator, via email, angela.cotton@duke.edu. Credit: 8. *John Haney, MD*

SURGERY-209C. Longitudinal Integrated Curriculum - Surgery. The required course in surgery is given during the second year and consists of a two-week inpatient clinical clerkship and a longitudinal outpatient component. The primary goal is to provide a rich experience in 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 at Duke Regional Hospital inpatient service. Students work 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. LIC students will participate when possible in the bi weekly seminars presented 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, orthopedics, otolaryngology, plastic surgery, and urology. Students are also given an opportunity to reinforce their knowledge of anatomy and physiology. For questions, please contact Angela Cotton, Program Coordinator, via email, angela.cotton@duke.edu. Credit: 8. *John Haney, MD*

Second Year, Two-Week Clinical Selectives

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. Secondary Contact: Cassy Albertson via email Cassandra.albertson@duke.edu. Credit: 2. Enrollment Max. 2, unless otherwise noted. Location and time: Duke North 6300 ward at 6:00am. *Scott Hollenbeck, MD; Cassandra Albertson, PA-C*

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. Cory Vatsaas via email, cory.vatsaas@duke.edu. Students may also email Jordan Toole at jordan.toole@duke.edu. *Cory Vatsaas, MD; 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: DMP, time to be arranged. Contact: Students should contact Dr. D'Amico at Phone (919) 681-0491 or via email at thomas.damico@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 shu.lin@duke.edu for more information and to find out the time and location for the first day of classes. *Shu Lin, MD/PhD*

SURGERY-227C. Urology. 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 Experience 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. Secondary contact: Rena Springer, (rena.springer@duke.edu or (919) 681-4458. *David Gordon, MD*

SURGERY-230C. Trauma and 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. For more information, please contact Dr. Cory Vatsaas at cory.

vatsaas@duke.edu. Credit: 2. Enrollment: max 2. *Cory Vatsaas, MD; 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 email obinna.adibe@dm.duke.edu. *Obinna Adibe, MD; Henry Rice, MD; and Elisabeth Tracy, MD*

SURGERY-232C. Introduction to Endocrine Surgery. The Endocrine Surgery Selective will allow second year medical students to be exposed to, and participate in, the preoperative, intraoperative, and postoperative care of endocrine surgery patients. This patient population encompasses a wide variety of benign, malignant, hormonally active, and hereditary endocrine diseases of the thyroid, parathyroid, adrenal, and neuro-endocrine pancreas/systems which are evaluated in a multidisciplinary clinic along with medical endocrinology, oncology, pathology, genetics, and radiology. A working knowledge of these diseases and their multidisciplinary management is critical to a career in internal medicine or surgery, in particular. Credit: 2. Enrollment: max 2, min 1. *Randall P. Scheri, MD; Sarah Ahmandi, MD; Jennifer Perkins, MD; Sanziana Roman, MD; Julie Ann Sosa, MD; Michael Stang, MD*

Required Second Year Elective (PCLT and LIC tracks)

SURGERY-242C. Emergency Medicine: Longitudinal Experience. This course provides an emergency medicine/acute care experience for students enrolled in the Primary Care Longitudinal Track (PCLT) or Longitudinal Integrated Clerkship (LIC). Students will work a total of 13 clinical shifts across different sites: Duke University Hospital (DUH) Emergency Department, Durham VA Emergency Department, and Duke Urgent Care. At least one of these shifts will be spent in the resuscitation area of DUH Emergency Department participating in the care of critically ill patients. Through this course students will develop their skills in evaluating undifferentiated patients, performing focused patient assessments, developing differential diagnoses, and recognizing high-acuity medical conditions. Enrollment will be in the spring term. The course will be graded P/F. Enrollment Max. 16; Credit: 4. For more information, please contact Dr. David Gordon (davidc.gordon@duke.edu. *David Gordon, MD*

Clinical Science 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 sub-specialty 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 Angela Cotton via email at angela.cotten@duke.edu. Credit: 5. Enrollment: min. 1, max 8. *Trey Blazer, MD. Available mentors: Andrew Barbas, MD; Mitchell Cox, MD; Thomas D'Amico, MD; Mani Daneshmand, MD; Jeffrey Gaca, MD; Donald Glower, MD; Rachel Greenup, MD; John Haney, MD; David Harpole, Jr., MD; Sandhya Lagoo, MD/PhD; Shelly Hwang, MD/MPH; Andrew Lodge, MD; Christopher Mantyh, MD; Richard McCann, MD; John Migaly, MD; Theodore Pappas, MD; Dana Portenier, MD; Kadiyala Ravindra, MD; Henry Rice, MD; Sanziana Roman, MD; Randall Scheri, MD; Jacob Schroder, MD; Mark Shapiro, MD; Cynthia Shortell, MD; Julie Sosa, MD/MA; Elisabeth Tracy, MD; Betty Tong, MD; Steven Vaslef, MD/PhD; and Sabino Zani, MD*

SURGERY-402C. Emergency Medicine Sub-Internship. 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 weekly medical student lectures, Thursday 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 681-2820 or via email, davidc.gordon@duke.edu. Secondary Contact: Rena Springer (rena.springer@duke.edu) or (919) 681-4458. 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. Credit: 5. max: variable. Offered in summer 43 only, summer 44 only, and all 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 Dr. Hollenbeck via email at scott.hollenbeck@dm.duke.edu or Cassy Albertson at cassandra.albertson@duke.edu. Enrollment Max: 3. Credits: 5. *Scott Hollenbeck, MD; Cassandra Albertson, PA-C*

SURGERY-405C. Introduction to Point of Care Ultrasound. The 4th year elective in Point of Care Ultrasound aims to educate medical students in the core applications of bedside ultrasound. The students will be introduced to both the skills of image acquisition and image interpretation. The course will consist of: (1) education about uses and indications for point of care ultrasound with didactics; (2) hands on teaching about the acquisition of images with both simulators and live emergency department patients; (3) time dedicated to learning image interpretation of bedside ultrasounds. By the end of rotation, the student will have an introductory understanding of the indications for,

skills to perform, and the clinical integration of bedside ultrasound into patient care. During spring 2017 the course will be offered during section 42 during two one-week periods. For more information, please contact Dr. Peethumnongsin via email, erica.peethumnongsin@duke.edu. Credit: 1. Enrollment: max:6; min:2. If the minimum number of students do not enroll in the course, that section or sections will be cancelled. Course is graded P/F. *Erica Peethumnongsin, MD*

SURGERY-406C. Endocrine Surgery. The Endocrine Surgery Elective will allow fourth year medical students to be exposed to and participate in the preoperative, intraoperative and postoperative care of endocrine surgery patients. This patient population encompasses a wide variety of benign, malignant, hormonally active, and hereditary endocrine diseases of the thyroid, parathyroid, adrenal and neuro-endocrine pancreas/systems which are evaluated in a multidisciplinary clinic along with medical endocrinology, oncology, pathology, genetics, and radiology. A working knowledge of these diseases and their multidisciplinary management is critical to a career in internal medicine or surgery. Permission of the instructor is required. For more information about the course and obtain permission to enroll students should contact Dr. Randall Scheri at r.scheri@duke.edu. Students should report to Dr. Scheri's office located at 463 Seeley Mudd Building on the first day of class. Credit: 4. Enrollment max: 2. *Randall P. Scheri, MD; Sanziana Roman, MD; Julie Ann Sosa, MD; Michael Stang, MD; Jennifer Perkins, MD; and Sarah Ahmadi, MD*

SURGERY-407C. Direct Observation and IPE Student Clinic Leadership Elective I. Senior students provide leadership to the direct observation and IPE student clinic. Students will help define goals for the clinic, barriers to achieving these goals, and solutions to these barriers. Main roles will include leading the team (responsibility for direct clinical operations, such as opening the clinic each night, clinic, teaching and providing feedback to other learners in clinic) and engaging in quality improvement that impacts the learners (i.e. developing formal teaching modules/videos/simulations) and that impacts patients (patient access to health care, patient flow, patient satisfaction, patient outcomes and or learner). This elective will give students a direct role in shaping a clinic for patient care. Students will gain insight into important aspects of systems-based practice: from laws governing care to patients with possible emergent/urgent medical conditions, to health care finance and reform, and healthcare reimbursement. Credit. 2; Enrollment Max: 2. *Alison Clay, MD and Erin Leiman, MD*

SURGERY-408C. Direct Observation and IPE Student Clinic Leadership Elective II. Senior students provide leadership to the direct observation and IPE student clinic. Students will help define goals for the clinic, barriers to achieving these goals, and solutions to these barriers. Main roles will include leading the team (responsibility for direct clinical operations, such as opening the clinic each night, clinic, teaching and providing feedback to other learners in clinic) and engaging in quality improvement that impacts the learners (i.e. developing formal teaching modules/videos/simulations) and that impacts patients (patient access to health care, patient flow, patient satisfaction, patient outcomes and or learner). This elective will give students a direct role in shaping a clinic for patient care. Students will gain insight into important aspects of systems-based practice: from laws governing care to patients with possible emergent/urgent medical conditions, to health care finance and reform, and healthcare reimbursement. Credit: 3-4; Enrollment max: 2. *Alison Clay, MD and Erin Leiman, MD*

SURGERY-409C. Surgical Technique and Review Course (STAR). This course will provide formal instruction to prepare 4th year medical students for their upcoming duties as interns in a surgical specialty. Students will be exposed to common diagnostic scenarios, pre- and post-operative patient care, extensive technical skill training, surgical anatomy, and floor management of patients. Students will also receive a preview into their upcoming responsibilities as a house officer. This course will facilitate transition of 4th year students into their new role as surgical residents. This course will be completely funded by the Department of Surgery. Enrollment Max: 20; Credit: 2. Students should meet on the first day of classes in TSCHE Classroom 5. In the event that this space is unavailable we can also host this course in any classroom in TSCHE or one of the lab spaces. *John Migaly, MD and Elisabeth Tracy, 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 Thursday 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) 681-2820 or by email, davidc.gordon@duke.edu. Secondary Contact: Rena Springer (rena.springer@duke.edu) or (919) 681-4458. Prerequisites: none. First day meeting: 9:00 a.m. in the conference room located in the emergency services administrative suite above the emergency department. 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. Students will typically spend 1-2 weeks on 2-3 different services. Students will rotate on services with a focus on Hepatobiliary, Pancreas, Breast, Endocrine, Colorectal, Soft Tissue Sarcoma, and Melanoma Disease sites. 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. For more information please contact Dr. Trey Blazer via email, trey.blazer@duke.edu or by phone at 684-6553. Permission is required. Credit: 4. Enrollment: min 1, max 2. *Trey Blazer, 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 681-0491. Credit: 4. Enrollment: min 1, max 5. *Thomas D'Amico, MD; Jeffrey G. Gaca, MD; Donald Glower, MD; John C. Haney MD, David Harpole, MD; Matthew G. Hartwig, MD; Chad Hughes, MD; Joseph Klapper, MD; Andrew Lodge, MD; Carmelo Milano, MD; Ryan Plichta, 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. At the end of the clerkship, the student is required to give a formal presentation of a pediatric surgical topic of his or her choice. The student may tailor the clerkship month to include various aspects of pediatric surgery (neonatology, cardiac surgery, etc.) 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. Permission is required. Credit: 4. Enrollment: max 1. *Tamara Fitzgerald, MD/PhD; Henry Rice, MD; Obinna Adibe, MD; Elisabeth Tracy, MD*

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; David Jang, MD; David Kaylie, MD; Debara Tucci, MD; David Becker, MD, Walter Lee, MD, Eileen Raynor, MD, Dan Rocke, MD; Charles Woodard, MD; and David Witsell, MD/MHS*

SURGERY-441C. Sub-Internship 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 online 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 Multidisciplinary 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. Cory Vatsaas at 684-3636 or via email, cory.vatsaas@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. *Cory Vatsaas, MD; Steven Vaslef, MD/PhD; 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. Cory Vatsaas at 684-3636 or via email at cory.vatsaas@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. *Cory Vatsaas, MD; 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 Cassy Albertson via email cassandra.albertson@duke.edu. Credit: 4. Enrollment: max 2. *Scott Hollenbeck, MD; Cassandra Albertson, PA-C.*

SURGERY-448C. Sub-Internship 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; David Jang, MD; David Kaylie, MD; Walter Lee, MD; Eileen Raynor, MD; Dan Rocke, MD; Debara Tucci, MD; David Witsell, MD/MHS; and Charles Woodard, MD*

SURGERY-451C. Sub-Internship 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. Please contact Dr. Rampersaud at edward.rampersaud@duke.edu for more information and to obtain your permission number. Prerequisite: Permission is required. Credit: 5. Enrollment max: 3. *Edward Rampersaud, MD; and urology staff*

Basic Science Departments

Biochemistry

Chair: Richard Brennan, PhD
Assistant: Peggy Wilkinson
Business Manager: Esther Self
Campus PO Box: 3711
Phone: (919) 681-8804
Fax: (919) 684-8885
http://www.biochem.duke.edu/

Biostatistics and Bioinformatics

Chair: Elizabeth Delong, PhD
Assistant: Debbie Medlin
Business Manager: Dawn Hails
Campus PO Box: 2721
Phone: (919) 668-8828
Fax: (919) 668-7061
https://biostat.duke.edu/

Cell Biology

Chair: Brigid Hogan, PhD
George Barth Geller Professor of Research in Molecular Biology
Assistant: Kelly Long
Business Manager: Mollie Sykes
Campus PO Box: 3709
Phone: (919) 684-8085
Fax: (919) 684-8592
http://www.cellbio.duke.edu/

Immunology

Chair: Michael S. Krangel, PhD
Assistant: Jennifer Goins
Business Manager: Todd Leovic
Campus Box: 3010
Phone: (919) 684-3578
Fax: (919) 684-8982
https://immunology.duke.edu/

Molecular Genetics & Microbiology

Chair: Joseph Heitman, MD, PhD
Assistant: Melissa Palmer
Business Manager: Susan Powell
Campus Box: 3546
Phone: (919) 684-2814
Fax: (919) 684-5458
https://mgm.duke.edu/

Neurobiology

Chair: Stephen G. Lisberger, PhD
Business Manager: Melissa Segal
Campus Box: 3209
Email: neurobio@duke.edu
https://www.neuro.duke.edu/

Pharmacology and Cancer Biology

Chair: Donald P. McDonnell, PhD
Assistant: Trena Martelon
Business Manager: Sharon Dowell-Newton
Campus PO Box: 3813
Phone: (919) 684-6035
http://pharmacology.mc.duke.edu/

Population Health Sciences

Chair: Lesley Curtis, PhD
Assistant: Tracy Madrid
Business Manager: Teri-Lynne Sennett
Campus PO Box: 104023
Phone: (919) 681-6709
https://populationhealth.duke.edu/

Thesis

Basic Science Elective

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 (including outcome research). At the beginning of the year each student will define an area of independent study and a hypothesis. 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, Medicine, Orthopedics, Pediatrics, and Surgery 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: Alexander Allori, MD; Benjamin Alman, MD; Eric Benner, MD; Andrew Berchuck, MD; Miles Berger, MD; Todd V. Brennan, MD, MS; Joshua Broder, MD; Qing Cheng, MD; Seth Morris Cohen, MD; Gayathri Devi, MD; Anna Mae Diehl, MD; Dennis Frank-Ito, PhD, John (Jake) Freiberger, MD, MPH; William Garrett, MD; Grant Edward Garrigues, MD; Oren Gottfried, MD; Ashraf Samir Habib, MBB; George Charles (Chad) Hughes, MD; Shelley Hwang, MD; Brant Inman, MD, MSc; Robert Eric Isaacs, MD; Michael (Luke) James, MD; Ru-Rong Ji, MD; Sven Eric Jordt, MD; Allan Douglas Kirk, MD; Stuart Johnston Knechtle, MD; Madan M. Kwatra, PhD; Sandhya A. Lagoo-Deenadayalan, PhD, MS; Robert Lark, MD; Jeffrey H. Lawson, MD, PhD; Howard Levinson, MD; Alexander Limkakeng, MD; Michael Eric Lipkin, MD; Jeffrey Robert Marcus, MD; Timothy McMahon, MD, PhD; Carmelo Alessio Milano, MD; Richard Moon, MD; Claude Moorman, MD; Paul Mosca, MD; Judd Moul, MD; Andrea Gail Nackley, MD; David Needham, MD; Andrew Peterson, MD; Claude A. Piantadosi, MD; Thomas Polascik, MD; Glenn M. Preminger, MD; Jonathan Charles Routh, MD; Charles Douglas Scales, MD; Timothy Sell, PhD, Mark Stafford-Smith, MD; Ranjan Sudan; Jeffrey M. Taekman, MD; Elisabeth Tomlinson Tracy, MD; Debara Lyn Tucci, Tom Van de Ven, MD, MD; David S. Warner, MD; Ian James Welsby, MD; David Latham Witsell, MD

Behavioral Neurosciences Study Program

BSP-301B. RESEARCH IN BSP. Program Director: Chris Marx, MD, MA. The Behavioral Neurosciences study track provides opportunities for research aimed at understanding: 1) the basic processes underlying normal behavior; and 2) the pathophysiology and treatment of pathological human and laboratory animal behavior. Students will be assisted by the Study Program Director in selecting an area of research concentration, a faculty member who will serve as their research preceptor, and an appropriate project that can be completed in the time available. At the end of the year, each student is expected to have completed a project of sufficient merit to warrant presentation and publication. Research experiences can be augmented with coursework where appropriate. FACULTY: James A. Blumenthal, PhD; P. Murali Doraiswamy, MBB; Kafui Dzirasa, MD, PhD; Cynthia Moreton Kuhn, PhD; Madan Kwatra, PhD; Edward D. Levin, PhD; David J. Madden, PhD; Christine Marx, MD; Rajendra Morey, MD, MS; Jeffrey R. Petrella, MD; Jed Eugene Rose, PhD; Rochelle Schwartz-Bloom, PhD; Andrew Sherwood, PhD; Linmarie Sikich, MD; Richard D. Weiner, MD, PhD; William C. Wetsel, PhD; Keith Whitfield, PhD; Redford Williams, MD

Biomedical Engineering and Surgery Study Program

BES-301B. RESEARCH IN BES. Program Director: Bruce Klitzman, 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 surgical sciences, regenerative medicine, biomedical engineering and tissue engineering. 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 the employment either of whole animal or patient models or in vitro simulation of disease states. The development and employment of new instrumentation also may be a strong component of the research effort, as long as the research is rigorously quantitative. Emphasis in the student experience is placed upon the teaching of the quantitative or computational methods 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 offer conclusions from their data. Each student selects a faculty mentor 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 an engineering background. For those who may be interested in innovation and entrepreneurship, BES has been designed to incorporate such opportunities with a quantitative focus, such as prototype testing, which has resulted in the establishment of new Dual Degree, MD/MEng closely affiliated with the Biomedical Engineering and Surgery Program. The 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: Alexander Allori, MD; Ben Alman, MD; Cameron (Dale) Bass, PhD; Michael Bolognesi, MD; Nenad Bursac, PhD; Linda Cendales, MD; Jun Chen, PhD; Qing Cheng, MD; Seth Morris Cohen, MD; Lewis DeFrate, DSc; Gayathri Devi, PhD; Mark Dewhirst, DVM; Mark Easley, MD; Detlev Erdmann, MD, PhD, MHSc; Sina Farsiu, PhD; William Garrett, MD; Grant Garrigues, MD; Warren Grill, PhD; Craig Henriquez, PhD; Matthew Hilton, MD; Scott Hollenbeck, MD; Allan Kirk, MD, PhD; Bruce Klitzman, PhD; Stuart Knechtle, MD; Jeffrey H. Lawson, MD, PhD; Howard Levinson, MD; Wolfgang Liedtke, MD, PhD; Jeffrey Marcus, MD; Amy McNulty, PhD; Barry Myers, MD, PhD; Miguel Nicolelis, PhD; James A. Nunley, MD; Steven Olson, MD; Nimmi Ramanujam, PhD; Amanda Randles, PhD; Jonathan Riboh, MD; Jonathan Routh, MD; Charles Douglas Scales, MD; Timothy Sell, PhD; Thorsten Seyler, MD; Andrea Beth Taylor, PhD; George Truskey, PhD; Tuan Vo- Dinh, PhD; Jennifer West, PhD; David Witsell, MD

Radiology, Radiation Oncology, and Medical Physics

RROMP-301B. RESEARCH IN RROMP. Program Director: Joseph Lo, PhD. 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 ; 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: machine learning and predictive modeling, radiomics / radiogenomics ; intra-operative imaging, functional MRI to understand psychological behavior.
- Basic laboratory science: epigenetics of radiotherapy, mechanisms of radiation injury, lung cancer proteomics, MR microscopy, diffusion tensor imaging.

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: Jay Baker, MD; Rachel Blitzblau, MD; Joshua Broder, MD; Junzo Chino, MD; Bastiaan Driehuys, PhD; Will Eward, MD; Sina Farsiu, PhD; Scott Floyd, PhD; Donald Frush, MD; Rajan Gupta, MD; Scott Huettel, PhD; Charles Kim, MD; David Kirsch, MD, PhD; Bridget Koontz, MD; Joseph Lo, PhD; Maciej Mazurowski, PhD; Rendon C. Nelson, MD; Edward Patz MD; Jeffrey Petrella, MD; James Provenzale, MD; Joseph Salama, MD; Ehsan Samei, PhD; Martin Tornai, PhD; Timothy Turkington, PhD

Clinical Research Study Program

CRSP-301B. RESEARCH IN CLINICAL RESEARCH. Clinical Research Study Program Director Vivian Chu, MD, MHS. This study program offers students the opportunity to explore the quantitative and methodological principles of clinical research. Students will learn about the clinical research process by engaging in a hands-on experience in one or more of the following areas: clinical trials, outcomes, databases and registries, surveys, and translational projects. Structured research education is enhanced by career development, research conferences featuring a variety of specialties, integration with DCRI fellowship program, and mentorship from faculty and fellows. Leadership in research investigations is encouraged by requiring a minimum of 1 primary analysis suitable as a thesis or submission to peer-reviewed journal and participation as a team member or primary investigator on other projects.FACULTY: Amy Abernethy, MD; Sana Al-Khatib, MD; John Hunter Peel Alexander, MD; Rand Allingham, MD; Benjamin Alman, MD; Andrew Arai, MD; John Bartlett, MD; Daniel K. Benjamin, MD, PhD, MPH; Andrew Berchuck, MD; Kimberly Lynn Blackwell, MD; Gerard Conrad Blobe, MD; Michael Bolognesi, MD; Hayden Bosworth, PhD; J. Matthew Brennan, MD; Barbara Jean Burns, MD; Blanche Capel, PhD; Marc G. Caron, PhD; June Chan, DSc; Junzo Chino, MD; Alex Han Cho, MD; Dennis Clements, MD; Jeffrey David Clough, MD; Megan Clowse, MD; Harvey Cohen, MD; Michael Cohen-Wolkowiez, MD; Leonor Corsino, MD, FACE, MHS; Christopher Counter, PhD; Leslie Curtis, PhD; James Daubert, MD; Geraldine Dawson, MD; Lou DeFrate, PhD; David Edelman, MD; William Eward, MD; Deborah Fisher, MD; Vance Fowler, MD, MHS; Dennis Frank-Ito, PhD; Neil J. Freedman, MD; Henry Friedman, MD; Karen Frush, MD; Anthony Galanos, MD; Geoffrey Steven Ginsburg, MD, PhD; Oren Gottfried, MD; Christopher Bull Granger, MD; Gregory Gray, MD; Farshid Guilak, PhD; Michael Gunn, MD; Alex Haynes, MD, MPH-DF/HCC; Barton Ford Haynes, MD; Mitchell Todd Heflin, MD; Adreian Felipe Hernandez, MD; Helen Marie Hoeing, MD; Christoph Hornik, MD; Cathrine Hoyo, PhD, MPH; Erich Huang, MD, PhD; Kim Marie Huffman, MD; Jennifer Leigh Ingram, MD; Robert Isaacs, MD; Glenn J. Jaffe, MD; Wei Jiang, MD; G. Allan Johnson, MD; William Schuyler Jones, MD; Chad Kessler, MD; Raymond J. Kim, MD, MS; Warren Kinghorn, MD, DVM; Bruce M. Klitzman, PhD; Christopher D. Kontos, MD; Bridget Koontz, MD; Monica Kraft, MD; William Kraus, MD; Mitchell Wolfe Krucoff, MD; Maragatha Kuchibhatla, MD; Madan Mohan Kwatra, PhD; Nandan Lad, MD, PhD; Sandhya A. Lagoo-Deenadayalan, PhD, MS; Thomas William Leblanc, MD; Walter T. Lee, MD; Robert J. Lefkowitz, MD; Ann Lefurgey, BS, MS, PhD; Howard Levinson, MD; Jennifer Shiunroh Li, MD; Jane Liebschutz, MD, MPH; Alexander Limkakeng, MD; Shari Lipner, MD, PhD; Njira Lugogo, MD; Daniel Benjamin Mark, MD; Richard C. Mather, MD; David B. Matchar, MD; Douglas Charles McCrory, MD; James McNamara, MD; Mohamed Mikati, MD; Carmelo Alessio Milano, MD; Richard Moon, MD; Patricia Gripka Moorman, PhD, MSPH; Miriam Morey, MD; Judd Moul, MD; Amy Patricia Murtha, MD; Andrew Joseph Muir, MD; Amy P. Murtha, MD; Ann Marie Navar, MD; Rendon Nelson, MD; Laura Kristen Newby, MD; Maren Karine Olsen, PhD; Elise Olsen, MD; Marcus Ong MBBS, FRCS, MPH; Truls Ostbye, MD, MHS; Chet Patel, MD;

Manesh Patel, MD; Edward Patz, MD; Sallie Permar, MD, PhD; Eric Peterson, MD; Jeffrey Petrella, MD; Claude Anthony Piantadosi, MD; Johnathan Piccini, MD, MHSc; Carl Pieper, PhD; Mihai V. Podgoreanu, MD; Jennifer Gloeckner Powers, MD; Dawn Tranchino Provenzale, MD; James Provenzale, MD; William James Richardson, MD; David Alan Rizzieri, MD; Howard Rockman, MD; Jonathan Charles Routh, MD; John Sampson, MD, PhD; Devdutta Sangvai, MD; Charles Douglas Scales, MD; Kenneth Edwin Schmader, MD; Thorsten Seyler, MD, PhD; Kevin Shah, MD; Nazema Yusuf Siddiqui, MD; Mina Silberberg, PhD; Edward Clinton Smith, MD; P. Brian Smith, MD; Matthew Sparks, MD; Deborah Stein, MD; Karen Steinhauser, MD; Albert Y. Sun, MD; Mary Sunday, MD, PhD, BS; Laura Svetkey, MD; Geeta Swamy, MD; Marvin Stanley Swartz, PhD; Marilyn Jo Telen, MD; Kevin Thomas, MD; Cynthia Toth, MD; Debara Tucci, MD; Peter Ubel, MD; Antonius Vandongen, PhD; Deepak Voora, MD; Robert Wachter, MD; David Walmer, MD, PhD; Emmanuel B. Walter, MD, MHS; Tracy Yu-Ping Wang, MD, MHS, MS; Xiao-Fan Wang, PhD; David Witsell, MD; Heather Whitson, MD; John Wiley Williams, MD; Myles Wolf, MD; Syed Yousuf Zafar, MD; 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 focused research experience in cardiovascular science. The Study Program is structured for students who are interested in cardiovascular research that is translational or basic in nature, either at Duke or as a study-away experience. Sarnoff Fellowship students most often pursue their study-away research within this Cardiovascular Study Program. Duke Faculty members in this Study Program come from numerous departments, including Medicine, Biochemistry, Cell Biology, Immunology, Pathology, and Pharmacology and Cancer Biology. Students in the CVS Study Program undertake laboratory research projects under the guidance of a faculty mentor. In some cases, with the permission of their mentor and Study Program Director, students may take course work each term to complement their research interests. FACULTY: Marc G. Caron, PhD; Thomas M. Coffman, MD; Stephen D. Crowley, MD; Neil Freedman, MD; Michael D. Gunn, MD; Matthew Hartwig, MD; Barton F. Haynes, MD; Christopher L. Holley, MD, PhD; Mary Hutson, MD; William Schuyler Jones, MD; Raymond Kim, MD; Bruce Klitzman, MD; Christopher D. Kontos, MD; William E. Kraus, MD; Madan M. Kwatra, PhD; Robert J. Lefkowitz, MD; Francis Miller, MD; Robert McGarrah, MD; Carmelo A. Milano, MD; Andrew Muir, MD; Christopher B. Newgard, MD; Steven A. Olson, MD; Eric D. Peterson, MD; Claude A. Piantadosi, MD; Jonathan P. Piccini, MD; Mihai Podgoreanu, MD; Kenneth D. Poss, PhD; Sudarshan Rajagopal, MD, PhD; Howard A. Rockman, MD; Sudha K. Shenoy, PhD; Matthew A. Sparks, MD; Jonathan A. Stiber, MD; Albert Y. Sun, MD; Marilyn Telen, MD; Antonius VanDongen, PhD; Deepak Voora, MD; Xiao-Fan Wang, PhD

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. Students interested in this track should consult with Dr. Kathryn Andolsek as early as possible, ideally in their first year or very early in their second year.

This study track combines formal coursework in epidemiology and population health, allowing students an opportunity to participate in the quantitative 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.

Students should select an appropriate 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 Gillings School of Global and Public Health Chapel Hill) or an alternate accredited school of public health. These two pathways DIFFER. Please see below for the two pathways.

1. University of North Carolina Gillings School of Global and Public Health Master of Public Health: For students seeking a Master of Public Health at the University of North Carolina Gillings School of Global and Public Health (Chapel Hill):
    a. Five tracks at the UNC Gillings School of Global and Public Health have been "pre-approved" by the Third Year committee. These include Epidemiology; Health Care and Prevention; Health Policy; Maternal and Child Health and Nutrition. Students do not need to present a Study Away proposal to the Third Year Committee if they intend to pursue one of these 5 tracks. Each student will have the equivalence of 10-12 months' participation in research. UNC Gillings Schools of Global and Public Health as other MPH programs—these may be able to be approved too by bringing request to the third year committee. See Dr. Andolsek if you are interested. Note: It is likely that by 2019 the curriculum of these programs and entry into them will be revamped. Please look at UNC Gillings School of Global and Public Health web site carefully to make certain you have the most up to date information.
    b. Students should identify a Duke approved mentor and research topics by January-March of the year in which they begin their third year. Most students have been able to use that project for some of the UNC's requirements, should they desires. Ideally, Duke IRB approval is obtained at the same time recognizing that IRB approval is usually necessary through both Duke and the other pertinent institutions. Coursework continuously informs their research project. If their desired Duke mentor is not already approved, students should describe their project and send the potential mentor's NIH biosketch to Dr. Andolsek to present to the Third Year Committee for approval as soon as possible. Mentor expectations can be found at the Third Year web site https://medschool.duke.edu/education/degree-programs-and-admissions/third-year-program/third-year-mentors but usually can include a faculty member at the associate professor rank (or higher), track record of successful mentoring, and research funding (sufficient that they will have protected time to mentor).
    c. The amount of MPH 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 that have an interest.
    d. 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.

e. UNC makes the determination of whether a student is considered "instate" for tuition purposes. For details, see http://sph.unc.edu/mch/mch-student-information/residency. This determination can be made on a semester by semester basis. A student who is turned down, may wish to appeal. If turned down for first semester can apply for subsequent semester(s).

2. A Master of Public Health NOT at the University of North Carolina Gillings School of Global and Public Health:
   a. Students who wish to apply to an alternate school of public health need to present their proposal to the Duke Third Year Committee as a Study Away Proposal, consistent with the Study Away Timelines. The Third Year Committee, in general, supports two-year master's programs, so that the students have an adequate research experience in addition to required coursework. If the course of study is a single year, then the Third Year Committee generally looks more favorably on student requests that include a "second" third year of research. (An exception has historically been made for the one/five approved tracks at UNC which is one-year duration).
   b. Students generally select a research project and a mentor at the MPH granting Institution. Supporting materials must be presented to the Duke Third Year Committee as a Study Away Proposal, consistent with Study Away Proposal Timelines. Alternatively, students may identify an approved Duke mentor they will work with "remotely;" and supporting information will be made part of the Duke Study Away proposal.
   c. Each student will have the equivalent of 10-12 months' participation in research. Students should identify a mentor, a 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
   d. area of epidemiology, health service research, 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 program within the public health school, and satisfy their requirements and the Third Year Requirements before progression to year 4 of Duke's curriculum.

PCLT students have additional expectations regarding the community engagement of their projects and should consult Dr. Anh Tran.

Students should consider carefully:

a. The timing of their plans to "re-enter" 4th year, especially with regard to clinical rotations and sub-internships.
b. Their projected study plan for USMLE Step 1.

Students may INSTEAD choose to spend a research year within the field of public health (but without pursuing a second MPH degree) through other Third Year options: The Clinical Research Study Program, headed by Dr. Vivian Chu, in Global Health with Dr. Dennis Clements, or in an area of qualitative research through the Medical Humanities Study Program, 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, headed by Dr. Jennifer Perkins.

Faculty from a number of study programs provide mentorship 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 addition 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; Susan Armstrong, MD; John Bartlett, MD, Daniel Benjamin, MD; Michael Bolognesi, MD; L. Ebony Boulware, MD, MPH; 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; Karen Frush, MD; Anthony Galanos, MD; Margaret Humphreys, MD, PhD; Alex R. Kemper, MD, MPH, MS; Chad Kessler, MD; Elizabeth Livingston, MD; David B. Matchar, MD; James Lloyd Michener, MD; John Murray, MD; Aditee Narayan, MD; Christopher Newgard, MD; Steven Olson, MD; Truls Ostbye, MD, MPH; Edward Patz, MD; Kathryn Ilonka Pollak, PhD; Jullia Ann Rosdahl, MD; John Sampson, MD, PhD; Mina R. Silberberg, PhD; Anthony So, MD; Laura Svetkey, MD; Geeta K. Swamy, MD; Nathan Thielman, MD, MPH; Peter Ubel, MD; David K. Walmer, MD, PhD; Emmanuel Walter, MD, MPH; David Witsell, MD, MHS; Christopher Woods, MD MPH; Anthony Viera, MD MPH

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 Ghana, Honduras, Sri Lanka, Thailand, and others. The Institute focuses on seven research priorities 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 (if the project is not a sponsored Duke Project), 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 collaborate to provide predeparture orientation and academic support while students are abroad. Please contact the GH Third Year Study Program Coordinator, Lysa MacKeen, or visit https://globalhealth.duke.edu/education-and-training/medical/third-year-global-health-study-program to learn more. FACULTY: John Bartlett, MD; Jerry Bloomfield, MD; Dennis Clements, MD, PhD, MPH; Coleen Cunningham, MD; Dorothy Dow, MD; Susan Emmett, MD, MPH; Tamara Fitzgerald, MD, PhD; Lauren Franz, MD; Gregory Gray, MD; Michael Haglund, MD; Megan Huchko, MD, MPH; Peter Kussin, MD; Sandhya Anand Lagoo-Deenadayalan, PhD, MS; Michael H. Merson, MD; Wendy O'Meara, MD; Truls Ostbye, MD, MPH; Henry Rice, MD; Matt Rubach, MD; Kristin Schroeder, MD, MPH;

Catherine Staton, MD; Svati Hasmukh Shah, MD, MHS; Mina Ruth Silberberg, PhD; Steve Taylor, MD; Nathan M. Thielman, MD, 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: Rasheed Gbadegesin, MBBS, MD. 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, kidney diseases, 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 can select therapy that is dictated by the individual genetic makeup, environment, and lifestyle. The study program in human genetics offers third year medical students an integrated program for understanding research in human genetics and genomics, its application to human genetic diseases for risk assessment, genetic counseling, public health practice, and potential therapeutics. The track also focuses on ethical and legal implications of genomic research. 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 such as use of next generation sequencing and other genetic tools to identify genetics causes of Mendelian diseasesbiochemical genetics, animal models of genetic disorders and development, epigenetics,gene therapy, genetic epidemiology and integrated omics platforms. Opportunities for both basic science and clinical/epidemiologic research projects are available in various laboratories participating in the HGP, and these opportunities span 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 and genomic research. Other elective courses may be taken with the permission of the program director and the student's preceptor. FACULTY: Allison Ashley-Koch, PhD. Professor in Medicine, Professor of Biostatistics and Bioinformatics; Blanche Capel, PhD. James B. Duke Professor of Cell Biology; Jen-Tsan Ashley Chi, MD, PhD. Associate Professor, Center for Genomic and Computational Biology; Gregory Crawford, PhD. Associate Professor in Pediatrics, Division of Medical Genetics; Sandeep Dave, MD Professor of Medicine, Member of the Duke Cancer Institute; Katherine Garman, MD Assistant Professor of Medicine, Member of the Duke Cancer Institute, Affiliate of the Regeneration Next Initiative; Rasheed Gbadegesin, MBBS, MD Associate Professor of Pediatrics, Associate Professor in Medicine, Member Duke Molecular Physiology Institute (DMPI); Elizabeth R. Hauser, PhD Professor, Department of Biostatistics and Bioinformatics, Director Computational Biology DMPI; Michael A. Hauser, PhD Professor, Department of Medicine, Member DMPI; Matthew Hilton, MD Associate Professor in Orthopedic Surgery, Associate Professor in Cell Biology; Yong-Hui Jiang, MD, PhD Associate Professor of Pediatrics, Associate Professor of Neurobiology; Priya S. Kishnani, MBBS Professor of Pediatrics, Division of Medical Genetics; Dwight Koeberl, MD PhD Professor of Pediatrics, Professor in Molecular Genetics and Microbiology; Virginia B. Kraus, MD, PhD Professor of Medicine, Professor of Pathology, Professor in orthopedic Surgery, Member DMPI, Affiliate of the Regeneration Next Initiative; Douglas Marchuk, PhD Professor of Molecular Genetics and Microbiology; Thomas Petes, PhD Professor of Molecular Genetics and Microbiology; Svati Shah, MD, MHS Associate Professor of Medicine, Member in the Duke Clinical Research Institute, Member DMPI; Bruce Sullenger, PhD Professor of Surgery, Associate Professor in Molecular Genetics and Microbiology, Professor of Pharmacology and Cancer Biology; Beth Ann Sullivan, MD Associate Professor of Molecular Genetics and Microbiology; Deepak Voora, MD Associate Professor of Medicine, Member of the Center for Applied Genomics & Precision Medicine; Qingyi Wei, MD, PhD Professor in Population Health Sciences

Master of Science of Library Science Study Program

MSLS-301B. MASTER OF LIBRARY SCIENCE STUDY PROGRAM. Director: TBD. 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: TBD. 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 Lylerly, 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. Director: Kevin Schulman, MD. The Master of Management in Clinical Informatics (MMCi) is offered by the Duke School of Medicine. The program is designed to train health professionals to thoughtfully apply technology in order to improve the experience and value of health care. It is clear that information technology has the capacity to transform clinical care, it's equally clear that it has not yet accomplished this vision. This program builds the core skills to lead this transformation, exposing students to core concepts in business as well as informatics to allow them to function as leaders in this emerging field, working in a health system, a start-up, a consulting firm, or a major technology firm. The curriculum has expanded to also address data visualization and data science. MMCi's unique Friday/Saturday class schedule is ideal for a third year medical student, where a third year research project can be applied to the required practicum project within MMCi.

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 2 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; Farr Curlin, MD; Nita Farahany, PhD; Margaret Humphreys, MD, PhD; Warren Kinghorn, MD, DVM; Thomas Leblanc, MD; Philip Rosoff, MD; Gopal Screenivasan, PhD; Peter Ubel, MD; Monica Lemmon, MD

Microbiology, Infectious Disease and Immunology Study Program

MIDIP-301B. RESEARCH IN MIRCROBIOLOGY AND INFECTIOUS DISEASE STUDY PROGRAM. Program Director: James Andrew Alspaugh, MD. The Microbiology, Infectious Diseases, and Immunology Program (MIDIP) provides students with the opportunity to explore various aspects of infectious diseases and immunology in both laboratory and clinical settings. Duke University has many world leaders in microbiology and immunology, many of whom have a tradition of outstanding mentorship for third year medical students. For example, investigators in the Human Vaccine Institute are developing new strategies to prevent transmissible diseases such as HIV infection, seasonal influenza, Zika virus infection, and maternal-fetal transmission of CMV. Other investigators in the Duke Global Health Institutes are studying how to prevent diseases prevalent in resource-limited settings, including typhoid fever and malaria.

Clinician-scientists in Pediatric Allergy and Immunology provide novel therapies for children with primary immune deficiency syndromes. Other investigators are exploring new ways to modulate the immune system for the treatment of autoimmune diseases and in the setting of solid organ and bone marrow transplantation. Immune-based therapies are also transforming the treatment of many cancers. All of these provide Duke medical students with a broad array of research opportunities in the field of immunology.

Faculty mentors at Duke also have outstanding research programs studying the molecular pathogenesis of bacterial, fungal, and viral infections. Many of these studies bridge the spectrum from basic, laboratory-based investigations to highly translational aspects of antibiotic development. The development of novel chemotherapies for microbial infections, particularly of prevalent or emerging infections, remains a high priority for public health.

The MIDIP emphasizes original research. 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. During the course of this scholarly experience, the student will learn 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.

FACULTY: James Abbruzzese, MD; J. Andrew Alspaugh, MD; Deverick Anderson, MD, MPH; John A. Bartlett, MD; Daniel K. Benjamin, MD, PhD, MPH; Maria Elena Cardenas- Corona, PhD; Adela Rambi Guanco Cardones, MD, MD; Jen-Tsan Ashley Chi, MD, PhD; Margaret Clowse, MD; Genevieve Giny Fouda, PhD; Vance Fowler, MD, MHS; Michael M. Frank, MD; Richard Frothingham, MD; Michal Dee Gunn, MD; Russell P. Hall, MD; Barton Ford Haynes, MD; Joseph Heitman, MD, PhD; Maureane Richardson Hoffman, MD, PhD; Kim Marie Huffman, MD, PhD; Sue Jinks-Robertson, PhD; Jack D. Keene, PhD; Garnett H. Kelsoe, PhD, MS; Dennis Ko, MD, PhD; Michael Krangel, MD; Joanne Kurtzberg, MD; Micah Luftig, PhD; Mary Louise Markert, PhD, MD; Micah McClain, MD, PhD; Amanda MacLeod, MD; David Charles Montefiori, PhD; M. Anthony Moody, MD; Michael Aaron Morse, MD; Evan Myers, MD; John R. Perfect, MD; William Parker, MD; John Perfect, MD; Thomas Petes, PhD; David J. Pickup, PhD; David S. Pisetsky, MD, PhD; Megan Reller, MD, PhD, MPH; David Ruch, MD; April Kelly Scott Salama, MD; Sudha Shenoy, MD; Herman F. Staats, PhD; William J. Steinbach, MD; Geeta Swamy, MD; Gregory Taylor, PhD.; Steve Taylor, MD; Thomas Tedder, MD; Marilyn Jo Telen, MD; Nathan M. Thielman, MD, MPH; David Tobin, PhD; Georgia Tomaras, PhD; Joe Brice Weinberg, MD; Christopher Woods, MD, MPH; Aimee Zaas, MD; Xiaoping Zhong, MD, PhD

Molecular Medicine

Program Director: David Hsu, MD

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 five (5) discreet sub tracks to accommodate the diversity of interest in Molecular Medicine: 1) Oncological Science Track, 2) Regenerative Medicine Track, 3) Molecular Basis of Disease Study Track, 4) Nutritional and Metabolic Mechanisms of Chronic Disease Study Track, and 5) Translational Pharmacology. FACULTY: Andrew Alspaugh, MD; Cameron (Dale) Bass, MD; Oren Becher, MD; Andrew Berchuck, MD; Perry Blackshear, MD; Michael Cohen-Wolkowiez, MD; Christopher Count, MD; David D'Alessio, MD; Michael Dewhirst, MD; Joseph Heitman, MD; David Hsu, MD; Michael Kelly, MD; Christopher Kontos, MD; Joanne Kurtzberg, MD; Madan Kwatra, MD; Robert Lefkowitz, MD; Rodger Liddle, MD; Corinne Linardic, MD; Louise Markert, MD; Hiroaki Matsunami, MD; Larry Moss, MD; Susan Murphy, MD; Barry Myers, MD; Thomas Ortel, MD; Edward Patz, MD; Ann Pendergast, MD; Thomas Petes, MD; Geoffrey Pitt, MD; Salvatore Pizza, MD; John Sampson, MD; Patrick Seed, MD; Victoria Seewaldt, MD; Bruce Sullenger, MD; Beth Sullivan, MD; Raphael Valdivia, MD; David Walmer, MD; J. Brice Weinberg, MD; Hai Yan, MD; Tso-Pang Yao, MD; Yunyan Zhang, MD

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: Andrew Berchuck, MD; Gerard Blobe, MD, PhD; Christopher Counter, PhD; Sandeep Dave, MD, MS; Gayathri Devi, MD; Mark Dewhirst, PhD; MD; Matthias Gromeier, PhD; David Hsu, MD, PhD; Michael Kelley, MD; Joanne Kurtzberg, MD; Corinne Mary Linardic, MD; Jeffrey Marks, PhD; Donald Patric McDonnell, MD; Susan Murphy, PhDEdward Patz, MD; Anne Marie Pendergast, PhD; Sal Pizzo, MD, PhD; John Howard Sampson, MD, PhD; Xiao-Fan Wang, 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; Christopher Counter, PhD; Sandeep Dave, MD; Mark Dewhirst, PhD; Katherine Garman, MD; Matthias Gromeier, PhD; Shiao-Wen David HSU, MD; Michael Kelley, MD; David Kirsch, MD, PhD; Joanne Kurtzberg, MD; Jeffrey Marks, PhD; Donald McDonnell, MD; Edward Patz, MD; Anne Marie Pendergast, PhD; Sal Pizzo, MD, PhD; John Sampson, MD; Victoria Seewaldt, MD; Xiao-Fan Wang, MD; Daniel Wechsler, MDC, PhD; Hai Yan, MD; and Tso-Pang Yao 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: Vann Bennett, MD, PhD; Perry Blackshear, MD, PhD; Gerard Blobe, MD, PhD; Thomas Myron Coffman, MD; Christopher Counter, PhD; David D'Alessio, MD; Peter Fecci, MD; Michael Freemark, MD; Joseph Heitman, MD, PhD; Matthew Hilton, MD; Chay Titus Kuo, MD, PhD; Madan Kwatra, PhD; Roger Liddle, MD; Hiroaki Matsunami, PhD; Donald McDonnell, PhD; Christopher Nicchitta, PhD; Thomas L. Ortel, MD, Anne Marie Pendergast, PhD; Thomas Petes, PhD; Geoffrey Pitt, MD, PhD; Thomas Price, MD; Beth Ann Sullivan, PhD; Xiao-Fan Wang, 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: Diego Bohorquez, PhD; Nancie MacIver, MD, PhD; Larry Moss, MD; Deborah Muoio, PhD

MOLMED-305B. RESEARCH IN MOLMED - TRANSLATIONAL PHRAMACOLOGY.

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 are, or have 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: Daniel K. Benjamin, MD, PhD, MPH; Christopher Kontos, MD; Madan Kwatra, PhD; Robert J. Lefkowitz, MD; Donald Patrick McDonnell, PhD; James McNamara, MD; Paul Mosca, MD; Robert Noveck, MD, PhD; Edward Patz, MD; John Howard Sampson, MD, PhD; Bruce Sullenger, PhD; Emmanuel B. Walter, MD, MHS; David S. Warner, MD; Joe Brice Weinberg, BS, MD; and Kris Wood, PhD

Neurosciences Study Program

NSS-301B. RESEARCH IN NSS. Program Directors: Christopher Lascola, MD, and Peter Fecci, MD, PhD. Overview: The Neurosciences Study Program provides a multidisciplinary opportunity for third year medical students over the broad range of basic, clinical, and applied 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, neurooncology, brain tumor immunotherapy, 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, as well as brain tumor research. 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. Fecci 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: Richard Bedlack, MD; Nicole Calakos, MD, PhD; Carol Colton, PhD; Sharyn Anne Endow, PhD; Peter Fecci, MD, PhD; Kirby Gottschalk, PhD; Warren M. Grill, PhD; Ashraf Habib, MD; Michael M. Haglund, MD, PhD; Scott Huettel, PhD; Robert Eric Isaacs, MD, MD; Michael James, MD; Erich Jarvis, PhD; Yong-Hui Jiang, MD, PhD; Cynthia Kuhn, MD; Nandan Lad, MD, PhD; Christopher David Lascola, MD, PhD; Daniel Todd Laskowitz, MD; Wolfgang Liedtke, MD, PhD; Stephen Lisberger, MD; Donald C. Lo, PhD; James McNamara, MD; Mohamed Mikati, MD; Carrie Muh, MD; Miguel Angelo Nicolelis, MD; Jeffrey M. Petrella, MD; Geoffrey Pitt, MD, PhD; James M. Provenzale, MD; Dale Purves, MD; John H. Sampson, MD, PhD; Rochelle Schwartz-Bloom, MD; Jesse Haynes Pate Skene, MD; Kyle Walsh, PhD; Fan Wang, MD; and 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: ; Vadim Y. Arshavsky, PhD; Sanjay Asrani, MD; Catherine Bowes Rickman, PhD; Edward G. Buckley, MD; Pratap Challa, MD; Scott W. Cousins, MD; Sina Farsiu, MD; Michael A. Hauser, PhD; Glenn J. Jaffe, MD; Leon Herndon, MD, Anthony Kuo, MD; Stephen Lisberger, MD; Paloma Liton, PhD; Goldis Malek, PhD; Kelly Muir, MD; Grace Prakalapakorn, MD; Julia Rosdahl, MD; Vasanth Rao, PhD; Dan Stamer, PhD; Cynthia A. Toth, MD; Heather E. Whitson, MD

Pathology Study Program

PSP-301B. RESEARCH IN PSP. Program Director: Shannon J. McCall, MD.

Pathology is the study of disease, specifically including disease-associated structural and functional changes from the molecular to the macroscopic scale. Basic and translational pathology research enhances the clinical practice of pathology which includes both surgical pathology and diagnostic laboratory medicine. Mentors in this program have expertise in cell biology, hematology, immunology, metabolism, pulmonology, and molecular oncology including biomarker assays and high throughput sequencing. Communication of increasingly complex data requires advanced clinical informatics; this is also an area of departmental expertise.

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 departmental conferences and seminars. FACULTY: Soman N. Abraham, PhD; Michael B. Datto, MD, PhD; Maureane Hoffman, MD, PhD; Anand Lagoo, MD, PhD; Shannon J. McCall, MD; Roger McClendon, MD; Sara E. Miller, PhD; Salvatore V. Pizzo, MD, PhD; Alan D. Proia, MD; Herman F. Staats, PhD, Mary Sunday, MD, PhD; Dennis A. Clements, MD, PhD, MPH; Sheila Collins, PhD; Virginia B. Kraus, MD, PhD; H. Kim Lyerly, MD; and Joe Weinberg, MD

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

Primary Care Leadership Track

PCLT-301B. RESEARCH IN - PRIMARY CARE AND LEADERSHIP TRACK. Course Director: Anh N. Tran, PhD, MPH. The Primary Care Leadership Track (PCLT) offers students committed to primary care an opportunity to develop skills for patient centered care and community—engaged, population health improvement practice. Students explore the causes of health disparities, often through the lens of social determinants of health; develop a meaningful population health improvement research focus utilizing community/stakeholder engagement' and have an opportunity to practice team- based leadership skills useful in redesigning clinical programs to better serve patient needs at the individual and population levels.

FACULTY: Amy Abernethy, MD; Sarah Armstrong, MD; L. Ebony Boulware, MD, MPH; Lenore Corsino, MD; Matthew Dupre, PhD; Geraldine Dawson, PhD; David Edelman, MD; Gary Maslow, MD; Lloyd Michener, MD; Truls Ostbye, MD, MPH, Kathryn Pollak, PhD; Dev Sangvai, MD, MBA; John Schmitt, MD; Kevin Shah, MD; Nirmish Shah, MD; Mina Silberberg, PhD, Geeta Swamy, MD; and Heidi Kay White, MD

Jared Lazarus

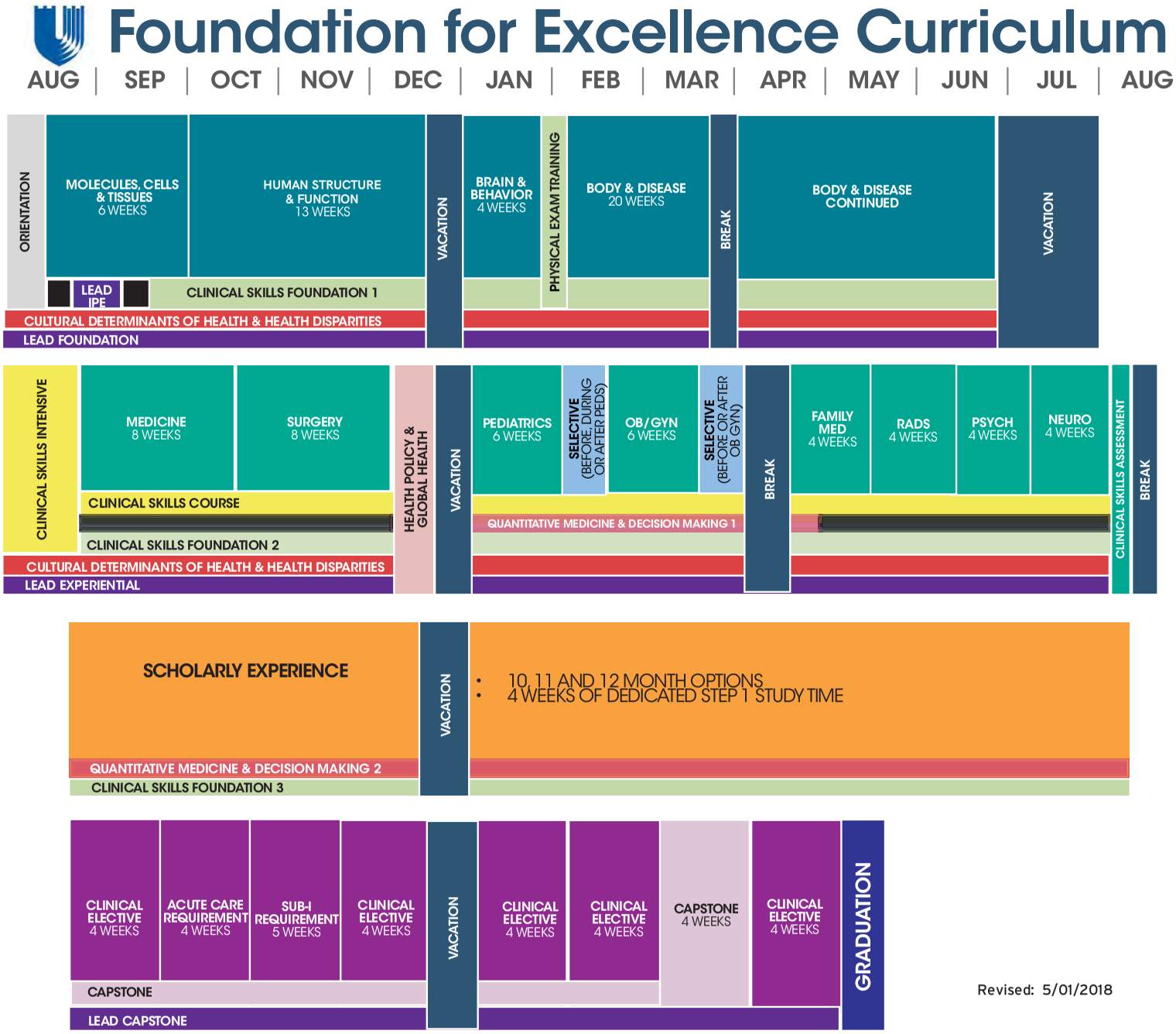
Doctor of Medicine Program

2018-19 Academic Calendars

Academic Calendar Key

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

Foundation for Excellence Curriculum



Revised: 5/01/2018

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 among students. For specific details about the curriculum or for information about the Primary Care Leadership or LIC Track please consult the Bulletin at *http://registrar.duke.edu/university-bulletins/school-medicine*.

2018-2019 Academic Calendar

Doctor of Medicine Program: First Year

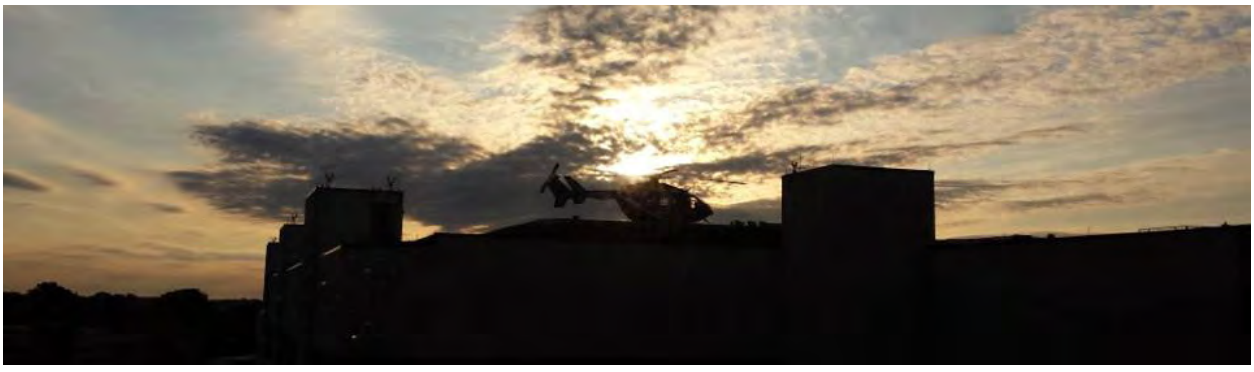
Fall 2018

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

July	
30-August 3	M-F Orientation to first year—Mandatory attendance
August	
3	F AOA Day—Mandatory attendance
6	M Begin class, Molecules, Cells, & Tissues
13	T Begin Cultural Determinants of Health & Health Disparities
September	
3	M Labor Day, student holiday
6	Th Interprofessional Experience
11	T Begin class, Clinical Skills Foundation I
14	F End class, Molecules, Cells, & Tissues section 61
17	M Begin class, Human Structure and Function, section 16
October	
31	W Registration/Drop/Add for Spring term opens
November	
6	T Registration/Drop/Add for Spring term closes
20	T 6 p.m., Begin Thanksgiving student holiday
26	M Class resumes Human Structure and Function, section 16
December	
14	F 5 p.m., End class, Human Structure and Function. Begin Winter Break for 1st year Medical Students

Spring 2019

January	
1	T New Year's Day holiday observed
2	W Begin class, Brain & Behavior, section 16
21	M Martin Luther King, Jr., student holiday
28	M End class, Brain & Behavior, section 16
29	T Begin class, Physical Examination period (Intensive Learning Period)
31	Th 5 p.m., End class, Physical Examination Period (Intensive Learning Period)
February	
1	F Begin class, Body & Disease, section 16
March	
TBD	Sa 8 p.m., Student/Faculty Show
TBD	Sa Medical Families Day
23-31	Sa-Su Spring Break for MS1's
April	
1	M Resume Body & Disease, section 16 (return from Spring Break)
May	
27	M Memorial Day Holiday—student holiday
June	
25	T End class, Clinical Skills Foundation I
28	F 5 p.m., End class, Body & Disease, section 16



Lauren Dincher

2018-2019 Academic Calendar

Doctor of Medicine Program: Second Year

Fall 2018

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

July	
30	M Begin Clinical Skills Course—Intensive, 8 a.m.
31-August 7	T-T MS2 students register online for Fall selectives
August	
3	F AOA Day—Mandatory attendance
17	F End Clinical Skills Course Intensive
20	M Begin sections 21, 41, 61, and 81
22	W Begin Clinical Skills Course
31	F End section 21
September	
3	M Labor Day, student holiday
4	T Begin sections 22 and 62
12	W Begin Clinical Skills Foundation II
14	F End sections 22 and 41
17	M Begin sections 23 and 42
28	F End sections 23 and 61
October	
1	M Begin section 24
10	W End section 81, except PEDS
12	F End sections 24, 42, 62, and 81 PEDS
15	M Begin sections 25, 43, 63, and 82
26	F End section 25
29	M Begin sections 26 and 64
31	W 8:30 a.m., Online registration for MS2 spring selectives opens
November	
6	T 1 p.m., Online registration for MS2 spring selectives ends
9	F End sections 26 and 43
12	M Begin sections 27 and 44
21	W End sections 27 and 63
21	W Noon, Begin Thanksgiving holiday
22-25	Th-Su No classes due to Thanksgiving holiday
26	M Begin section 28
December	
7	F End sections 28, 44, 64, and 82
8	Sa Begin Winter Break

Spring 2019

January	
1	T New Year's Day, student holiday observed
2	W Begin sections 21, 41, 61, and 81
2	W Begin QMDM I
11	F End section 21
14	M Begin sections 22 and 62
21	M Martin Luther King, Jr., student holiday
25	F 6 p.m., End sections 22 and 41
28	M Begin classes in sections 23 and 42
February	
8	F End classes in sections 23 and 61
11	F Begin section 24
20	W End section 81, except PEDS
22	F End sections 24, 42, 62, and 81 PEDS
25	M Begin sections 25, 43, 63, and 82
March	
8	F End section 25
11	M Begin sections 26 and 64
13-19	W-T MS2 students register for Summer 2018 selectives (students will receive email notification)
22	F End sections 26 and 43
25	M Begin sections 27 and 44
April	
5	F End sections 27 and 63
8	M Begin section 28
17	W End section 82
17	W End QMDM I
19	F End sections 28, 44, 64, and 82 PEDS
20	Sa Begin Spring Break
28	Su End Spring Break

2018-2019 Academic Calendar

Doctor of Medicine Program: Second Year (continued)

Summer 2019

April	
29	M Begin sections 21, 41, 61, and 81
May	
10	F End section 21
13	M Begin sections 22 and 62
24	F End sections 22 and 41
24	F Noon deadline for rising third-year (MED3) students Registration form submission to third-year coordinator
27	M Memorial Day holiday, student holiday
28	T Begin sections 23 and 42
31	F Online Registration—3rd Year, Fall ends
June	
7	F End sections 23 and 61
10	M Begin section 24
12	W End Clinical Skills Foundation 2
June	
19	W End section 81, except PEDS
21	F End sections 24, 42, 62, and 81 PEDS
24	M Begin sections 25, 43, 63, and 82
26	M RCR and 3rd Year Orientation—Mandatory attendance
July	
4	Th Independence Day—student holiday
5	F End section 25
8	M Begin sections 26 and 64
19	F End classes in sections 26 and 43
22	M Begin sections 27 and 44
August	
2	F End sections 27 and 63
2	F AOA day—Mandatory attendance
5	M Begin section 28
7	W End Clinical Skills & Practice Year 2
10	Sa Advisory Dean 2nd Year Retreat
14	W End section 82, except PEDS
16	F End sections 28, 44, 64, and 82 PEDS

***Mandatory Clinical Skills Assessment due by December 2019 following 2nd year*

Beky Branagan

2018-2019 Academic Calendar

Doctor of Medicine Program: Third Year

Fall 2018

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

August	
3	F AOA Day—Mandatory attendance
20	M Third Year Begins. Start dates must be approved prior to scheduled third year registration due date
September	
3	M Labor Day, student holiday
15	Sa MS3 study period ends
17	M MS3 Begin section 42
October	
1	M Begin Quantitative Medicine and Decision Making II
14	Sa MS3 End section 42
16	M MS3 Begin section 43
31	W 8:30 a.m., MS3 registration for Spring opens
November	
6	T 1 p.m., MS3 registration for Spring closes
10	Sa MS3 End section 43
12	M MS3 Begin section 44
12	M End Quantitative Medicine & Decision Making II
22-25	Th-Su Begin Thanksgiving student holiday
26	M Classes resume
December	
14	F MS3 Fall term ends, section 44
14	F End Quantitative Medicine & Decision Making II
15	Sa Winter Break begins

Spring 2019

January	
1	T New Year's Day, student holiday observed—end vacation
2	W Research resumes
21	M Martin Luther King, Jr., holiday, student holiday
March	
TBD	W 8:30 a.m.-T 1 p.m., Registration for rising MED, Summer
April	
11-17	W 8:30 a.m.-T 1 p.m., Registration for rising MED3, Fall
19	F End third year, Spring term (=16 weeks of third year research from first day of classes)
22	M Begin Summer term *(dates subject to change)*

Summer 2019

May	
27	M Memorial Day holiday, student holiday
July	
4	Th Independence Day, student holiday
August	
2	F AOA day—Mandatory attendance

Research Ethics due 30 days after start date

***Mandatory Medical Statistics Course must be completed by December 10th 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)

2018-2019 Academic Calendar

Doctor of Medicine Program: Fourth Year

Summer 2018

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

March	
14-20	W-T 8:30 a.m., Registration for rising MED4, Summer *(dates subject to change)*. Registration ends at 1 p.m. on Tuesday, March 20
April	
4-10	W-T 8:30 a.m., Registration for MS4, Fall *(dates subject to change)*. Registration ends at 1 p.m. on Tuesday, April 10
11	W 8:30 a.m., Drop/Add for Fall opens
16	M Begin classes in sections 81 and 41
May	
12	Sa Noon, End classes in section 41
14	M Begin classes in section 42
28	M Memorial Day holiday, student holiday
June	
5	T 1:00 p.m., Drop/Add ends for Summer, sections 82, 43, and 44 (MS4)
9	Sa Noon, End classes in sections 81 and 42
11	M Begin classes in sections 82 and 43
July	
4	W Independence Day, student holiday
7	Sa Noon, End classes in section 43
9	M Begin classes in section 44
August	
3	F 1 p.m., Drop/Add for Fall ends, sections 41, 42, and 81 (MS4)
3	F AOA day—Mandatory attendance
4	Sa Noon, End classes in sections 82 and 44

Fall 2018

August	
3	F AOA day—Mandatory attendance
20	M MS4 Begin sections 41 and 81
September	
3	M Labor Day, student holiday
15	Sa MS4 End section 41
17	M MS4 Begin section 42
22	Sa Noon, MS4 Grades for 41 are due
28	F 1 p.m., Drop/Add for Fall, sections 82, 43, and 44 (MS4)
October	
13	Sa MS4 End sections 42 and 81
15	M MS4 Begin sections 43 and 82
31	W 8:30 a.m., MS4 registration for Spring opens
November	
6	T 1 p.m., Registration ends
7	W 8:30 a.m., Drop/Add for Spring opens
10	Sa MS4 End section 43
13	M MS4 Begin section 44
22-25	Th-Su Begin Thanksgiving, student holiday
26	M Classes resume
December	
8	Sa MS4 End sections 44 and 82
8	Sa Winter Break begins
14	F 1 p.m., MS4 online Registration for Spring ends, sections 81, 41, and 42

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)

2018-2019 Academic Calendar

Doctor of Medicine Program: Fourth Year (continued)

Spring 2019

January	
1	T New Year's Day, student holiday observed
2	M MS4 Begin sections 41 and 81
21	M Martin Luther King, Jr., student holiday observed
26	Sa MS4 End section 41
28	M MS4 Begin section 42
February	
9	F Drop/Add for Spring ends, sections 43, 44, and 82 closes (MS4)
23	Sa End sections 42 and 81
25	M Begin section 43—Capstone—Mandatory

March	
15	F MS4 Match Day (tentative date)
22	F MS4 End section 43—Capstone
25	M MS4 Begin section 44
April	
20	Sa MS4 End section 44
May	
3	F 1:00 p.m., All MS4 Grades are due (to clear students for graduation)
10-12	F-Su Graduation activities

Beky Branagan

Doctor of Physical Therapy

Jared Lazarus

DPT Faculty

Chief: Michel D. Landry, BScPT, PhD
Program Director: Chad Cook, PT, PhD, MBA

Laura Case, PT, DPT, MS, PCS, C/NDT; Richard Clendaniel, PT, PhD; Derek Clewley, PT, DPT, OCS; Kyle Covington, PT, DPT, PhD, NCS; Jody Feld, PT, DPT; Carol Figuers, PT, EdD; Adam Goode, PT, DPT, PhD; Tiffany Hilton, PT, PhD; Jeffrey Hoder, PT, DPT, NCS; Maggie Horn, PT, DPT, MPH, PhD; Katie Myers, PT, DPT; Amy Pastva, PT, PhD; Michael Reiman, PT, DPT, MEd, OCS, ATC, CSCS; Marcus Roll, PT, DPT, NCS, CBIS; Corey Simon, PT, DPT, PhD; Laura Stanley, PT, DPT

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; email: 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 regular application deadline for the 2018-2019 application cycle is October 15, 2018 and the early decision deadline is August 15, 2018.

Prerequisite Coursework

Six semester credits of biological sciences, 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, and six semester credits of psychology. 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 https://dpt.duhs.duke.edu/education/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 November 1 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 Program Director. Nondisclosure or falsification may be grounds for dismissal or degree revocation.

Students enrolled in the DPT Division will be required to undergo annual CBCs. In addition, sites conducting clinical education may require students to undergo additional background checks prior to undertaking their clinical experience. 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 Program Director 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: https://medschool.duke.edu/education/student-services/office-financial-aid/resources.

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; finaid@dm.duke.edu or at the Duke University SOM Office of Financial Aid website at https://medschool.duke.edu/education/student-services/office-financial-aid.

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. 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.

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.

Academic Progression and Requirements for Graduation

The faculty of the DPT program accepts responsibility for monitoring the academic and professional progress of each student enrolled in the program. The following policy describes the standards by which satisfactory academic and professional progress will be assessed, the determination of academic standing, and the requirements for successful completion of the DPT degree.

A. Attendance and Excused Absences

This is a professional education program at the graduate level, and these policies should be considered within a context of professional responsibility. Attendance in all classes is mandatory.

Physical therapy education prepares students for professional clinical practice. Our attendance policy is consistent with those at most clinical facilities. Lectures include didactic material, case presentation (often including patient demonstrations), and informal discussions. Much of the material presented cannot be obtained from written materials that are generally available or accessible from a single source. Acquisition of the skills of physical therapy practice is achieved through direct observation, practice, and feedback from an instructor who is skilled in their application. The laboratory sessions within the curriculum are designed to teach skills that are critical to physical therapy practice. If a student misses a laboratory session, they lose the opportunity to learn the specific skills taught during that session. There is no easy mechanism for remediation. In addition, the student's partner is penalized by the absence because most skills are practiced with the students working in pairs. When one student is absent, the other student has lost a partner with whom to practice. For these reasons, we expect students to attend all class and laboratory sessions.

Class calendar and schedules:

1. Students will receive a class schedule for required classes and events each semester. Students are expected to attend all those listed.
2. A calendar of the DPT program has been provided. Students are expected to follow this calendar with respect to dates and hours listed for holidays and vacations, unless modifications are indicated.

Student communication of absences:

1. Students should submit requests (via the Student Absence Request Form on the Student Portal) for approval of planned absences (such as religious events) to the Director of Curriculum no later than the first week of the semester in which the absence will occur. Requests made on short notice will likely not be approved.
2. A student who is ill and cannot attend required classes should use the link on the Student Portal to communicate the absence prior to class. The DPT Division encourages students to seek any necessary medical attention. Any student who becomes ill with a fever (e.g. influenza) should only return to the class/clinic after they have been fever-free for 24 hours. A doctor's note is required for absences greater than one day.
3. Instructors expect promptness. Students are expected to be in the designated class area at the scheduled beginning class time and to return promptly following breaks.
4. When laboratory classes are scheduled, arrive dressed in appropriate lab attire at beginning of class time.

B. Academic Performance

The grading system for the DPT program consists of two scales.

Didactic Courses and Clinical STEPs® Courses

For all didactic courses and the five Clinical STEPs® courses in Years 1 and 2 of the curriculum, the following grading system will be used:

P	Pass
LP	Low Pass
F	Fail
I	Incomplete

Terminal Clinical Experience Courses

For all 3rd year clinical experience courses in the curriculum, the following grading system will be used:

P	Pass
F	Fail
I	Incomplete

Pass-Low Pass-Fail Grades

The rounded raw score range for establishing passing or failing grades will range from 0 to 100 with a score of 70 to 79 as a Low Pass and 80 and above established as a Pass grade. A raw score of less than 70 will result in a Fail 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.

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. A student may appeal a failing grade and withdrawal from the program (see section E 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.

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 Program Director's discretion, for the following reasons:

1. Documented student illness that prevents the student from completing the required work in the semester in which the course is offered.
2. 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.
3. 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.
4. 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 terminal clinical experience.

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 Program Director 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.

C. 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 enrolled students 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. A pattern of professional behavior concerns may result in formal verbal and written warnings. Professional behavior that is not corrected by the student following this policy may result in withdrawal from the program.

D. 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 they have earned no more than one LP grade in all courses. 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 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:

1. A student who successfully appeals a failing course grade.
2. A student who has earned two LP grades in any didactic courses.
3. A student who earns a grade of LP in any STEPs® course.
4. A student who is at risk for three LP grades in didactic courses (The student will return to Good Academic Standing at the end of the semester if the student does not meet any of the above warning criteria).

The Vice Dean for Education will notify the student that his/her performance will be monitored, and that future poor performance may result in withdrawal from the program.

E. Determination of Professional Behavior Standing

Good Professional Behavior Standing

The student is considered to be in Good Professional Behavior Standing if they 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. Faculty will utilize the DPT Professional Behavior Reporting System to track specific issues. They will also provide specific feedback and instruction to assist with correction of the student's behavior.

Good Professional Behavior Standing with Warning

If a pattern of professional behavior concerns emerges or one particularly egregious behavior is reported, the DPT program leadership may issue a verbal warning to the student that will indicate the reasons for the warning as well as the Generic Abilities/Behavioral Criteria and/or Professional Core Values that require improvement. (verbal warning 1) If an additional professional behavior concern or behavior occurs, the DPT program leadership may issue a formal written notification that will indicate the reasons for the warning as well as the Generic Abilities/Behavioral Criteria and/or Professional Core Values that require improvement. (written warning 1). The DPT Program Director will notify the student that his/her behavioral performance will be monitored, and that future poor performance may result in withdrawal from the program. A third concerning professional behavioral event (written warning 2) is grounds for withdrawal from the program.

F. Withdrawal

A student who fails to demonstrate successful progress in academics or professional behavior will be withdrawn from the program.

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

The faculty of the DPT program will use the following standards for withdrawing a student from the program.

1. A student will be automatically withdrawn following the attainment of a failing grade in any one course in the curriculum.
2. A student who earns two LP grades in the first year STEPs® courses; or two LP grades in the 2nd year STEPs® courses.
3. A student who earns three LP grades in any didactic courses.
4. A student has received 2 written professional behavior warnings.
5. 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 on withdrawn status from the program will be notified in writing by the Vice Dean for Education. Students may appeal this decision by indicating in writing to the Vice Dean for Education: (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 Vice Dean for Education via United States Postal Service Certified Mail and by email, within three weeks of notification of academic status.

Upon receipt of the appeal the Vice Dean for Education will review the appeal with consultation from the Division Vice-chiefs, the student's advisor, and the appropriate course director. The Vice Dean for Education will determine if the appeal of withdrawal should be granted. If the student's appeal of his/her withdrawal is approved, the Vice Dean for Education 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 Vice Dean for Education will notify the student of the decision on the appeal in writing within three weeks of receipt of the appeal.

G. Progression and Academic Standing

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 Program Director.

Earned grades and professional behavior are considered in determination of the student's academic standing.

H. Requirements for Graduation

Academic Standards for Graduation

The following standard must be met by the student to successfully complete the DPT program, earn the Doctor of Physical Therapy degree, and participate in all DPT graduation events: Completion of 122 course credits with a passing grade, including all required didactic and clinical education courses with satisfactory professional behavior.

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), completed in 33 calendar months. Under extraordinary conditions, a student may be permitted a time limit of two semesters of full- 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 Program Director who will review each case.

The student is expected to make continuous and successful progress towards 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 I (incomplete) course grade, except when the succeeding semester is a clinical education course. Under extraordinary circumstances, a student may apply for an exception to the typical pattern of progress towards degree requirements.

DPT Exit Requirements for Graduation

In order to graduate, all DPT property distributed to the student must be returned to the DPT Division.

Voluntary Withdrawal Policy

Students who voluntarily withdraw or take a leave of absence from the DPT Division will be required to submit a written request, via certified United States Mail, to the Program Director of the Division. The postmark date of the request will be the date used in determining the official date of the withdrawal or leave of absence and in determining the refund of tuition and fees and the assignment of grades.

Once the request is received, via certified United States Mail, by the Program Director, the Program Director will inform the Curriculum Coordinator who will then notify the Offices of the Registrar and Financial Aid in the School of Medicine. The student is required to contact these offices to ensure that that they have completed all required interviews and have fulfilled any responsibilities with regard to this process. The Student Exit Interview/Meeting Form needs to be signed and dated by representatives from the Offices of the Registrar and Financial Aid. The student's permanent academic record will reflect that he or she was enrolled for the term and that he or she withdrew or took a leave of absence on the effective date of request.

Withdrawal Grades

Assignment of grades for withdrawing students is made on the basis of current grading policies detailed in the appropriate DPT Student Handbook. 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 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 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.

Financial Aid

Recipients of financial aid, scholarships, or short-term loans for payment of fees or expenses for the semester that the student leaves DPT must be approved by the Financial Aid Office before they will be allowed to complete the exit process. Such students will be required to participate in an exit interview.

Returning to DPT

With the exception of students who have taken a leave of absence, any students who have voluntarily withdrawn from the program and desire to return to the DPT Division will need to apply for readmission.

Les Todd

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 terminal clinical experiences (thirty-six weeks). Clinical experiences 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 STEPs® 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 STEPs® 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 621 (Clinical STEPs® III)	2
PT-D 622 (Evidence-Based Practice I)	2
PT-D 623 (Cardiopulmonary Patient Management)	2
PT-D 624 (Integumentary Patient Management)	2
PT-D 625 (Diagnostic Imaging)	2
PT-D 626 (Assessing Outcomes of Care)	2
PT-D 627 (Physical Therapist Interventions I)	2
Total Course Credits	**14**

Year Two

4th Semester Fall	
PT-D 701 (Clinical STEPs® 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 STEPs® V)	2
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	**15**

6th Semester Summer	
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)	3
PT-D 725 (Elective)	2
PT-D 726 (Elective)	2
Total Course Credits	**11**

Year Three

PT-D 801 (TCE I)	12
PT-D 802 (TCE II)	12
PT-D 803 (TCE III)	12
PT-D 804 (Professional Development III)	1
Total Course Credits	**37**
Total Course Credits for Degree	**122**

Courses of Instruction

PT-D 601. Clinical STEPs® I. Clinical Student Team Experience in Practice (STEP) is the first in a series of five 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-semester 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 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 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 human body and the location of important bony landmarks, joint spaces, muscles, ligaments, bursae, nerves, vessels and the embryological origins of organ systems. 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. The course 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 teamwork. Credit: 2.

PT-D 611. Clinical STEPs® II. Clinical Student Team Experience in Practice (STEP) is the second in a series of five 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 team-based learning activities. The overall goal of this course is the same as the first in this sequence (PT 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. This framework is primarily anatomical, with an emphasis on gross anatomy and the relationships between the musculoskeletal, neurological, and vascular systems of the human body. PT612 will provide a comprehensive survey of the neuroanatomy and neurophysiology of the central nervous system. PT612 will also lightly cover the microanatomy, embryology and pathology of the nervous system. In the end, learners will command comprehensive 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. The overall goal of the Applied Physiology two-course sequence (PT-D 603 and PT-D 613) is to provide the foundational basis for understanding the body's physiological responses to physical activity. At the completion of the sequence, the student 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 second course in the sequence, PT-D 613 Applied Physiology II, concentrates on the following topics: a) endocrine, GI, renal, and reproductive organ systems physiology and responses to exercise; b) enhancement of energy transfer capacity through anaerobic and aerobic training and muscle strength training; c) influence of environmental stress such as altitude and thermal stress on exercise capacity; d) exercise, successful aging, and disease prevention; and e) clinical applied physiology as it pertains to major pathologies such as cardiovascular disease, diabetes, cancer, common musculoskeletal injuries, etc. 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 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 and standardized patients. These skills will be further developed in their STEP 2 experience. Students will give and receive feedback in a group format 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, practiced and applied to actual patient cases. 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 STEPs® III. DPT STEPs® is a series of five 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 procedures, diagnostic procedures, goal setting, and interventional strategies. Successful completion of the course requires the ability to synthesize and integrate information from this course with prerequisite and other related courses in a variety of cardiovascular and pulmonary case-based problem-solving experiences. The didactic portion of the course provides the background to make evidence-based clinical decisions in examination and treatment of patients with a wide variety of cardiovascular and pulmonary conditions. The practicum portion 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 conditions. 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, relaxation and stress management, soft tissue mobilization and massage techniques. Credit: 2.

PT-D 701. Clinical STEPs® IV. DPT STEPs® is a series of five 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, cultural competency and self-awareness, which are reinforced by experiential learning, self-reflection and work with Standardized Patients. Students will 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 is the first part of a two-semester course in musculoskeletal patient management. 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. This course introduces the student to musculoskeletal examination, evaluation, diagnosis, prognosis and intervention for impairments, functional limitations and disability in clients with pathologies of the cervical spine, thoracic spine, shoulder and upper extremities. Credit: 3.

PT-D 705. Neurological Patient Management I. Advanced clinical knowledge and skills are needed for physical therapist evaluation and management of complex neurological disorders. The Neurological Practice Management (NPM) Series includes: the etiology, epidemiology,

pathogenesis, and clinical presentation of common neurological conditions and injuries; evaluation procedures to define impairments and limitations in activity and participation; and development of plan of care including interventions and management 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), amytrophic 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. This course supports the patient management courses that have been completed or are concurrently occurring. The course provides an opportunity for students to learn about a variety of interventions that are appropriate for patients with musculoskeletal and/or neuromuscular impairments. In this course the student will learn physical therapist interventions associated with: pain management and neural tissue stimulation, including ultrasound and electrical stimulation. This lab-based course will allow students to be introduced to and practice a variety of therapeutic interventions for patients, including, modulation of tone, patient handling skills, functional transitions and gait training. Credit: 3.

PT-D 711. Clinical STEPs® V. DPT STEPs® is a series of five 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 712. Health Policy and Health System Design. 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 revisit aspects of the Profession's Core Values as they set goals for their professional careers. Students will become familiar with post-professional training opportunities including residencies and specialization. Legal and ethical practice as physical therapists will be discussed and students will work in teams to solve complex clinical problems that they are likely to encounter. The Core Value for Excellence will be developed through a subunit focused on clinical reasoning theory and practice. Students will utilize their communication skills to practice the expectations of culturally competent care. Student teams will conduct a semester-long Advocacy project to instill the Professional Core Value of social responsibility. Credit: 2.

PT-D 714. Musculoskeletal Patient Management II. This is the second part of a two-semester course in musculoskeletal patient management. This course introduces the student to musculoskeletal examination, evaluation, diagnosis, prognosis and intervention for impairments, functional limitations and disability in clients with pathologies of the lumbar spine, pelvis and lower extremities. 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 neuroanatomy, 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 of varied Physical Therapist interventions. Special topics related to interventions for neurological and musculoskeletal issues include: chronic pain management, interventions and education for patients with arthritis, and accommodations for driving and vision needs for patients. In addition, students will learn about Pilates-based Physical Therapy, skills for providing patient care using the aquatic environment, and special obstetrical and 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. Teams will research and present evidence for selected Integrative Medicine topics. 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: 3.

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. TCE I, II, III. This is a series of three consecutive clinical experiences occurring in the third year. Each 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. Professional Development III is the third in a three-course series that has as its focus the development of professional behaviors, knowledge, and values in the student. The course will be conducted to coincide with the Fall and Spring semester of the third year of the program, while students are completing 36 weeks of terminal clinical experiences. In this course students will complete the objectives of the Student Portfolio Project. They will also engage in required and optional professional learning activities that will model the life-long self-assessment and learning process that is the hallmark of a true professional physical therapist. Credit: 1.

DPT Foreign Educated Physical Therapist Course

Director of Foreign Educated Physical Therapist Course (FEPTC): Michel D. Landry, BScPT, PhD

The Duke Doctor of Physical Therapy (DPT) Foreign Educated Physical Therapist course provides internationally educated and licensed physical therapists with an overview of the health care system across the United States, and the culture and context in which physical therapy is practiced. It is assumed that participants in this online course are individuals who are seeking to establish physical therapy educational equivalency in the United States, and who subsequently are planning to sit for the National Physical Therapy licensure exam. The course is offered in the fall, spring and summer semesters.

Admission Requirements

This course is open to internationally educated physical therapists that meet the English Language requirements below. Proof of graduation from a physical therapy education program, and/or licensure if applicable, is a requirement to participate in this course. Participants will also need to ensure that they will have full access to a laptop or desktop computer during the course (using a phone or tablet is not sufficient), and full 24/7 access to high speed internet.

Language Requirements

English proficiency is an absolute minimum standard and is critical for success in this course and for practice as a physical therapist across the United States. While there are no specific requirements for English language proficiency to participate in this course (i.e. TOEFL), it is expected that all applicants will be fluent in reading, writing, and speaking in the English language. There will not be any special provisions given to participants who fail to keep pace with the course, or with their fellow participants, because of English language difficulties. All participants are expected to self-assess their competency in English prior to beginning this course.

Application

Detailed instructions and the online application can be found on the program's website at https://dpt.duhs.duke.edu/education/foreign-educated-physical-therapy-course.

Attendance

Students are required to participate in all modules. However, because this program is completely online with all lecture material pre-recorded, it is the student's responsibility to ensure all lectures are viewed. All online coursework such as discussion boards are to be completed by the date provided in the course syllabus.

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 (email 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.

Code of Conduct

Students enrolled in the Duke DPT Foreign Educated Physical Therapist course 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.

Grading

This course utilizes a Pass/Fail grading scale. The passing threshold is 70%.

Withdrawals and Refunds

A course may be dropped at the student's discretion during the first week 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).

Course of Instruction

PT-D 901. Foreign Educated PT Course. The US has been an attractive and desirable destination for many internationally educated physical therapists for decades, and although internationally trained physical therapists are often well trained and skilled, they frequently do not have the background or knowledge of the nuances and unique complexities that exist within the US health care systems, and the multiple roles that physical therapists can and do perform along the continuum of care. A better understanding of these complexities, and creating opportunities to discussion and debates, can improve the probability of success as the internationally educated clinician transition towards licensure within the US, and would also promote a welcoming environment for further growth for internationally educated physical therapists in our country. As such, we propose an online course that we have titled "Healthcare Policy, Practice and Regulation in the United States: A Course for Internationally Educated Physical Therapists." The main objective of this course is to provide foundational knowledge of the complexities and nuances of US-based physical therapy policy, practice and regulation that are critical to moving forward towards licensure and effective practice in the US. Credit: 2

Jared Lazarus

2018-2019 Academic Calendar

Doctor of Physical Therapy: Year One

Fall 2018 - Session 1

16 weeks (14 didactic, 1 clinical, 1 vacation)

August	
14-17	T-F Orientation
20	M Session 1 begins
September	
3	M Labor Day holiday
November	
19-23	M-F Thanksgiving Break
December	
7	F Session 1 ends 1-week Intersession Break

Spring 2019 - Session 2

15 weeks (13 didactic, 1 clinical, 1 vacation)

January	
2	W Session 2 begins
21	M Dr. Martin Luther King Jr. holiday
February	
18-22	M-F Spring Break
April	
12	F Session 2 ends 1-week Intersession Break

Summer 2019 - Session 3

16 weeks (13 didactic, 2 clinical, 1 vacation)

April	
22	M Session 3 begins
May	
27	M Memorial Day holiday
June	
17-21	M-F Summer Break
July	
4	Th Independence Day holiday
August	
11	F Session 3 ends 1-week Intersession Break

Doctor of Physical Therapy: Year Two

Fall 2019 - Session 4

16 weeks (14 didactic, 1 clinical, 1 vacation)

August	
26	M Session 4 begins
September	
2	M Labor Day holiday
November	
18-22	M-F Thanksgiving Break
December	
13	F Session 4 ends 3-week Intersession Break

Spring 2020 - Session 5

16 weeks (13 didactic, 2 clinical, 1 vacation)

January	
6	W Session 5 begins
20	M Dr. Martin Luther King Jr. holiday
February	
24-28	M-F Spring Break
April	
24	F Session 5 ends 1-week Intersession Break

2018-2019 Academic Calendar

Doctor of Physical Therapy: Year Two (continued)

Summer 2020 - Session 6

11 weeks (11 didactic)

May	
4	M Session 6 begins
25	M Memorial Day holiday

July	
3	F Independence Day holiday
17	F Session 6 ends 2-week Intersession Break

Doctor of Physical Therapy: Year Three

Summer 2020 & Fall 2020 - Session 7

24 weeks (24 clinical)

August	
3	M PT 801 TCE I begins PT 804 Professional Development III begins
October	
23	F PT 801 TCE I ends 1-week Session Break
November	
2	M PT 802 TCE II begins
January	
22	F PT 802 TCE II ends 1-week Intersession Break

Spring 2021 - Session 8

13 weeks (1 didactic, 12 clinical)

February	
1	M PT 803 TCE III begins
April	
23	F PT 803 TCE III ends
May	
3	M PT 804 Professional Development II 1-week Intersession Break
9 (tentative)	Su Graduation

Please note: This calendar is subject to change.

Duke University

Master of Biomedical Sciences

Paula J. Alford

Assistant Dean for Premedical Education and Executive Director: Kathryn M. Andolsek, MD, MPH
Associate Directors: Leonor A. Corsino, MD, MHS; Maureen D. Cullins, AM; Judith C. Holder, PhD, BCC; Joseph A. Jackson, MD; Leonard E. White, PhD
Administrative Coordinator: Christie T. McCray, BS
Program Assistant: Jeremy D. Roberts, MHA

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 twofold: to educate and mentor individuals who will be highly competitive candidates for schools of medicine and related health science professions and to match these individuals with the best opportunities for success in the health professions and/or related biomedical fields. We aim to accomplish our mission by providing the best combination of academic preparation, patient-centered service learning, advising, and professional development.

The MBS program values diversity, self-awareness, service, learner well-being and teamwork. It aspires to foster curiosity, a joy and passion for learning, and individual and collegial professionalism.

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 U.G.P.A. (undergraduate GPA) of 3.2 from an undergraduate program. Grades earned through completion of post-baccalaureate studies are considered on an individual, case-by-case basis.

Applicants are not required to take the GRE, MCAT, or any other standardized test to be considered for admission. The application does have a place to record such scores if they have been taken and should the applicant choose to do so. Students who matriculate into the program are expected to provide all test scores as part of the advising process.

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 essay question responses, submission of the $50 application fee, and the following supporting documents: (1) a resume or curriculum vitae (uploaded within online application); (2) an unofficial transcript from each post-secondary institution attended (uploaded within online application); and (3) two letters of evaluation written by persons qualified to testify to the applicant's capacity for graduate work (solicited and submitted through the online application system). Please note that review of an application cannot commence nor can an admission decision be made until all the above materials are received and the application is considered complete.

Detailed application instructions can be obtained by sending an email 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, sterognosis, 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.

Financial Information

The MBS program practices a need-blind admissions process. Applicants to the MBS program are evaluated for admission without regard to their family's ability to pay. 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.

Tuition and Fees

Tuition for the 2018-2019 academic year is $45,291 for full-time study. On notification of acceptance, prospective MBS students are required to pay a nonrefundable program deposit of $250. 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, criminal background and 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 attendance per academic year.

To be considered for federal financial aid, eligible students must complete the Free Application for Federal Student Aid (FASFA). 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, emailing to finaid@dm.duke.edu, or by visiting the Duke University SOM Office of Financial Aid website at http://medschool.duke.edu/education/student-services/office-financial-aid.

Full cost of attendance budgets may be found on the Office of Financial Aid website: http://medschool.duke.edu/education/student-services/office-financial-aid.

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 on the Student Health website: https://studentaffairs.duke.edu/studenthealth.

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 EMT, 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 Semester 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. Annual influenza vaccination or an approved medical or religious exemption is required. 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 advisor. 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. If a student believes (s)he needs to be late or miss an activity, (s)he should email the course instructor in advance. Absences and tardiness may result in a lower courses grade.

Dress Code

Students should be aware of the dress codes of the various curricular components as described in the MBS Program Student Handbook. Student activities involving patient care require appropriate professional dress. Additional information can be found in the student handbook.

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 be 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 A, A-, B+, B, B-, C+, C, C-, D, F, or P (Pass)/F (Fail).

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. The appeal process is described in the MBS Program Student Handbook.

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, their interpersonal communication abilities, teamwork, professionalism including trustworthiness, adherence of their appearance to the program's dress code, 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 lower course grades, 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 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 and the student's advisor 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.

Assistant Dean of Learning Environment reviews student concerns, harassment and mistreatment. Dr. Nancy Knudsen serves in that role. Adverse events may be reported using this link: https://duke.qualtrics.com/SE/?SID=SV_0xINCG6gxBow5Rr

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 Academic Success Committee meets 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 DukeHub 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, ten courses comprise a required core curriculum of 34 credits. The remaining four credits are earned by completing one of two options for an individualized concentration: four credits of approved selective coursework or a mentored research/focused study or practicum project for which four credits are awarded. Students must complete 38 credits as follows:

10 required courses (34 credits)

HLTHSCI 501	Human Structure (5)
HLTHSCI 502	Cellular Sciences (5)
HLTHSCI 503	Organ Systems (5)
HLTHSCI 504, 505	Essentials of Health Practice and Professional Development I, II (3 each for 1 semester; 6 total)
HLTHSCI 518	Evidence Based Clinical Practice (4)
HLTHSCI 509	Medical Statistics (2)
HLTHSCI 510	Health Systems (3)
HLTHSCI 511	Enhanced EMT Training Course (2)
HLTHSCI 516	EMT Clinicals (2 total)

Selective concentration: (4 credits)

- **Option 1:** Research (including community-engaged research)/focused study with capstone paper (4)
- **Option 2:** Selected coursework. With permission of instructor/department and advisor approval (4)

Selective opportunities vary from year to year and are contingent upon faculty availability, approval from other Duke University programs, departments, schools, and institutes. Students are able to complete the selective concentration by selecting selective courses within the MBS program.

Students are strongly encouraged to consider completing the following two selectives to complete their 4 selective credits: HLTHSCI 533 and 535. Students are strongly discouraged from "overloading" so as not to dilute the academic performance in their required courses. Students who wish to take additional credits beyond the 38 credits require permission from both their advisor and the Program Director

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 longitudinal clinical practice—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) (Graded)

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) (Graded)

HLTHSCI 503 Organ Systems. The goal of this course is to develop a conceptual model for understanding the integrated function of major organ systems in the body, building upon the integration of human anatomy, embryology, histology, and the molecular and cellular sciences. The focus of this course will be on the physiology 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 human and non-human organs. 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 501 and 502. Credit: 5. (Degree requirement) (Graded)

HLTHSCI 504, 505 Essentials of Health Practice and Professional Development. This two course sequence 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 regular small group seminars with mentoring faculty and advisors, the course stresses active learning in a supportive environment. Students 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 demonstrate self-care and resiliency, practice conflict management and critical conversations, explore career alternatives, practice teamwork, and practice interviewing. Prerequisite: none; must be taken in sequence. Credit 3 each. (Degree requirement) (Pass/Fail)

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; analysis of variance; proportions; correlation; regression; analysis of covariance; and power and sample size. 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. Prerequisites: None. Credit: 2. (Degree requirement)

HLTHSCI 510 Health Systems. 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 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) (Graded)

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. Prerequisite: none. Simulations will be provided throughout the course. Following successful completion of the EMT-B, students must 1) pass the NC state EMT examination and submit evidence of their examination scores and subsequent NC State certification, and 2) 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 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) (Graded)

HLTHSCI 516 EMT Clinicals. 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 by participating in clinical care at an emergency department, urgent care, or other specialized service. The course will be concurrent with and supplemented by correlated content in the Cellular Sciences, Organ Systems, Essentials of Health Practice and Professional Development, and Evidence Based Clinical Practice courses. A minimum of 12 hours per month is required October-May. Prerequisite: HLTHSCI 511. Credit 2. (Degree requirement) (Graded)

HLTHSCI 517 EMT Selective. This selective course enables selected students to continue to refine and 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, in an Emergency Department or other specialized services. The ability of a student to enroll in this selective is contingent on its role in the individual student's educational plan and the availability of an approved site with appropriate supervision. Prerequisites: HLTHSCI 512 and permission of advisor and participating site. Credit variable 1-4. (Selective) (Graded)

HLTHSCI 518 Evidence Based Clinical Practice. This course consists of introductory skills in searching, critically reading and interpreting the medical literature. Students learn how to construct appropriate clinical questions to discover answers to challenging patient situations. The course features outside speakers who provide expertise on current topics in medicine and health care delivery followed by interactive large and small group exercises. The course culminates in the spring semester MBS Scholar's Day, for which each student prepares a required capstone scientific poster. Prerequisite: none. Credit 4. (Degree requirement) (Graded)

HLTHSCI 521 Community Health Engagement Practicum. This course provides students with a foundation in the principles and practices of population health improvement within the framework of community engagement. Participants are expected to first complete required readings and instructional modules that provide core knowledge regarding population health and community engagement. After appropriate orientation and onboarding with a community organization through Duke's Division of Community Health, students will then

gain further insight and skills during immersive weekly work assignments in the organization. The practicum culminates with completion of a work plan that demonstrates acquisition of specific skills necessary to plan, implement, or assess a population health improvement initiative that is community engaged patient/client-centered. The requirements for this product are derived from each student's individual learning plan in consultation with the host community organization and the Community Health Division (Dr. Anh Tran). Credit: 4. (Selective) (Graded)

HLTHSCI 523 DOCR Research Immersion. An unpaid short-term (1 semester) apprenticeship in an academic laboratory or clinical research setting. In general, students will be expected to dedicate approximately 10-12 hours per week to a mentored research project and submit a summary presentation that will be graded. The selective experience will enable students to generalize learning beyond the classroom, to reinforce the development of competence within an authentic setting, to obtain "workplace" mentorship, and to explore unfamiliar scientific fields and alternative career paths. In addition to the project time, students will meet biweekly during the semester to learn specific clinical research competencies in a didactic setting, to discuss broad research topics in a journal club setting, and to experience unique career and research-oriented discussions from clinical research faculty and staff. Credit 4. (Selective) (Graded)

HLTHSCI 524 Directed Study. Directed Studies are variable credit (1-3) selective pass/fail offerings that respond directly to students' expressed interests and needs and/or to the opportunistic availability of a resource, event, or activity of a timely or transient nature. Examples of potential topics include, but are not limited to, population health, the arts and medicine, food and health, spirituality and medicine, communicating science, ethics, and special topics in human anatomy. Students will complete required readings, and individual and group activities in keeping with individualized learning contracts approved by the course instructors and study mentor, and will produce a culminating final work product (e.g. paper, presentation, substantive artifact). Credit variable 1-3. (Selective)

HLTHSCI 525 Fundamentals of Ultrasound. Ultrasound has been used in medical education since the mid 1990s, initially focusing on anatomy and more recently to enhance training in physical diagnosis. This selective course aims to educate students in the basic principles (including physics) and core applications of bedside ultrasound. Students gain a thorough understanding of the sonographic anatomy and imaging technique of various anatomic regions through self-directed computer-based didactic sessions. Using the handheld SonoSim® Probe, students practice the psychomotor skills necessary to image these anatomic regions and acquire experience scanning pathologic states. Credit 2. (Selective) (Graded)

HLTHSCI 533 Planning for Health Professions Education. The journey to the health professions requires intentionality, planning, and strategy. This selective provides the participant with a "deep dive" into the creation of a competitive application for health professions education. Workshops include: the application process; managing disclosures in the application; the personal statement; identifying and rectifying "gaps" in the application. Each applicant will have a working draft of the personal statement (required for successful completion of the course) and an overview of the application by the appropriate health professional. Credit: 2. (Selective) (Graded)

HLTHSCI 535 Fundamentals of Learning: Theory and Practice. Success in the health professions requires good habits including time management, insight into learning styles, efficient study habits, and self-care. This selective provides exposure to evidence-based approaches to learning and memory from cognitive psychology and other disciplines (including cognitive training methods to facilitate how memory is encoded, consolidated and retrieved), and considers life style factors and practices that can support new learning (e.g., stress reduction,diet, exercise and sleep habits). Successful completion of the course includes: 1) development of a personal action plan that includes documentation of your methods to meet a specific learning goal (e.g., study plan for MCAT, GRE, DAT etc.), evidence of a commitment to a healthy lifestyle (e.g., exercise plan, dietary changes, meditation classes) and evidence of good sleep hygiene via a nightly diary and relevant checklists. The course includes eight workshop style sessions that include both in- and out-of-class assignments. Credit: 2. (Selective) (Graded)

HLTHSCI 536 Health Systems Selective. This selective will allow selected students an opportunity to individualize an area of health Systems such as population health, health policy, chronic disease management or health law. Interested students will work one-on-one with the instructor to identify a project with specific aims, implementation plan, timeline and outcome measure(s). Credit: 1-2 (Selective) (Graded)

2018-2019 Academic Calendar

Master of Biomedical Sciences

Fall 2018

July	
6	F Orientation
9	M Classes begin
August	
31-Sept. 3	F-M Fall recess and Labor Day holiday; no classes*
September	
4-7	T-F Classes resume; offsite EMT training in Kinston, NC
November	
21-23	W-F Thanksgiving recess; no classes*
26	M Classes resume
December	
17	F Fall semester classes end

Spring 2019

January	
7	M Classes begin
21	M Martin Luther King, Jr. holiday; no classes*
March	
11-15	M-F Spring recess; no classes
18	M Classes resume
May	
3	F Spring term classes end*
10-12	F-Su Duke University Commencement weekend
11	Sa MBS graduation exercises
12	Su University graduation exercises

Sonja Boergmann

Master of Biostatistics Program

Les Todd

Department of Biostatistics and Bioinformatics

Department Chair: Elizabeth R. DeLong, PhD
Director of Graduate Studies: Megan L. Neely, PhD
Program Coordinator: Kendall Mincey

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 School of Medicine 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.

To allow students to tailor their education to their post-graduation goals, Duke's Master of Biostatistics Program offers 3 tracks: Clinical and Translation Research (CTR) Track for students who plan to gain employment as a collaborative biostatistician in an academic or industry setting; Biomedical Data Science (BDS) Track for students who would like to blend statistics and computer science; and Mathematical Statistics (MS) Track for students who plan to enroll in a PhD program in biostatistics or similar field.

Program of Study

The master of biostatistics degree requires a total of 42 course credits, including 35 course credits of coursework graded on an A-F scale, a two-semester credit/no credit career and professional development course worth one credit, a non-credit 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, 721/821, 722/822, 801, 802) constitute 24 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: https://biostat.duke.edu/education/master-biostatistics/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 Kendall Mincey at kendall.mincey@duke.edu. The minimum requirements for admission to the Master of Biostatistics Program include:

- a bachelor's degree (or the equivalent to a U.S. 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; and (4) official Test of English as a Foreign Language (TOEFL) or International English Language Testing Service (IELTS) 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 at least two full years of academic study at a U.S. institution prior to their application to 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 director 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

The Master of Biostatistics Program follows the academic calendar of the Duke Graduate School. The academic calendar for 2018-2019 can be found at http://registrar.duke.edu/academic-calendar-2018-2019.

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 701L	Advanced Statistical Theory and Methods I Lab (2 course credits) Optional
BIOSTAT 702	Applied Biostatistics Methods I (3 course credits)
BIOSTAT 703	Introduction to the Practice of Biostatistics I (3 course credits)
BIOSTAT 703L	Introduction to the Practice of Biostatistics I Lab (0 credits)
BIOSTAT 704	Introduction to Statistical Theory and Methods II (3 course credits)
BIOSTAT 704L	Statistical Theory and Methods II Lab (2 course credits) Optional
BIOSTAT 705	Applied Biostatistical Methods II (3 course credits)
BIOSTAT 706	Introduction to the Practice of Biostatistics II (3 course credits)
BIOSTAT 721	Introduction to Statistical Programming I (2 course credits) [for students in the CTR and MS Tracks]
BIOSTAT 722	Introduction to Statistical Programming II (2 course credits) [for students in the CTR and MS Tracks]
BIOSTAT 801	Biostatistics Career Preparation and Development I (1 credit)
BIOSTAT 802	Biostatistics Career Preparation and Development II (1 credit)
BIOSTAT 821	Software Tools for Data Science (2 course credits) [for students in the BDS Track]
BIOSTAT 822	R for Data Science (2 course credits) [for students in the BDS Track]

Practicum

All candidates for the Master 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. Students receive two attempts to successfully pass the Qualifying Examination. The Qualifying Examination is offered twice each summer.

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)

Second-Year Courses

Full-time Master of Biostatistics students are required to select six elective courses during the second year of study, from among the courses listed below. The choice of second-year courses depends on the student's educational track (CTR vs. BDS vs. MS). Details on track-specific second-year course selections can be found at https://biostat.duke.edu/education/master-biostatistics/curriculum.

BIOSTAT 707	Statistical Methods for Learning and Discovery (2 course credits)
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)
BIOSTAT 823	Statistical Programming for Big Data (2 course credits) [for students in the BDS Track]
BIOSTAT 824	Case Studies in Biomedical Data Science (2 course credits) [for students in the BDS Track]
BIOSTAT 901	Modern Inferential Techniques and Theory (3 course credits) [for students in the MS Track]
BIOSTAT 905	Linear Models and Inference (3 course credits) [for students in the MS Track]
BIOSTAT 906	Statistical Inference (3 course credits) [for students in the MS Track]

With the approval of the director of graduate studies, students may enroll in courses from outside the Biostatistics and Bioinformatics department, but only two credits of one such approved course will count towards the 36 credits of graded course work required for graduation.

Professional Development Courses

BIOSTAT 801	Biostatistics Career Preparation and Development I
BIOSTAT 802	Biostatistics Career Preparation and Development II

Course Planning

There are three academic tracks available to students in the Master of Biostatistics program: (1) Clinical and Translational Research Track; (2) Biomedical Data Science Track; and (3) Mathematical Statistics Track. Students will automatically be enrolled in the Clinical and Translational Research Track. Students must apply to be enrolled in the other to two tracks after matriculating into the program. The course planning below is described for the Clinical and Translational track as this track is expected to be the most commonly selected track among students. Details on course planning for the all three tracks can be found at https://biostat.duke.edu/education/master-biostatistics/curriculum.

During the first year of study, full-time Master of Biostatistics students enrolled in the Clinical and Translation Research Track will typically take eight core courses:

Fall Semester		Spring Semester	
BIOSTAT 701	Introduction to Statistical Theory and Methods I (3 course credits)	BIOSTAT 704	Introduction to Statistical Theory and Methods II (3 course credits)
BIOSTAT 701L	Advanced Statistical Theory and Methods I Lab (2 course credits) Optional	BIOSTAT 704L	Statistical Theory and Methods II Lab (2 credits) Optional
BIOSTAT 702	Applied Biostatistical Methods I) (3 course credits)	BIOSTAT 705	Applied Biostatistical Methods II) (3 course credits)
BIOSTAT 703	Introduction to the Practice of Biostatistics I (3 course credits)	BIOSTAT 706	Introduction to the Practice of Biostatistics II (3 course credits)
BIOSTAT 703L	Introduction to the Practice of Biostatistics I Lab (0 credits)	BIOSTAT 722	Introduction to Statistical Programming II (2 course credits)
BIOSTAT 721	Introduction to Statistical Programming I (2 course credits)	BIOSTAT 802	Biostatistics Career Preparation and Development II (1 course credit)
BIOSTAT 801	Biostatistics Career Preparation and Development I (1 credit)		

During the second year of study, full-time Master of Biostatistics students enrolled in the Clinical and Translation Research Track take the following set of second-year courses and will receive credit toward the completion of the master's project. A typical sequence is as follows:

Fall Semester		Spring Semester	
BIOSTAT 713	Survival Analysis (2 course credits)	BIOSTAT 714	Categorical Data Analysis (2 course credits)
BIOSTAT 719	Generalized Linear Models (2 course credits)	BIOSTAT 718	Analysis of Correlated and Longitudinal Data (2 course credits)
BIOSTAT 720	Master's Project (3 course credits)	BIOSTAT 720	Master's Project (3 course credits)
	One Other Elective Course (2 course credits) • BIOSTAT 707 (Statistical Methods for Learning and Discovery) • BIOSTAT 708 (Clinical Trial Design and Analysis)		One Other Elective Course (2 course credits) • BIOSTAT 709 (Observational Studies) • BIOSTAT 710 (Statistical Genetics and Genetic Epidemiology)

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 director of graduate studies. Please note that courses taken outside the department must be approved by the director 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 director of graduate studies.

Grades

All courses will be graded on a five-letter grade scale (A,B,C,D,F) with +/- grades assigned at the course instructor's discretion. The only exceptions are BIOSTAT 720, 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 director 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 D or F or two grades of C or C- 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 director 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 director 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 practicum and the master's project as described in program guidelines. Students must also maintain a cumulative grade point average of 2.70 in order to maintain satisfactory academic progress.

For non-degree 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 two grades of C or lower or one grade of D+ or lower in any course(s) may be placed on academic probation at the discretion of the director 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 director 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 director of graduate studies provide 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 the director 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 the director 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 director 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 director 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;
- an updated curriculum vitae; and
- a transcript of any academic courses taken since the withdrawal.

The applicant will then be scheduled for an interview with the director of graduate studies. After this meeting takes place, the director 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 be retaking the course.

Policy on Appropriate Treatment of Learners - Master of Biostatistics Program

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 Duke SOM has adopted 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 in a school of medicine 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:

1. 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
2. Clearly communicating expectations, and applying consistent evaluation and grading methods which are communicated in advance of learner performance
3. Assigning tasks to learners based on their knowledge, skills and experience
4. Providing supervision and appropriate remediation when learners are not adequately prepared
5. Providing feedback to learners in a timely, constructive, personalized and explicit manner
6. Abiding by other policies of the SOM
7. 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:

1. 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")
2. 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, using a gender- or racially-charged epithet to refer to a learner)
3. Using threatening or obscene gestures, cartoons, or jokes in the presence of a learner
4. 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")
5. Ignoring learners assigned to you or failing to complete assigned learner evaluations
6. 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)
7. 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 though words, gestures, and behaviors (e.g. inviting on a date, commenting repeatedly on attractiveness or clothing, making sexually suggestive comments or gestures)
8. 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)
9. 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)
10. 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)
11. Endangering the learner's professional development (e.g. telling learners to ignore institutional or school policy, inviting learners to do something unethical or illegal)
12. 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)
13. 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
- to the Duke University Office of Institutional Equity

Investigation of Reports of Inappropriate Treatment of Learners

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. This body will serve 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 Director of the

Program, 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:

1. 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.
2. 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 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, behaviors that violate Title IX of the 1972 Education Amendments to the Higher Education Act, which include discrimination or harassment based on sex or gender, must be reported by any University official so that they can be promptly acted upon in order to be compliant with Federal Law. Behaviors that pose an immediate danger to others (e.g. violence or threats of physical violence, illegal drug use by students in the classroom setting, deliberate violation of patient safety procedures) or are illegal must also result in immediate reporting so that action can be taken.

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.

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

2018-2019

1st year tuition	$36,743
2nd year tuition	$36,743

Budget estimates of the full cost of attendance may be found on the Office of Financial Aid website at https://medschool.duke.edu/education/student-services/office-financial-aid/resources.

Health Insurance

All Duke students are required to have medical insurance—either through the Duke Student Medical Insurance plan or a comparable medical insurance plan based in the United States. For students holding an F-1 or J-1 visa, participation in the Duke SMIP is mandatory. 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: https://biostat.duke.edu/education/master-biostatistics/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 credits of coursework as outlined in this bulletin, 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 Duke Hub 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 701L: Introduction to Statistical Theory and Methods I Lab: Students enroll in BIOSTAT 701 may opt to enroll in this advanced lab designed to extend the material presented in BIOS 701. This course will be run as a mixture of lecture and recitation. Each session will start with a short presentation by the instructor of advanced examples that extend the material presented during that week's BIOS 701 lecture. Each session will conclude with students presenting their solutions to advanced problems assigned the prior week. At the end of the semester, students will take a cumulative exam covering the advanced topics covered during the lab session.
Corequisite(s): BIOSTAT 701
Credits: 2

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.
Corequisites(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 703L: Introduction to the Practice of Biostatistics I Lab: The lab will be an extension of the course. The lab will be run like a journal club. The lab will instruct students how to dissect a research article from a statistical and scientific perspective. The lab will also give students the opportunity to present on material covered in the co-requisite course and to practice the communication skills that are a core tenant of the program.
Corequisite(s): BIOSTAT 703 or permission of the Director of Graduate Studies
Credits: 0

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 704L: Introduction to Statistical Theory and Methods II Lab: Students who enroll in BIOSTAT 704 may opt to enroll in this advanced lab designed to extend the material presented in BIOSTAT 704. This course will be run as a mixture of lecture and recitation. Each session will start with a short presentation by the instructor of advanced examples that extend the material presented during that week's BIOSTAT 704 lecture. Each session will conclude with students presenting their solutions to advanced problems assigned the prior week. At the end of the semester, students will take a cumulative exam covering the advanced topics covered during the lab session
Corequisite(s): BIOSTAT 704
Credits: 2

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
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, 702, 704, 705, and 721 or 722 or their equivalents, or permission of the Director of Graduate Studies
Credits: 2

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, 702, 704, 705, and 721 or 722 or their equivalents, 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, 702, 704, 705, and 721 or 722 or their equivalents, 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 familiality 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, 702, 704, 705, and 721 or 722 or their equivalents, 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, 702, 704, 705, and 721 or 722 or their equivalents, 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, 702, 704, 705, and 721 or 722 or their equivalents, 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, 702, 704, 705, and 721 or 722 or their equivalents, 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, 702, 704, 705, and 721 or 722 or their equivalents, 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
Credits: 3 in Fall Semester and 3 in Spring Semester

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 732: Independent Study: Independent Study is a semester long course focused on mentored research in the practice of biostatistics. Students work with an assigned mentor. This course is only open to students by permission of the Director of Graduate Studies.
Credits: 1, 2, or 3

BIOSTAT 740: Continuation: Continuation is a semester-based, noncredit bearing enrollment status used when a student is continuing scholarly activities with the same mentor. This course is only open to students by permission of the Director of Graduate Studies.
Credits: 0

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
Credit: 1

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
Credit: 1

BIOSTAT 821: Software Tools for Data Science: A data scientist needs to master several different tools to obtain, process, analyze, visualize and interpret large biomedical data sets such as electronic health records, medical images, and genomic sequences. It is also critical that the data scientist masters the best practices associated with using these tools, so that the results are robust and reproducible. The course covers foundational tools that will allow students to assemble a data science toolkit, including the Unix shell, text editors, regular expressions, relational and NoSQL databases, and the Python programming language for data munging, visualization and machine learning. Best practices that students will learn include the Findable, Accessible, Interoperable and Reusable (FAIR) practices for data stewardship, as well as reproducible analysis with literate programming, version control and containerization.
Prerequisite: Permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 822: R for Data Science: This course will build on the foundation laid in software tools for data science. The course will explore the flow of a typical data science project from importing, cleaning, transforming and visualizing datasets to modeling and communicating results, within the context of R programming. While the course will include best practices, syntax and idioms specific to R, the focus will be on the process of conducting analysis in a reproducible fashion, writing readable, well-documented code and creating a coherent presentation of results.
Prerequisite: Permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 823: Statistical Program for Big Data: This course will extend the foundation laid in software tools for data science to allow for efficient computing involving very large data sets. This course will explore the use appropriate algorithms and data structures for intensive computations, improving computational performance by use of native code compilation, use of parallel computing to accelerate intensive computations, use appropriate algorithms and data structures for massive data set, and use of distributed computing to process massive data sets.
Prerequisite(s): BIOSTAT 821 or permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 824: Case Studies in Biomedical Data Science: This course will highlight how biomedical data science blends the field of biostatistics with the field of computer science through the introduction of 3 to 5 case studies. Students will be introduced to analytic programs typically encountered in biomedical data science and will implement the data science and statistical skills introduced in their previous course work.
Prerequisite(s): BIOSTAT 707, 821, 822, and 823 or permission of the Director of Graduate Studies
Credits: 2

BIOSTAT 901: Modern 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.
Prerequisite: Permission of the Director of Graduate Studies
Credits: 3

BIOSTAT 905. Linear Models and Inference: Introduction to linear models and linear inference from the coordinate-free viewpoint. Topics: identifiability and estimability, key properties of and results for finite-dimensional vector spaces, linear transformations, self-adjoint transformations, spectral theorem, properties and geometry of orthogonal projectors, Cochran's theorem, estimation and inference for normal models, distributional properties of quadratic forms, minimum variance linear unbiased estimation, Gauss-Markov theorem and estimation, calculus of differentials, analysis of variance and covariance.
Prerequisite(s): Biostatistics 702, 704, 705, real analysis, and linear algebra, or consent of the instructor and Director of Graduate Studies
Credits: 3

BIOSTAT 906. Statistical Inference: Introduce decision theory and optimality criteria, sufficiency, methods for point estimation, confidence interval and hypothesis testing methods and theory. Prerequisite: Biostatistics 704 or equivalent. Instructor consent required.
Prerequisite: Permission of the Director of Graduate Studies
Credits: 3

Master of Management in Clinical Informatics

Marcie Ellis

Department Chair: Elizabeth R. DeLong, PhD
Program Director: Kevin A. Schulman, MD, MBA
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 complete over the Summer term. The practicum provides students with a hands-on, real work project in which brings to bear the multidiscipline approach of the MMCi program.

The Master of Management in Clinical Informatics Program meets Friday and Saturday every other weekend. A remote option is available. Students participating remotely attend class one weekend a month; the other weekend is live via audio and video technology. Students interested in the program should contact MMCi Admissions, Duke University School of Medicine, DUMC 2734, Durham, NC 27710; email - mmci@duke.edu; website - mmci.duke.edu.

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
- three essays written by the applicant to assess readiness and interest
- GMAT or GRE is not required for application; education and experience are assessed. Admissions committee determines if required for admission.
- 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.

There is no application fee.

Academic Calendar

Dates for the Academic Terms

July 26-29	Boot Camp and Orientation
August 10-October 26	Fall Term 01
November 9-February 8	Fall Term 02
February 23-May 10	Fall Term 03
May 24-August 9	Fall Term 04
August 17, 2019	Graduation

Class Weekend Dates

August 10-11 and 24-25	November 9-10 and November 30-December 1	February 22-23 and March 8-9	May 24-25 and June 7-8
September 7-8 and 21-22	December 14-15 and January 4-5	March 22-23 and April 5-6	June 21-22 and July 5-6
October 5-6 and 19-20	January 18-19 and February 1-2	April 19-20 and May 3-4	July 19-20 and August 2-3
Exams: October 21-26	**Exams:** February 3-8	**Exams:** May 5-10	**Exams:** August 4-9

Financial Information

Tuition and Fees

MMCi Tuition (Note 1)	$59,600
Health Fee	$1,074
MMCi Events and Student Association	$450
Graduate Student Activity Fee	$37
Graduate Student Services Fee	$20
Recreational Fee	$287
Transcript Fee	$50
Total Tuition and Student Fees	**$61,518**
Books/Course Packs (estimated)	$1,600
Program Cost (without living expenses, insurance, and loan fees)	**$63,118**

Financial Aid

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 (FASFA). 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 https://medschool.duke.edu/education/student-services/office-financial-aid/resources.

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 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.

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 class on site or be accepted into the remote attendance option. Remote attendance requires students to participate live via audio and video technology for 11 of the 24 MMCi class weekends. Students in the remote participation option must attend class onsite for 13 of the 24 class weekends. A class weekend is defined as a full class day on a Friday and Saturday.

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. Failure to meet the Code of Professional conduct of the School of Medicine will be considered an academic violation and could lead to dismissal from the program and lead to grade of F in a course should the violation be associated with academic performance as required by each course.

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 DukeHub 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 meets four times throughout the year.

There are no elective courses, and no exemptions or substitutions are permitted.

Courses of Instruction

Management Courses

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 517–Applied Data Science. Practical Data Science in Healthcare. This course is designed to introduce students to the tools and technologies of "data science" as they are applied in healthcare. Bill Cleveland, the famous computer scientist wrote "Knowledge among computer scientists about how to think of and approach the analysis of data is limited, just as the knowledge of computing environments by statisticians is limited. A merger of the knowledge bases would produce a powerful force for innovation." Everything we do in delivering health to our patients involves information: how it is stored, how it is moved around, how we extract meaning from it. Understanding the many principles, technologic, ethical, and regulatory issues surrounding this "merger", is a requirement for leadership in the realm of

clinical informatics. Included in this course will be practical hands-on experience with plug and play machine learning tools via Microsoft Azure (no programming needed). 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 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

MMCI 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 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

Clinical Informatics Courses

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.

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. 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 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 assessed in this course is how can HIT technology be deployed to achieve its promise? This question is addressed from a strategic rather than technical perspective. Students develop exploratory frameworks to help analyze potential for impact of IT implementation efforts: scale economics, network economics, and organizational innovation. Students assess the adoption of technology within existing organizations as well as barriers to adoption. Additionally, there is exploration of the development of killer apps — how are health IT firms financed and what are successful business models and concepts. Overall, students 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 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. Students 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. Students 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

Jared Lazarus

Master of Health Sciences Degree Programs

Marcie Ellis

The Clinical Leadership Program

The Master of Health Sciences in Clinical Leadership (MHS-CL) Program provides clinicians and other health care professionals with the training necessary to be adept and versatile leaders who can address the complexities of today's changing health care environment with innovative solutions. The MHS-CL, which was developed by the School of Medicine's Department of Community and Family Medicine, Fuqua School of Business, Duke Law School, the Sanford School of Public Policy, and School of Nursing, provides a comprehensive interdisciplinary core curriculum that challenges participants to view health care issues from the perspective of business, finance, informatics, law, policy, population health, quality management, and strategic planning.

Department of Community and Family Medicine

Chairman: Anthony J. Viera, MD, MPH

Program Director: Anh N. Tran, PhD, MPH

Clinical Leadership Program Advisory Committee: Kyle Cavanaugh, MBA; Mary T. Champagne, PhD, RN; William Kane, MD; Michelle J. Lyn, MBA, MHA; J. Lloyd; Michener, MD; Barak D. Richman, JD, PhD; Diane M. Uzarski, DNP, MPH, RN; Duncan Yaggy, PhD

Program Website: http://clinical-leadership.mc.duke.edu

Academic Calendar*

Distance Class Schedule

Fall 2018	August 20, 2018-November 19, 2018
Spring 2019	January 9, 2019-April 12, 2019
Summer 2019	May 8, 2019-August 8, 2019

On-Campus Class Schedule

Fall 2018	August 20, 2018-August 22, 2018
Spring 2019	January 9, 2019-January 11, 2019
Summer 2019	May 8, 2019-May 10, 2019

*All dates are subject to change

Prerequisites for Admission

The prerequisites for admission to the MHS in Clinical Leadership curriculum include:

A baccalaureate degree (or the equivalent) in a health care or public health discipline from an accredited institution. Many individuals have advanced degrees such as, but not limited to, DO, NP, MD, PA, and PT.

Admissions Procedures

Applicants seeking admission either as a degree candidate or as a nondegree participant should submit the application form and supporting documents. Applicants residing outside the United States must consult the Duke Visa Services Office about visiting the United States as a Duke student before applying.

All persons taking courses in the Master of Health Sciences in Clinical Leadership Program must be formally admitted to the program. Admission decisions are based upon a candidate's academic qualifications combined with their professional experience. The Admissions Committee reviews completed applications three times per year. Contact the program office for information on application submission deadlines.

Application for Admission–Degree Candidates

The completed application and letters of evaluation and transcripts (sent directly to the program from the evaluator or issuing institution) may be emailed to ClinicalLeadership@mc.duke.edu or faxed to (919) 613-6899, Attn: Clinical Leadership Program, Division of Community Health. The $100 application fee should be sent to:

Clinical Leadership Program
Department of Community and Family Medicine
DUMC Box 104425
Durham, NC 27710

Materials submitted in support of an application will not be released for other purposes and cannot be returned to the applicant.

The Degree Student Application for Admission and other document forms can be downloaded from the program website, http://clinical-leadership.mc.duke.edu.

Transcripts

- An official transcript from each post-secondary institution attended should be sent directly to the Clinical Leadership Program by the institution. Personal or unofficial copies cannot be accepted. The requirement to provide transcripts is waived for applicants currently enrolled in another Duke University educational program.

Letters of Evaluation

- Three letters of evaluation are required as part of the application's supporting documents. They are the General Letter of Evaluation, the Administrative Experience Letter of Evaluation and the Clinical Experience Letter of Evaluation. These letters should speak to the general, clinical and administrative experiences of the applicant.
- All letters are to be written by people who are qualified to testify to the candidate's capacity for graduate work and preferably not all letters are from the same organization.
- Evaluation letter forms can be downloaded at the program website. These should be completed by each evaluator and emailed or faxed directly to the Program.

Test Scores

- **The Graduate Record Examination (GRE) General (Aptitude) Test.** The GRE will be waived for applicants who have an undergraduate cumulative grade point average of 3.25 or higher. Applicants with a conferred graduate or professional advanced degree (certificates do not qualify) at the time of the application deadline are also exempt from the GRE requirement. Scores submitted must be no more than five years old. Scores must be sent to the Duke University Master of Health Sciences in Clinical Leadership Program from the Educational Testing Service.
- **Test of English as a Foreign Language (TOEFL).** Applicants whose first language is not English and who do not hold a bachelors or higher degree from an English speaking Institution must submit scores from the Test of English as a Foreign Language (TOEFL). Test scores must not be more than two years old and an official copy must be sent to Duke University.

Licensure

- Candidates must present proof of current practice licensure (if applicable to profession).

Admissions Interview

- Applicant finalists will be required to complete an admissions interview.

Application for Admission–Nondegree Students

Program enrollment in MHS-CL courses for nondegree students is available to qualified individuals who want to acquire specific knowledge or skills but who do not want to pursue the master's degree. This group of individuals may include health professionals, faculty members, post-doctoral fellows or graduate students. For each course, a limited number of nondegree students are allowed to enroll. Nondegree program applicants must have a baccalaureate degree (or equivalent) from an accredited institution, unless otherwise given approval by the program director to enroll.

Applicants seeking admission must submit the Nondegree Student application, post-secondary education transcripts and provide one Letter of Evaluation. The Letter of Evaluation should be written by someone qualified to testify to the candidate's capacity for graduate work. All program applications and forms can be downloaded from the program website: http://clinical-leadership.mc.duke.edu/. The completed application, and letter of evaluation (sent directly from the evaluator) and transcripts (unofficial copies are accepted for nondegree applicants), may be emailed to ClinicalLeadership@mc.duke.edu or faxed to (919) 613-6899, Attn: Clinical Leadership Program, Division of Community Health.

Clinical Leadership Program courses taken for nondegree credit can be transferred to apply towards the master's degree program requirements as long as: 1) the course is still being offered in the program; 2) the course was taken within the past 3 years; 3) the grade received for the course is Pass or higher; and 4) the total number of course credits to be applied towards the master's degree program does not exceed one third of the total number of MHS-CL program course credits required.

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.

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, three-year professional degree program awarded by the Duke University School of Medicine allows participants to continue practicing in their profession while attending courses in onsite sessions on the Duke University campus combined with distance-based technology-supported learning. Students are enrolled for 5-8 course credits, on average, during the fall, spring and summer semesters. Throughout the program, Master's Program students participate in a targeted leadership coaching component intended to enhance a specific skill set or emotional intelligence competency, as determined by the student and executive leadership coach. Master's Program students also complete a longitudinal policy project for an actual client, experience seminars that give students the opportunity to explore topics in more depth outside the classroom setting and engage in personalized executive coaching sessions focused on the student's leadership development and enhancement objectives. These experiences all 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.

Attendance and Excused Absences

Master's Degree Students: Students are required to attend in person the scheduled on campus sessions for three days at the beginning of the first academic term of each year of the program. The instruction for the remaining two academic terms of each program year will be provided via distance-based education platform.

Nondegree Students: Students local to the area are required to attend in person the scheduled on campus sessions for three days at the beginning of each semester. Students who are based out of the local area have the option to participate via distance-based technology.

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.

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. A request must be submitted in writing by the student to the program director no later than thirty days prior to the expiration of the one year time limit in order to be considered for an extension of the one year limit. Based on each individual student's circumstance, the program director has the discretion to grant or deny an extension.

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:	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.

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 s/he was enrolled for the term and that s/he 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;
  - 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 then will 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

Students enrolled in the Clinical Leadership Program are expected to adhere to the Duke University School of Medicine Code of Professional Conduct, found elsewhere in this bulletin.

Program Statement of Professionalism

1. Commitment to Learning
   - Actively seeks learning opportunities 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; meets 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 2018-2019 academic year:

1. Degree program courses. $1435 per credit unit.
2. Nondegree program courses. $1435 per credit unit.

Duke employees may be eligible for the University's Employee Tuition Assistance Program (https://hr.duke.edu/benefits/educational/employee-tuition-assistance/) and other sources of support may exist in clinical departments. Prospective applicants should consult with their program directors and division chiefs regarding other 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, email, 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 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 camera equipped computer and headset with microphone are required 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, and Safari) are required for access to Sakai, Duke University's online learning management system, and WebEx, the conferencing system used to facilitate live class sessions.

Financial Aid

Qualified students may be eligible for 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 Health Sciences in Clinical Leadership is a professional degree awarded by the Duke University School of Medicine. The three-year degree program requires completion of 42 course credits as follows: 26 course credits of graded coursework; five seminars for which 10 course credits are earned; and a team project for which 6 course credits are earned.

Commencement Information

Graduation exercises are held once a year in May when degrees are conferred, and diplomas are 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. September and December diplomas are mailed within 30 days of the graduation date, as diplomas are issued after approval by the Academic Council and the Board of Trustees.

Since university graduation ceremonies are held only at the end of the spring term, graduates with a degree date of September or December 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. Willis

CLP-201. Management Leadership and Team Development. The course focuses on leading and managing within complex health care 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 health care setting. Discussion will focus on adaptive, non-traditional managing techniques. Credit: 2. Willis

CLP-202. Ethical Issues in Leadership. This course is a framework for examining ethical dilemmas and challenges that clinical leaders encounter. Through the exploration of ethics theory, principles of ethical leadership and the use of case studies, students will deliberate and comment on the character and conduct of individuals in hypothetical scenarios. Students will examine their value judgments in peer group discussions. Credit: 2. TBA

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. This course is intended to expose students to strategies to delineate personal vision, mission and values statements; determine and achieve career goals; explore existing beliefs and self-management strategies, and seek ways to improve personal strengths and mitigate weaknesses. Credit: 2. Willis

CLP-204. Leading in a Chaotic Environment. Students will meet with industry leaders to learn perspectives on crisis management in turbulent and complex environments. Students will learn how to anticipate and plan for crises by analyzing examples of successful crisis management. Leadership theory and practice will be explored as students examine leadership styles, including their own, and learn to make shifts that help an organization endure and innovate in a changing health care environment. Credit: 2. Willis

CLP-205. Clinical Leadership Project. The goal of the Clinical Leadership Project is to help a real client address a problem in health policy, financial planning, or administration. Its aim is to recommend and defend a specific course of action. Students work as part of a team to complete the project, which is divided into two parts. The first semester (CLP 205a) is devoted to client and problem identification, and to developing and defending a written prospectus. The second semester (CLP 205b) is devoted to the completion and final defense of the project. Credit: 3, 3. Kane, Yaggy

CLP-206. Quality Measurement and Improvement for Clinical Leaders. This course covers the current status of health and health care quality in the U.S.; a review of quality improvement models, tools, metrics, and techniques; applications of Q.I. metrics for provider profiling, patient safety, payment, accreditation, and health care transformation; and key skills needed to implement changes. Leadership models/concepts will be referenced as they relate to quality improvement. Credit: 3. Bradley

CLP-207. Contemporary Human Capital Management. Human capital has been identified as the primary driver across successful organizations. This course will review the core components of human capital management, including workforce planning, total compensation, workforce development, and overall engagement. Throughout the course, relevant employment related legislation and laws will be explored and discussed. Special attention will be given to emerging and contemporary practices, including global human resource initiatives. Credit: 3. Cavanaugh

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 Health Care Finance. This course provides a background in health care 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. The 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. TBA

CLP 214. Population Health Management Approaches. This course provides health care professionals with the tools needed for effective population health management and care coordination. The course uses a project incubator framework to allow students to bring an existing population health project or ideas that they would like to develop with guidance from subject matter experts. Students will learn from one another's experiences, and will receive individual consultation time with faculty. Credit: 3. Lyn, Johnson

CLP 215. Health Care Operations: Perspectives for Continuous Improvement. Students will develop a toolkit for continuous improvement within health care organizations and systems and will 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, LinkedIn, 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 core faculty from the Department of Biostatistics and Bioinformatics, and other departments within the School 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 2018

Monday, July 9	Fall course registration begins
Monday, August 27	First day of class. New student orientation
Monday, September 3	Labor Day Holiday. No class
Friday, September 14	Drop/Add ends
Monday, November 12	Registration begins for Spring Semester 2019
Tuesday, November 20	Thanksgiving recess begins
Monday, November 26	Classes Resume
Thursday, December 13	Last day of class

Spring 2019

Monday, January 7	Spring Semester begins. First day of Drop/Add
Monday, January 21	Martin Luther King, Jr. Day. No class
Friday, January 25	Drop/Add ends
Monday April 22	Last day of class
Sunday, May 12	Graduation exercises; conferring of degrees

Admission

Applicants may apply to the program as degree candidates, as certificate candidates or as non-degree students. An advanced degree in a clinical health science from an accredited institution is a prerequisite for admission. 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.

Degree

The Duke University School of Medicine awards a degree of Master of Health Sciences in Clinical Research to students who successfully meet program requirements.

Applicants seeking admission as a degree candidate must submit the online application form and the following documents:

- **CV.** A current curriculum vitae (CV).
- **Transcripts.** An official transcript from each graduate school, including medical school transcripts, must be sent to Duke University's Clinical Research Training Program directly by the institution. Personal copies of your records are not acceptable.
- **Letter of Recommendation.** A letter of recommendation is required. It should be written by someone qualified to testify to your capacity for graduate work. The form may be downloaded from the online application; it should be emailed to Duke University's Clinical Research Training Program directly by the evaluators.
- **Test of English as a Foreign Language (TOEFL).** CRTP requires that any applicant whose first language is not English and does not hold a bachelors or higher degree from an English-speaking institution must submit scores from the Test of English as a Foreign Language (TOEFL). Test scores must not 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 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, and Refugees. The Clinical Research Training Program will provide additional information regarding this documentation with letters of acceptance to the program.

Certificate (Academic Core in Clinical Research Certificate)

The certificate option leads to the Academic Core in Clinical Research awarded by the Duke University School of Medicine. Applicants must successfully complete the five (5) required core courses which constitute the foundation of the full degree program (CRP 241, 242, 245, 253 and 254). Students who complete the certificate may convert their status to degree seeking and apply completed coursework toward degree requirements.

Applicants seeking admission as a degree candidate must submit the online application form and the following documents:

- **CV.** A current curriculum vitae (CV).
- **Transcripts.** An official transcript from each graduate school, including medical school transcripts, must be sent to Duke University's Clinical Research Training Program directly by the institution. Personal copies of your records are not acceptable.
- **Test of English as a Foreign Language (TOEFL).** CRTP requires that any applicant whose first language is not English and does not hold a bachelors or higher degree from an English speaking Institution must submit scores from the Test of English as a Foreign Language (TOEFL). Test scores must not 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 accredit university where English is the verified SOLE language of instruction, are exempt from submitting English language proficiency results.

Nondegree

The courses in the program are also available to qualified individuals who want to acquire specific skills but who may not want to pursue the master's degree. In addition to clinical fellows, such individuals include faculty members, post-doctoral fellows, and other health professionals. This option allows the flexibility of taking various combinations of courses subject only to constraints imposed by course prerequisites.

Nondegree applicants must submit the online application form and satisfy TOEFL requirements as outlined above under the degree option.

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 (email 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. (see "Withdrawal from a Course" and "Withdrawal from Program").

Grades

Courses within the Clinical Research Grading Program utilize a Pass/Fail grading scale. 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 Incomplete in a prerequisite course. A grade of Incomplete 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 Incomplete converts to a Fail and becomes permanent.

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 nondegree 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–(Dismissal) Policy

For degree candidates, receiving a single final course grade of fail (F) will typically trigger an academic review by the Program Director. If a degree candidate receives two final course grades of F, the Program Director will convene a faculty review committee consisting of the Program Director and at least two other faculty members. The student will be invited to attend part of the meeting if desired – for example, to present additional information – but is not required to attend. The committee's recommendation will then be reviewed by the Program Director. What happens next depends on the nature of the recommendation. If the recommendation is for dismissal, it will be reviewed by the Vice Dean of Medical Education as per the School of Medicine review procedures. The Vice Dean of Medical Education makes the final decision and communicates that decision to the student. Any appeals of that decision follow the policies of the School of Medicine. On the other hand, if the decision does not involve dismissal, it will be conveyed to the student by the Program Director.

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. In exceptional circumstances the designated period may be extended with the written approval of the Program Director. 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 meeting takes 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.

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 2018-2019 academic year is $811 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 DukeHub 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 statistical 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. This course is offered in even-numbered years only. Prerequisite: None. 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: None. 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-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. Prerequisites: CRP 241 and CRP 242. 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-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 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 Chairman, Department of Pathology: Jiaoti Huang, MD, PhD
Director, Pathologists' Assistant Program: Rex Bentley, MD
Associate Director and Education Coordinator, Pathologists' Assistant Program: Pamela Vollmer, BHS, PA (ASCP)
Medical Director, Pathologists' Assistant Program: Diana Cardona, MD
Director, Surgical Pathology: Rex Bentley, MD
Surgical Pathology Training Coordinator: Melissa Vazquez, MHS, PA (ASCP)
Director, Autopsy Pathology: Christine Hulette, 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
Director of Surgical Pathology, Veterans Affairs Medical Center: Robin Vollmer, MD

Pathologists' Assistant Program Academic Calendar

(Master of Health Sciences and Certificate)

First Year

August 6-January 31	Fall Semester 2018
November 21-25	Thanksgiving Break
December 15, 2018-January 1, 2019	Holiday Break
February 1-June 28	Spring Semester 2019
March 23-31	Spring Break
June 29-July 7	Summer Break
July 8-August 30	Summer Semester 2019

Second Year

September 10-December 14	Fall 2018
November 17-25	Thanksgiving Break
December 15, 2018-January 1, 2019	Holiday Break
January 2-May 10	Spring Semester 2019
March 23-31	Spring Break
May 13-July 18	Summer Semester 2019

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, college mathematics to the level of algebra, and English composition.
   -or-
   A baccalaureate degree in a non-science major to include the courses defined above 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. Suggested prerequisites include cell and molecular biology, human physiology, immunology, genetics, microbiology, gross anatomy and microscopic anatomy.

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), or surgical pathology work experience is required. Autopsy shadowing is also preferred, but not mandatory.
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

Year 1 Fall	Course Credits
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 302 (Forensic Pathology), PATHASST 340-341 (Photography 1-2), 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 probation; 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 may be 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.

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

2018-2019

1st year	$32,679
2nd year	$32,629

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. 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 pathologists' 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, Velkey, and staff

CELLBIO-701. Human Structure and Function. Human Structure and Function integrates the disciplines of physiology, microscopic anatomy, gross anatomy, and embryology and is conducted through the medical school course ID101B Normal Body. This is an organ-

systems based course covering the normal structure, function, and development of the human body. The students learn to recognize and explain the basic concepts and principles that apply to each organ and organ system and their integration to maintain homeostasis, as well as some clinical aspects of failure of these systems. The organ systems covered include: skin, cardiovascular, respiratory, lymphatic, gastrointestinal tract and glands, urinary, endocrine, male and female reproductive, musculoskeletal, and peripheral nervous system. The organ-based curriculum is keyed in part to the cadaveric dissections dividing the course content into four units: thorax, abdominal and pelvic activity, musculoskeletal and head and neck. Learning methodologies are highly interactive, as students participate in laboratories, symposia, problem sets, and team based exercises. These group exercises require the application of newly mastered basic science principles to clinical scenarios to facilitate integration of the course content and to foster clinical reasoning. Registration of non-Pathologists' Assistant students requires permission of Course Director. Credit: 12. Jakoi

PATHASST-102. 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 team-based exercises, a variety of small group activities guided by faculty, clinically-oriented disease workshops, team-based case discussions, and updated lectures. Credit: 20. Nadler, Alspaugh, Gunn, Deyrup, 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, and staff

PATHASST-210. Introduction to Autopsy Pathology. This is a summer rotation given during the first summer session. It is designed to reacquaint 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. Hulette, Hennessey, Riley 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. Su

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 reacquaint 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. Vazquez 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. Vazquez, 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. Hulette, Hennessey, Riley 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. Vazquez, 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 prosections in all possible situations, and write full preliminary autopsy reports. In addition, special dissection skills are taught in this course. Credit: 3. Hulette, Hennessey, Riley 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. Vazquez, 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 faculty and staff.

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: Anthony Viera, MD, MPH
PA Division Chief: Patricia M. Dieter, MPA, PA-C
Program Director: Jacqueline S. Barnett, DHSc, MSHS, PA-C
Medical Director: Margaret Gradison, MD, MHS-CL
Director Preclinical Education: Annamarie Streilein, MHS, PA-C
Academic Coordinator: Betsy Q. Melcher, MS, ATC, MHS, PA-C
Clinical Coordinator: Melinda Blazer, MHS, PA-C
Clinical Coordinator: Nicholas M. Hudak, MSEd, MPA, NCC, PA-C
Director Clinical Education: April Stouder, MHS, PA-C
Director of Curriculum: Peggy R. Robinson, MS, MHS., PA-C
Director of Diversity and Inclusion: Lovest T. Alexander, MHS, PA-C
Director of Research: Perri Morgan, PhD, PA-C
Director of Assessment and Evaluation: Susan T. Hibbard, PhD
Associate Professor: Christine Everett, PhD, MPH, PA-C
Academic Coordinator: Lorraine Anglin, MHS, PA-C
Medical Instructor: Quincy Jones, MSW, MHS, PA-C
Assistant Professor: Mara Sanchez, MMS, PA-C
Surgical Coordinator: Kim Howard, MHS, PA-C
Pharmacology Coordinator: Jean Mesaros, PharmD
Anatomy Coordinator: Megan Holmes, PhD
Associate Consulting Professor: Victoria Scott, MHS, PA-C
Professor Emeritus: Justine Strand de Oliveira, DrPH, PA-C
Senior Education Specialist: Sandro Pinheiro de Oliveira, PhD, MA, MRE

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.

Of the approximate 115,000 certified PAs in the United States, 28 percent provide primary care services, especially in family and general internal medicine. While PAs practice medicine with physician supervision, 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 clinical setting and to the collaborative practice between the PA and the 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 demonstrated the value of having PAs as part of the team and 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 2018-2019 (Class of 2020)

Fall 2018

August 6	Monday, 9 a.m.—Orientation Week (8/6-8/10) begins
August 13	Monday—Fall Semester classes begin
August 22	Wednesday, 4 p.m.—Convocation
September 3	Monday—Labor Day Holiday, no classes
October 10	Wednesday, 5 p.m.—Begin Fall Break
October 15	Monday, 8 a.m.—Classes resume
November 20	Tuesday, 5 p.m.—Begin Thanksgiving Holiday
November 26	Monday, 8 a.m.—Classes resume
December 14	Friday, 5 p.m.—End of Fall Semester; Winter Break begins

Spring 2019

January 2	Wednesday, 8 a.m.—Spring Semester classes begin
January 21	Monday—Martin Luther King, Jr. Holiday—no classes
February 8	Friday, 5 p.m.—Begin Spring Break
February 18	Monday, 8 a.m.—Classes resume
April 10	Wednesday, 5 p.m.—End of Spring Semester; Semester Break begins

Summer 2019

April 15	Monday, 8 a.m.—Summer Term classes begin
May 17	Friday, 5 p.m.—End classes for AAPA Conference
May 27	Monday—Memorial Day Holiday, no classes
May 28	Tuesday, 8 a.m.—Classes resume
June 21	Friday, 5 p.m.—End of Summer Term and Preclinical Year
June 22	Friday—End of classes

Clinical Year Calendar – Academic Year 2018-2019 (Class of 2019)

June 23-July 8	Summer Break
July 9-20	Physician Assistant Program 299 Bridge: The Path to Patient Care
July 23-August 17	Rotation #1
August 20-September 14	Rotation #2
September 3	Labor Day Holiday
September 17-October 12	Rotation #3
October 11 & 12	Call Back Days
October 13-21	Fall Break
October 22-November 16	Rotation #4
November 19-December 14	Rotation #5
November 22	Thanksgiving Holiday
December 14	Call Back Day
December 15, 2018-January 1, 2019	Winter Break

January 2-25	Rotation #6
January 21	Martin Luther King, Jr. Holiday
January 28-February 22	Rotation #7
February 21 & 22	Call Back Days
February 25-March 22	Rotation #8
March 25-April 19	Rotation #9
April 18 & 19	Call Back Days
April 20-28	Spring Break Optional PHYSASST 309
April 29-May 24	Rotation #10
Sunday, May 12	Graduation
Friday, May 10 at 5 p.m.-May 12	PA Holiday
May 27	Memorial Day Holiday
May 28-June 21	Rotation #11
June 21	Call Back Day
June 24-July 19	Rotation #12
July 4	Independence Day Holiday
July 22-August 2	Senior Seminar
August 2	Certificate of Completion
August 9, 2019	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 pa.duke.edu. The application is available from April 26 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; ninety 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 check and drug screening following admission 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. Opportunities for early clinical exposures are an important part of the first-year curriculum, and these patient learning experiences are incorporated into the Patient Assessment and Counseling courses during the fall, spring and summer semesters 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 core clinical courses in internal medicine, surgery, emergency medicine, primary care, pediatrics, women's health, and behavioral medicine. In addition, two elective clinical courses are included in the clinical year schedule, as is a clinical course devoted to advanced study in evidence-based practice. At least one clinical experience 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 at least two of their clinical experiences. Housing will be made available for out-of-town clinical course experiences.

Curriculum

Before proceeding into the clinical phase of the curriculum, students must satisfactorily complete the following:

Preclinical Year

Fall Semester	Course Credits
PHYASST 200 (Basic Medical Sciences)	2
PHYASST 201 (Physiology)	2
PHYASST 205 (Anatomy)	4
PHYASST 210 (Diagnostic Methods I)	3
PHYASST 220 (Clinical Medicine I)	5
PHYASST 223 (Pharmacology and Therapeutics I)	1
PHYASST 231 (Patient Assessment and Counseling I)	3
PHYASST 255 (Evidence-Based Practice I)	2
Term Total	**22**

Spring Semester	
PHYASST 203 (Introduction to Prevention & Population Health)	1
PHYASST 211 (Diagnostic Methods II)	2
PHYASST 221 (Clinical Medicine II)	10
PHYASST 224 (Pharmacology and Therapeutics II)	1
PHYASST 230 (Fundamentals of Surgery)	3
PHYASST 232 (Patient Assessment and Counseling II)	3
PHYASST 251 (Practice and the Health System I)	1
Term Total	**21**
Summer Term	
PHYASST 212 (Diagnostic Methods III)	1
PHYASST 222 (Clinical Medicine III)	10
PHYASST 225 (Pharmacology and Therapeutics III)	1
PHYASST 233 (Patient Assessment and Counseling III)	3
Term Total	**15**
Preclinical Year Total	**58**

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
PHYASST 300A, 300B (Primary Care I & II)	4 4
PHYASST 305 (Evidence-Based Practice II)	3
PHYASST 310 (Behavioral Medicine)	4
PHYASST 320A, 320B (Internal Medicine I & II)	4 4
PHYASST 340 (General Surgery)	4
PHYASST 350 (Emergency Medicine)	4
PHYASST 360 (Pediatrics)	4
PHYASST 370 (Women's Health)	4
Elective	4
Elective	4
PHYASST 390 (Senior Seminar)	2
Total	**51**

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 the summative evaluation to graduate from the PA Program.

Attendance

Our program's philosophy is that all coursework is significant and that student presence at all sessions is important. Many students bring to our program previous expertise in a given field. Students with strong background knowledge of a particular subject should understand that there is always more that can be learned, or shared. Assuming that one has nothing to learn from a particular class is a dangerous presumption in a profession that requires lifelong learning. Students are expected to attend all lectures, laboratories, and small group sessions, as they are designed to develop professional and clinical skills. Courses with practicums, laboratory sessions 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 these learning activities, attendance is required. In the event of illness or emergency, students should notify the course coordinator and their advisor in advance of a missed PAC1 practicum, laboratory session, CPL, Synthesis Session, or standardized patient encounter or any required activity.

A pattern of recurrent absences may have a negative impact on the clinical competency of the learner and reflect poorly on the learner's professionalism. Significant attendance concerns which may be jeopardizing the student's academic standing will be brought to the student's attention by faculty. For students on a behavioral or learning contract where attendance is a required component of the contract, recurrent absences violate the terms of the contract and may result in recommendation for probation, suspension, or dismissal from the program.

Attendance policies in the clinical year of the curriculum are established to assure competency in each area of medicine. Clinical year policies are clearly outlined prior to beginning clinical rotations and do vary from the preclinical attendance policy outlined above.

Registration and Drop/Add Policy

All courses are required and are offered as a cohort. In the pre-clinical year. With the exception of the optional medical Spanish course, there is no opportunity to drop or add a course. In the clinical year, all students will register for the bridge course and senior seminar, and will complete these courses together as a class. Students also register for the required core clinical courses and two of the elective course offerings, however, they will complete these courses at different times during the clinical year. Faculty assign all clinical year courses, and therefore courses can only be dropped or added at the discretion of the program faculty.

Program Policies and Grading Standards

Grades for all pre-clinical and clinical courses 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 being placed on a learning and/or a behavioral contract, probation, suspension, or dismissal from the program.

Appeals of Course Grades

A student may appeal a course grade by writing to the Program Director within 2 weeks of the grade being posted, 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 the Bridge course, all required core clinical courses, elective courses, and senior seminar (a total of 51 course credits) during the fall, spring, and summer terms; clinical courses 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 clinical course cycle into the next calendar or academic year, delaying the intended/expected time of 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 Promotion Committee, and each student is assigned to one of the following categories of academic standing:

A. **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).

B. **Academic Probation:** The PA student is considered to be on academic probation if s/he 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 a combined unit exam), or as recommended by the Progress & 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 in a semester with an overall grade of less than 78, the student will 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.

Students on academic probation or a behavioral contract may be ineligible for special clinical experiences such as Global Health Electives, some scholarship opportunities, 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 permanently noted on the student's transcript at the completion of the semester(s) during which this status is assigned. 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. The student's appeal to the AAC should be directed in the form of a letter to the Vice Dean of Education, School of Medicine. 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 (LOA) for personal, medical or academic reasons for a period not to exceed 12 months. The student must make an appointment with the Financial Aid Office to discuss the potential impact of the LOA on their financial aid package and any additional fees associated with an off-cycle program completion. Students must reach out to Student Health Administration to discuss the impact of a LOA on student health insurance coverage.

If the leave of absence is approved, the Program Director provides written notification including applicable beginning and ending dates to the student, the 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 two weeks prior to the anticipated date of re-entry. A student desiring an extension beyond 12 months 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. Students requesting a medical leave of absence may be required to provide documentation from a healthcare provider that they are fit/medically cleared to return to the PA program and can meet the program required technical standards for PA students. In all cases of a leave of absence, the student is required to complete the full PA curriculum to be eligible to earn the master's degree and PA certificate.

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 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 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. The policy can be viewed at https://medschool.duke.edu/sites/default/files/field/attachments/Social%20Media%20Policy.pdf. Professionalism is an academic issue and failure to demonstrate prescribed professional standards may jeopardize

advancement and graduation. Comparable to 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 socioeconomic 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/jfe/form/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, examinations, and clinical rotation performance.

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 its 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 situations 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 Fees[1]

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.

2018-2019

Class of 2018 Yearly Tuition	$40,823
Class of 2019 Yearly Tuition	$41,844

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/resources.

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.

Student Sexual Misconduct Policy

Duke University policies and the federal Title IX law make it clear that violence and harassment based on sex and gender are prohibited to the same extent as violence and harassment based on other protected categories such as race, national origin, disability, etc. The Office of Gender Violence Protection and Intervention in the Women's Center ((919) 684-3897, wchelp@duke.edu, https://studentaffairs.duke.edu/wc), the Office of Student Conduct ((919) 684-6938, conduct@duke.edu, https://studentaffairs.duke.edu/conduct), and/or the Office for Institutional Equity ((919) 684-8222, https://oie.duke.edu/) all are resources for information and reporting.

Further, Duke conducts extensive education and awareness programs with the goal of preventing and discouraging sexual violence and other forms of Sexual Misconduct.

Please see the following link for the full University policy: https://studentaffairs.duke.edu/conduct/z-policies/student-sexual-misconduct-policy-dukes-commitment-title-ix.

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.

1 Subject to change and Board approval

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, https://medschool.duke.edu/education/student-services/office-financial-aid/resources. Additional information can be obtained by calling (919) 684-6649, by contacting the Office of Financial Aid, Box 3067, Duke University School of Medicine, Durham, NC 27710 or by emailing finaid@dm.duke.edu.

Student Employment

Due to the rigors of the curriculum, the majority of students find it difficult or impossible to work. Working while in the program may jeopardize student's academic standing. In efforts to promote satisfactory academic progression, the program strongly discourages students from working.

Student employment may jeopardize one's ability to remain in satisfactory academic standing and to successfully complete the program. 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. Any student working while attending the program should notify his/her advisor.

PA students are prohibited from working for the PA Program as instructional faculty or staff. While PA students often support each other throughout their PA education, this support does not substitute for instructional faculty or administrative staff. The program and the university have adequate faculty and staff to support students throughout their training.

Although students may assist preceptors and administrative staff with various duties to promote ongoing clinic work flow (organizing files, requesting labs, calling patients, etc.), students do not substitute for clinical or administrative staff during supervised clinical rotations.

Commencement

To fulfill the requirements of the MHS degree, the physician assistant student must successfully complete 93 course credits including all preclinical courses, and all clinical courses scheduled prior to the May commencement date. The PA program certificate of completion and the actual hard copy of the MHS degree is awarded four months later, following the student's completion of a total of 109 credits, the remaining clinical courses, and the senior seminar.

PA students should be aware that failure to begin or complete a clinical course as scheduled could delay receipt of both the MHS degree and the PA program's certificate of completion. Furthermore, incomplete clinical courses 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 - Required

PHYASST-200. Basic Medical Sciences. The basic facts, concepts, and principles which are essential in understanding the fundamental mechanisms of genetics, nutrition, immunology, pathology, microbiology and infectious disease. 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. Anglin

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 is taught in conjunction with Practice and the Health System. It uses a team-based learning approach to develop appreciation of population characteristics that impact health and potential PA approaches to improving the health of populations. Student teams meet in lecture and small group settings for topic discussion. Web-based sessions are also utilized. A final team project is required. Credit: 1. Everett.

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 dissections, 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. Anglin

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. Staff

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 I, II, III (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. Howard

PHYASST-231, 232, 233. Patient Assessment and Counseling I, II, III. 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. Sanchez

PHYASST-251. Practice and the Health System. This course provides an overview of the American health care system with a focus on the PA profession. It provides a system perspective on issues discussed in Prevention and Population Health. An interdisciplinary faculty will provide lectures and lead conversations on various aspects of health care, including such topics such as: the history of the PA profession, financing cost control and reimbursement, legislation and regulation, political issues, quality of care and professional organizations. The first part of the course will focus on US Health Care System and will utilize the opioid epidemic as example issue for focus. The second portion of the course will focus on the PA profession, regulation, political issues and professional organizationss. Credit: 1. Everett

PHYASST-255. Evidence-Based Practice 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 Courses - Elective

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. Staff

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. Staff

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. Staff

Clinical Year Courses - Required

PHYASST 299. Bridge: The Path to Patient Care. This two-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 clinical courses 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 Practice II. This required four-week course helps students to build skills in evidence-based medicine and quality improvement. The evidence-based medicine component focuses on finding and using best available evidence to address clinical questions. The quality improvement component builds the student's capacity to examine population health and clinical quality indicators and to plan interventions to improve quality of health and healthcare. Credit: 3. Morgan

PHYASST-310. Behavioral Medicine. This four-week course 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-320A, 320B. Internal Medicine. These two, four-week courses 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

PHYASST-370. Women's Health. This four-week course provides an 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

PHYASST-360. Pediatrics. This four-week course 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

PHYASST-340. General Surgery. This four-week course 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 course 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

PHYASST-390. Senior Seminar. This longitudinal course is conducted in small group and lecture settings, and allows students to review common medical topics and procedures as well as professional development topics. A final summative evaluation is part of this course. Students prepare for the PA National Certifying Examination (PANCE) during structured review activities. Credit: 2. Stouder

Clinical Year Courses – Elective

In addition to the above required core clinical courses, each student is required to complete 2 electives that can be chosen from among the following elective courses. All are 4 weeks in length.

General Electives

PHYASST-300E Primary Care. This course 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, 3) Healthcare for the Homeless. Credit: 4. Staff

PHYASST-301. Occupational Medicine. This course offers an opportunity for students to understand the principles of occupational medicine. Students will develop the assessment and procedural skills necessary to diagnose and manage common workplace injuries and screening employment evaluations. Credit: 4. Staff

PHYASST-302. Geriatrics. This course emphasizes the evaluation and management of geriatric patients in outpatient, long-term care or hospital settings. Students will focus on developing the assessment and communication skills necessary to diagnose and treat elders with the medical concerns most common in this age group. Credit: 4. Staff

PHYASST-303. Global Health. This course offers clinical experiences 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 course 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 course 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 course provides 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 course 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 course 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-311. Clinical Research. This four-week elective rotation is an opportunity for students to learn the intricacies of site-based clinical research with a concentration in early phase studies conducted at the Duke Clinical Research Unit (DCRU). The DCRU provides an exceptional environment for training of students because it has dedicated teams for study conduct including recruitment, operations, nursing, laboratory, regulatory, dietary, and faculty in the same space. Students will develop an in-depth understanding for the major concepts of clinical research and learn to apply them as appropriate. Credits: 4. Staff

PHYASST-312. Community Health. This elective introduces students to the concepts and practice of community-engaged 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. Credits: 4. Staff

PHYASST-313. LGBTQ Health. This elective provides an opportunity for students to understand the principles of providing care to lesbian, gay, bisexual, transgender and gender-expansive children and adults with differences in sex development. Students will build upon their knowledge of human development, anatomy and physiology while learning about various treatments for patients seeking gender related healthcare. Credits: 4. Staff

PHYASST-320E. Internal Medicine. This course 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 course 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 course provides opportunity for students to increase their knowledge of the triage and management of medical emergencies. Credit: 4. Staff

PHYASST-360E. Pediatrics. The course 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. Women's Health. This course provides students with the opportunity to learn about common gynecological problems and preventative care. Credit: 4. Staff

Obstetrics/Gynecology

PHYASST-371. Maternal/Fetal Medicine. This course emphasizes prenatal and postpartum care of patients with high-risk pregnancies. Credit: 4. Staff

PHYASST-372. Reproductive Endocrinology and Infertility. This course 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 course offers an opportunity for students to understand the principles of caring for patients with acute and chronic cardiovascular disease. Students will utilize knowledge of cardiovascular anatomy, physiology and pathophysiology and develop critical thinking skills in regards to diagnosis and management of cardiac diseases. Credit: 4. Staff

PHYASST-322. Dermatology. This course offers an opportunity for students to understand the principles of dermatology and develop the observational, diagnostic, and procedural skills necessary for care of hair, skin and nail disorders. Credit: 4. Staff

PHYASST-323. Endocrinology. This course offers students an opportunity to understand the principles of endocrinology. Building upon their prior knowledge of anatomy, physiology and pathophysiology, students will learn to assess and manage patients with acute and chronic endocrine dysfunction. Credit: 4. Staff

PHYASST-324. Pain Medicine. This course 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 course offers exposure to the principles of hematology and oncology and their application in clinical practice. 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 course emphasizes the evaluation and treatment of various infectious diseases. Topics include: 1) General Infectious Disease, 2) HIV. Credit: 4. Staff

PHYASST-328. Gastroenterology. This course provides an opportunity for students to build upon their prior knowledge of anatomy, physiology and pathophysiology and emphasizes the evaluation and treatment of a variety of acute and chronic gastrointestinal disorders. Credit: 4. Staff

PHYASST-329. Palliative Care. This course offers experience in palliative care/symptom management, discussions with patients and families regarding goals of care and end of life care. Credit: 4. Staff

PHYASST-331. Nephrology. This course offers an opportunity to understand the principles of nephrology, and builds upon prior knowledge of anatomy, physiology and pathophysiology. Students will learn to assess and management a variety of acute and chronic renal disorders. Credit: 4. Staff

PHYASST-332. Neurology. This course provides an opportunity for students to understand the principles of neurology and care for patients in inpatient and outpatient settings. Students will build upon their prior knowledge of anatomy, physiology and pathophysiology as they focus on neurological assessment and management of a variety of acute and chronic disorders. Credit: 4. Staff

PHYASST-333. Pulmonary Medicine. This course emphasizes prevention, cause, diagnosis and treatment of various acute and chronic pulmonary diseases. Credit: 4. Staff

PHYASST-334. Rheumatology. This course emphasizes experience with the assessment of joint, connective tissue and autoimmune disorders. Credit: 4. Staff

PHYASST-336. Medical ICU. This course offers an opportunity for student to understand the principles of medicine in an intensive care setting. Students will be challenged to build on prior knowledge as they develop the critical diagnostic and procedural skills necessary to care for patients with life-threatening illnesses. Credit: 4. Staff

PHYASST-337. Coronary Care Unit. This course offers an opportunity for students to understand the principles of critical care medicine in a coronary care unit. Students will be challenged to build upon prior knowledge as they develop the critical diagnostic and procedural skills necessary to care for patients with life-threatening cardiac illnesses. Credit: 4. Staff

PHYASST-338. Radiology. This course 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 course offers experiences with patients at risk for or diagnosed with various hereditary syndromes. The patient population includes both pediatric and adults with genetic disorders. Students will gain an appreciation for genetic patterns of inheritance and the multidisciplinary care approach to patients in this medical specialty. Credit: 4. Staff

Ophthalmology

PHYASST-381. Ophthalmology. This course offers exposure to the evaluation and treatment of a variety of disorders involving the eye, including both surgical and non-surgical therapeutic approaches. Credit: 4. Staff

Pediatrics

PHYASST-308. Pediatric Healthy Lifestyles Program. In this course, 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 course offers students an opportunity to improve their understanding of the principles of pediatric cardiovascular disorders. Expanding upon their prior knowledge and skills gained during the pediatrics course, students will gain skills in the diagnosis and management of children with congenital anomalies and other cardiac disorders. Patient care experiences are in outpatient, inpatient or operative settings. Credit: 4. Staff

PHYASST-362. Pediatric Surgery/Cardiothoracic Surgery. This course offers students an opportunity to improve their understanding of pediatric cardiovascular disorders which require surgical intervention. Credit: 4. Staff

PHYASST-363. Pediatric Hematology/Oncology. This course offers students an opportunity to understand the principles of caring for children with hematologic or oncologic diagnoses. Students will build upon knowledge gained in the pediatrics course to develop critical thinking skills related to diagnosis and management of pediatric patients. Emphasis is placed on communication skills and relating sensitively to both children and parents. Credit: 4. Staff

PHYASST-364. Pediatric Respiratory. This course offers students an opportunity to expand their knowledge the evaluation and treatment of allergy and respiratory problems in the pediatric patient. Students will manage patients with a focus on prevention, diagnosis and treatment of a variety of acute and chronic respiratory disorders. Credit: 4. Staff

PHYASST-365. Pediatric Endocrinology. This course offers exposure to the evaluation and management of a broad range of acute and chronic endocrine problems in the pediatric patient. Credit: 4. Staff

PHYASST-366. Pediatric Infectious Disease. This course emphasizes the evaluation and treatment of various acute and chronic infectious diseases in the pediatric patient. Credit: 4. Staff

PHYASST-367. Intensive Care Nursery. This course emphasizes the care of the children 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 course offers opportunity to manage acute and emergent problems of the pediatric patient in the emergency department setting. Credit: 4. Staff

PHYASST-369. Pediatric Orthopedics. This course offers exposure to acute and chronic pediatric orthopedic care in the outpatient and surgical settings. Credit: 4. Staff.

Surgery

PHYASST-341. Cardiothoracic Surgery. This course offers students experiences in the diagnosis and management of patients in need of cardiothoracic surgery. Students will build upon skills gained in the general surgery course with emphasis on improving surgical skills and patient management specific to cardiothoracic surgery. Credit: 4. Staff

PHYASST-342. Otolaryngology. This course offers experiences in otolaryngology in outpatient and surgical settings. Students will develop the observational, diagnostic and procedural skills necessary for the evaluation and management of patients presenting with a variety of acute and chronic otolaryngology disorders. Credit: 4. Staff

PHYASST-343. Neurosurgery. This course offers students an opportunity to understand the principles of neurologic surgery, and build upon skills gained during the general surgery course. Emphasis will be on improving surgical skills and patient management specific to the specialty of neurosurgery. Credit: 4. Staff

PHYASST-344. Orthopedics. This course offers experiences in the evaluation and treatment of orthopedic problems. Topics include: 1) General Orthopedics, 2) Orthopedic hospitalist. Credit: 4. Staff

PHYASST-345. Plastic Surgery. This course offers students experiences in the plastic and reconstructive procedures. Students will build upon knowledge gained during the general surgery course, with an emphasis on improving surgical skills. Credit: 4. Staff

PHYASST-346. Sports Medicine. This course offers students an opportunity to understand the principles of sports medicine. Building upon prior knowledge of anatomy and conditions affecting the musculoskeletal system, students will practice orthopedic examination and procedural skills, with specific emphasis on care of physically active patients, including athletes. Credit: 4. Staff

PHYASST-347. Urology. This course offers experiences in the evaluation and treatment of urologic problems in the outpatient and operative settings. Credit: 4. Staff

PHYASST-348. Pre-Operative Screening Unit. This course offers the opportunity to evaluate pre-operative patients who require medical clearance prior to their procedure. Credit: 4. Staff

PHYASST-349. Surgical Oncology. This course offers exposure to patients with malignancies who require surgical evaluation and management, and includes experiences in outpatient and surgical settings. Credit: 4. Staff

PHYASST-352. Trauma. This course offers students the opportunity to explore the practice of providing care to patients requiring trauma and critical care services. Students will develop the critical thinking and procedural skills required in assessment, diagnosis and management of patients experiencing traumatic injuries. Credit: 4. Staff

PHYASST-353. Surgical ICU. This course 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 course offers students an opportunity to understand the principles of vascular surgery and builds upon the skills and knowledge from the general surgery course. Emphasis is on improving surgical skills and evaluation and treatment of vascular problems. Credit: 4. Staff

PHYASST-355. Transplant Surgery. This course provides an opportunity to participate in the evaluation and management of patients requiring solid organ transplant. Credit: 4. Staff

Jared Lazarus

School of Medicine Professional Certificate Programs

Marcie Ellis

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, BS, COMT

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 International Certification Examination for Ophthalmic Technicians administered by the International 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/optech;
- a $50.00 nonrefundable processing fee;
- official transcript(s) from schools attended;
- two original letters of recommendation from previous employers or course instructors; 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/optech.

Criminal Background Check

Candidates considered for admission to the Ophthalmic Medical Technician Program will undergo criminal background checks.

Academic Calendar 2018-2019

(51 weeks)

Fall 2018	July 5-December 21, 2018
Spring 2019	January 2-June 20, 2019

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 Duke Eye Center is closed for eight holidays yearly as follows:

Independence Day	Wednesday, July 4, 2018
Labor Day	Monday, September 3, 2018
Thanksgiving Day	Thursday and Friday, November 22 and 23, 2018
Christmas Day Observed	Tuesday, December 25, 2018
New Year's Day Observed	Tuesday, January 1, 2019
Martin Luther King, Jr. Day	Monday, January 21, 2019
Memorial Day	Monday, May 27, 2019

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

NOTE: 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 may be 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.

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 improve to 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

2018-2019 tuition for the program is $9000. 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: https://medschool.duke.edu/education/student-services/office-financial-aid/resources.

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 on the website 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
https://medschool.duke.edu/education/student-services/office-financial-aid

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/resources.

Computer Technology

A personal computer and a personal cell phone are necessary tools for success in the program. Four 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 email and all students receive a Duke email 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 manor. Credit: 1.0. *Staff*

OPTECH 156. Cardiopulmonary Resuscitation. CPR certification is required prior to the beginning of clinical rotations. 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 is necessary for accurate communication in any healthcare career. Credit: 0.50. *Staff*

OPTECH 161, 161L. Spectacles. This course provides instruction on reading and accurately documenting the prescription of glasses and contact lenses including bi-focal power, prism power and orientation as well as 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 patient interactions in various situations. The student will learn techniques for addressing patient complaints and diffusing difficult situations. Credit: 0.50. *Staff*

OPTECH 170. Clinical Rotations. Credit: 30.00. *Staff*

TOTAL Credit Hours: 54.75

Les Todd

General Information for Students

Les Todd

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 http://www.nearduke.com. For more information, contact Duke Community Housing at (919) 684-4304 or email 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 (email) 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 email account upon acceptance of an offer of admission. It is the student's responsibility to check this email account regularly and to respond promptly to requests made by email.

Off-Campus Housing

Housing and Residence Life, in partnership with the *Chronicle,* offers an off-campus housing website as a resource to locate off-campus rental housing options in the Durham area. The *Chronicle* maintains the website of available rental housing which is accessible through http://www.nearduke.com/housing. For concerns or questions regarding off-campus housing, the Housing Assignments 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 a variety of locations and authentic cuisine to include Indian, East & Southeast Asian, Italian, dedicated vegan & vegetarian, comfort favorites, white-tablecloth dining, wood-fired finely cooked meats, sushi and menu items with locally-grown ingredients. 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 Duke Dining 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 55 dining options. Their mission is to provide a delicious, nutritious, affordable community dining experience, no matter where you choose to eat on campus. Duke Dining's Merchant-on-Points program expands student choices to a variety of off-campus vendors that deliver anywhere on campus on all meal plans. Also, keep an eye out for food trucks! Please visit http://dining.duke.edu for locations, menus & hours and dietary and nutrition information. Be sure to visit the Brodhead Center which offers 14 dining locations that produce cutting-edge, world-class and innovative menus and food.

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 Parking 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.-5 p.m. 302 Science Drive office hours: Monday-Friday, 9 a.m.-5 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, 302 Science Drive.

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, 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 in the Student Wellness Center at 305 Towerview Road. 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 and walk-in between the hours of 7:50 a.m. to 4:30 p.m., Monday, Thursday, and Friday; 7:50 a.m. to 6:50 p.m. on Tuesday; and 8:50 a.m. to 4:50 p.m. on Wednesday. Appointments can be made online through Duke MyChart (dukemychart.org) or by calling (919) 681-9355. Limited clinic hours are available on select Saturdays during the fall and spring semesters—call ahead for availability. Nurse advice is available at all hours when the SHC is closed. (HealthLink - (919) 966-3820). See https://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 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 https://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 wavier. 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; men's health exams
- laboratory services performed at Student Health: CBC, urinalysis, rapid tests for strep throat, mononucleosis, vaginitis, pregnancy, rapid influenza test;
- administration of allergy/immunotherapy shots;
- nutrition consultation;
- health promotion services provided by DUWell staff;
- services provided by Counseling and Psychological Services (CAPS)

Services not Covered by the Health Fee. If unsure whether a service is covered, students should contact the Student Health Insurance Manager (shs-insurance@duke.edu) 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
- physical therapy
- 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 will receive an email from Duke Student Health 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). Students are asked to monitor their Duke email to ensure they receive the enrollment information. During Open Enrollment between mid-June until September 17, 2018, students who have their own coverage that meets the waiver requirements will be able to submit an online waiver (KAISER PERMANENTE IS NOT WAIVABLE). In the email, 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 (CHIP) 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 the Duke Student Health insurance department at insurance@studentsaffairs.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 routine medical 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. You will be automatically enrolled; no action is required on your part. 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

Students who are currently enrolled in Duke SMIP will have the opportunity to re-enroll in our early open enrollment by early June 2018. The insurance department will begin sending emails in early April. Please wait for the email before calling since the phone lines will be very busy.

Counseling and Psychological Services

Counseling and Psychological Services (CAPS) is located on the third floor of the Wellness Building at 305 Towerview Road. CAPS, a department of the Division of Student Affairs, provides a range of counseling, psychiatric, and referral services to assist Duke students with concerns ranging from adjustment difficulties to clinical issues such as depression and anxiety.

CAPS provides direct services to students including brief individual counseling, couples counseling, group therapy, psychiatric evaluation with medication management, and health coaching. In addition, CAPS offers a series of programs, support groups, and life-skills workshops. Recent offerings have focused on stress, anxiety, interpersonal relationships, meditation, and racial/cultural identity.

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, psychiatrists, and psychiatric nurse practitioners experienced in working with university students. To get started with services, please come to CAPS between 9:00 a.m. and 4:00 p.m. Monday through Friday. You will meet with a counselor who will help determine the services that are the best fit for your concerns.

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 faculty, staff, students, and housestaff from Duke Hospital, 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.

We have thousands of health sciences journal titles available electronically, though some of the older years may not be accessible online. 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 articles from stored journals may be requested for free by Duke Health 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, and we also have a few 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, the online catalog, and other resources are available, along with a variety of study spaces and rooms for online booking. 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 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 on the website 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.). Duke Health 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 Health 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: Megan von Isenburg, MSLS (UNC School of Information and Library Science, 2004).

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 faculty and staff strive 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 provide state-of-the-art student-centered medical education. The facilities include the learning hall with extensive technology to deliver interactive lectures, 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), a simulation floor and the Clinical Skills lab for teaching and assessment of clinical skills.

Located on the third floor of the Seeley Mudd building (now attached to the TSCHE) and the fifth floor of the TSCHE, the Office of Curricular Affairs provides program support including initial course planning and 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 systems; and liaison with Duke-National University of Singapore.

Clinical Performance Examination (CPX)

The CPX is a standardized patient exam which consists of ten 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 represented throughout 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.

All student encounters with standardized patients during the CPX 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 were discharged and more than 50,000 surgical procedures were performed in fiscal year 2015.

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.

Durham VA Health Care System

Since 1953, Durham VA Health Care System (DVAHCS) 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 DVAHCS is a 245-bed tertiary care referral, teaching, and research facility affiliated with Duke University School of Medicine. The DVAHCS 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 three Community Based Outpatient Clinics (CBOCs), one located in Morehead City and two in Raleigh, North Carolina. Two outpatient Clinics are also located on Hillandale Road in Durham, one Mental Health specialty clinic in southern Raleigh, and 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 DVAHCS 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. For additional information, visit https://www.durham.va.gov/.

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, neurologic, orthopaedic, gastrointestinal and neurodevelopmental disorders. On-site services include physical and occupational therapy and speech pathology. In addition, several multidisciplinary clinics are conveniently located on site.

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, oncology, emergency medicine, and outpatient surgery. Duke Regional features a level II Special Care Nursery, Duke Cancer Center North Durham, and Duke Rehabilitation Institute as well as James E. Davis

Ambulatory Surgical Center, Duke Regional Hospital Spine and Neurosciences, and Duke Regional Hospital Vascular Access clinics. 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 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 Health conveniently located in Wake County. Duke Raleigh has been an important member of the Duke University Health System since 1998 and has provided high-quality, compassionate care to the citizens of Wake County for more than 100 years.

Duke Raleigh is a 186-bed hospital providing a comprehensive array of services including a cancer center, orthopaedics, neurosciences, spine, cardiovascular services, disease management, inpatient care, emergency services, surgical services, outpatient imaging, community education events, and more. 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 Duke University Hospital, Durham Veteran's Administration Medical Center, Duke Regional Hospital, Duke Raleigh Hospital, and 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, Outpatient clinics, food court, and amphitheater; *Edwin A. Morris Building*—Outpatient clinics, diagnostic, treatment, and support services, Department of Radiation Oncology administration, departmental research and offices; *Davison Building*—Hospital Pharmacy offices; Prosthetics & Orthotics; Departments of Pathology, Brain Imaging & Analysis, and Radiology administration, research education space and offices; Duke Medicine and Health System Administration, and School of Medicine Administration; *Original Hospital, 1940 and 1957 Additions*—Outpatient Clinics, diagnostic, treatment, and support services including: clinical laboratories, pharmacy, Departments of Psychiatry, Dermatology, Community & Family Medicine; Medicine, Neurology, Orthopedics, Pathology offices; *Baker House*— Departments of Obstetrics and Gynecology, Anesthesiology, Medicine, Neurosurgery, and Surgery administration, clinical support services; and offices pastoral care and counseling, and Neuro-Oncology Program; *Barnes Woodhall Building*—Psychiatry inpatient care unit, Clinical Research unit, Departments of Psychiatry, Radiology, Radiation Oncology and Surgery diagnostic, treatment, and support services and research and offices, PRMO offices, outpatient pharmacy, preoperative screening, and hospital administration; *Diagnostic and Treatment #3 Building*—Departmental research support services and offices; *Ewald W. Busse Building*—Center for the Study of Aging and Human Development, diagnostic, treatment, and support services, research, and offices; *Eugene A. Stead Building*—General Clinical Research Center (Rankin), Departments of Surgery, Neurosurgery, Psychiatry, Medicine and Duke Cancer Institute research and offices; *Clinical Research II*—Departments of Surgery, Anesthesiology, Psychiatry, and Radiology research and offices, hyperbaric medicine unit. Other buildings within The Clinic Zone also includes *Marshall Pickens Building*—Family Medicine Clinics, ; *Parking Garage I*; and the *Cancer Center facility*: diagnostic, treatment, and support services.

The Hospital Zone consists of the following buildings: *Duke Hospital*—Eight contiguous buildings including: *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 offices; *MRI facilities and Brain Imaging and Analysis facility*; and *Children's Health Center*—Department of Brain Imaging and Analysis and Children's clinics, diagnostic, treatment and support services, Department of Pediatrics administrative offices. The Hospital zone also includes *Duke Eye Ctr Joseph A.C. Wadsworth Building (Eye Center)*—Clinical Labs; clinics, diagnostic, treatment, and support services including: operating rooms, recovery, research and offices; *Duke Eye Ctr Albert Eye Research Institute*—Ophthalmology faculty offices and research space and Pediatrics Ophthalmology Clinic; *Duke Eye Ctr Hudson Eye Building*—Department of Ophthalmology administration; Clinical Labs; Duke Eye clinics; *Civitan Building and Child Development & Behavioral Clinic*—Clinics and offices for the Departments of Psychiatry and Pediatrics. *Hanes House* --- Physician Assistant Program, Clinical Research Training Program, Departments of Community and Family Medicine, Medicine, Pediatrics 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, Departments of Surgery, Medicine and Duke Cancer Institute offices; *Parking Garage II*—House Staff and Exercise Facility, and Nursing Recruitment and the *Duke Medicine Pavilion*—Inpatient care units, diagnostic, treatment, and support services including operating and recovery, radiology, Clinical Labs, 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 and Neurology administration, departmental research and offices ; *Nanaline H. Duke Building*—Departments of Biochemistry, Dermatology, and Cell Biology administration, departmental research and offices; *Alex H. Sands Building*—Departments of Anesthesiology, Biochemistry, Cell Biology, Obstetrics and Gynecology, Medicine and Neurosurgery research and offices; *Edwin L. Jones Building*—

Departments of Immunology Pediatrics, Pathology, Surgery, and Molecular Genetics & Microbiology administration, departmental research and offices; *Medical Sciences Research Building*—Departments of Medicine, Pathology, Pediatrics, Radiation Oncology, Surgery, and Duke Cancer Institute research and offices; *Clinical and Research Laboratory Building*—Departments of Cell Biology, Molecular Genetics & Microbiology, and Medicine research and offices; *Leon Levine Science Research Center, section C*—Duke Institute for Brain Sciences, Department of Pharmacology & Cancer Biology administration, research and offices; *Surgical Oncology Research Building*; *Environmental Safety Building*; *Research Park Buildings 1, 2, 3 and 4*—Departments of Surgery, Radiology, Pharmacology & Cancer Biology, Duke Human Vaccine Institute (DHVI); Duke Translational Medicine Institute research and offices, and Occupational and environmental safety; and Clinic Labs; *Vivarium & Surgical Research Pavilion*; *Cancer Center Isolation Facility*; *Snyderman Genome Science Research Building*; and *Genome Science Research Building-II*— Departments of Anesthesiology, Neurobiology, Surgery, Duke Cancer Institute, Medicine and Pediatrics genomic science research; *Medical Sciences Research Building-II*—Departments of Medicine, Surgery and Duke Human Vaccine Institute research and offices; and *Global Health Research Building*—DHVI research and offices.

The West Zone consists of the *Lenox Baker Hospital*—Clinics, diagnostic, treatment, and support services, Departments of Pediatrics and Orthopedics offices, and mobile MRIs; Center for Living Campus consists of five buildings including *Sarah Stedman Nutrition Center*— Duke Molecular Physiology Institute (DMPI) offices ; *Andrew Wallace Clinic Building (original and 2015 addition)*— Department of Orthopedics and Sports Medicine clinics, diagnostic, treatment, and support services; *PepsiCo Fitness Center*—Exercise and physical therapy 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) Duke Translational Medicine Institute (DTMI), Medicine and Duke Cancer Institute offices; and *2216 Elba Street (House of Healing)*—small residence for families and patients; and *Elder Street Buildings*—School of Nursing offices, occupational and environmental safety, and medical center engineering and operation.

Jared Lazarus

Graduate Program Information

Les Todd

Accreditation Council for Graduate Medical Education Accredited 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 and the program training director of each service are as follows:

Adult Cardiothoracic Anesthesiology	Dr. Brandi Bottiger
Adult Congenital Heart Disease	Dr. Cary Ward
Adult Reconstructive Orthopaedics	Dr. Michael Bolognesi
Advanced Heart Failure and Transplant Cardiology	Dr. Gary Michael Felker
Allergy and Immunology	Dr. Joseph Roberts
Anesthesiology	Dr. Annemarie Thompson
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 Informatics	Dr. Eric Poon
Clinical Neurophysiology	Dr. Aatif Husain
Complex General Surgical Oncology	Dr. Trey Blazer
Cytopathology	Dr. Sarah Bean
Dermatology	Dr. Amber Atwater
Dermatopathology	Dr. Maria Selim
Diagnostic Radiology	Dr. Karen Johnson
Emergency Medicine	Dr. Joshua Broder
Endocrinology, Diabetes and Metabolism	Dr. Matt Crowley
Family Medicine	Dr. Viviana Martinez-Bianchi
Female Pelvic Medicine and Reconstructive Surgery	Dr. Cindy Amundsen
Foot and Ankle Orthopaedics	Dr. James Nunley
Gastroenterology	Dr. Andrew Wolf
Geriatric Medicine	Dr. Mitchell Heflin
Geriatric Psychiatry	Dr. Tracy Holsinger
Gynecologic Oncology	Dr. Paula Lee
Hand Surgery	Dr. Fraser Leversedge
Hematology (Hematopathology) Fellowship	Dr. Endi Wang
Hematology/Medical Oncology	Dr. Carlos de Castro III
Hospice and Palliative Medicine	Dr. Jason Webb
Infectious Disease	Dr. Gary Cox
Internal Medicine	Dr. Aimee Zaas
Internal Medicine (P)	Dr. Aimee Zaas
Internal Medicine/Pediatrics	Dr. Jane Trinh
Internal Medicine/Psychiatry	Dr. Sarah Rivelli
Interventional Cardiology	Dr. Michael Sketch
Interventional Radiology – Integrated	Dr. Paul Suhocki
Maternal – Fetal Medicine	Dr. Breanna Hughes
Medical Biochemical Genetics	Dr. Marie McDonald
Medical Genetics	Dr. Marie McDonald
Medical Microbiology	Dr. Barbara Alexander
Neonatal-Perinatal Medicine	Dr. Ronald Goldberg
Nephrology	Dr. Ruediger Lehrich

Neurological Surgery	Dr. Michael Haglund
Neurology	Dr. Saurabh Sinha
Neuromuscular Medicine	Dr. Karissa Gable
Neuropathology	Dr. Christine Hulette
Neuroradiology	Dr. James Eastwood
Nuclear Medicine	Dr. Michael Hanson
Nuclear Radiology	Dr. Michael Hanson
Obstetric Anesthesiology	Dr. Jennifer Dominguez
Obstetrics and Gynecology	Dr. Beverly Gray
Ophthalmology	Dr. Pratap Challa
Orthopaedic Surgery	Dr. Brian Brigman
Orthopaedic Sports Medicine	Dr. Dean Taylor
Otolaryngology	Dr. Charles Woodard
Pain Medicine Anesthesiology	Dr. Lance Roy
Pathology – Anatomic and Clinical	Dr. Thomas Cummings
Pediatric Anesthesiology	Dr. John Eck
Pediatric Cardiology	Dr. Michael Jay Campbell
Pediatric Critical Care Medicine	Dr. Travis Vesel
Pediatric Endocrinology	Dr. Deanna Adkins
Pediatric Hematology-Oncology	Dr. Susan Kreissman
Pediatric Infectious Diseases	Dr. William Steinbach
Pediatric Nephrology	Dr. Shashi Nagaraj
Pediatric Pulmonology	Dr. Richard Kravitz
Pediatric Radiology	Dr. Gary Schooler
Pediatric Rheumatology	Dr. Heather Van Mater
Pediatrics	Dr. Betty Staples
Plastic Surgery	Dr. Suhail Mithani
Plastic Surgery - Integrated	Dr. Suhail Mithani
Preventive Medicine	Dr. Dennis Darcey
Psychiatry	Dr. Jane Gagliardi
Pulmonary Diseases/Critical Care Medicine	Dr. Scott Shofer
Radiation Oncology	Dr. Joseph Salama
Regional Anesthesiology and Acute Pain Medicine	Dr. Jeff Gadsden
Rheumatology	Dr. Lisa Criscione-Schreiber
Sleep Medicine	Dr. Aatif Husain
Sports Medicine (FP)	Dr. Tracy Ray
Surgery	Dr. John Migaly
Surgery (P)	Dr. John Migaly
Surgical Critical Care	Dr. Amy Alger
Thoracic Surgery	Dr. Thomas D'Amico
Thoracic Surgery – Integrated	Dr. Thomas D'Amico
Transplant Hepatology	Dr. Carl Berg
Undersea and Hyperbaric Med.-Prev. Med.	Dr. John Freiberger
Urology	Dr. Drew Peterson
Vascular Neurology	Dr. Jodi Dodds
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

Eligibility for membership to the Associate Medical Staff (Graduate Medical Trainee) includes:

- 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

Additionally, the following requirements apply to all members of the Associate Medical Staff:

- ACGME Residency and Fellowship applicants must meet all existing requirements for entry into ACGME subspecialty programs
- Have a Full State License or Resident Training License (RTL)
- Official medical school transcript with conferred or graduated date
- A completed Postgraduate Training Verification Form (if applicable)
- Appropriate current life-support skills (e.g., 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 reference forms, criminal background check, National Practioner Databank check, EPLS check, OIG check, and ECFMG check for IMG's.)
- Completion of all required online safety training
- Completion of all required payroll forms
- Completion of all prerequisite institutional 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 statement if trainee has not passed Step 3)
- Attend Institutional Orientation

A trainee may begin his/her clinical duties after 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) 684-5375; pgilbert@duke.edu; http://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 ECMFG and the examination requirements, physicians must write to ECFMG, 3624 Market Street, Philadelphia, PA, 19104, or visit the website at http://www.ecfmg.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://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 email visahelp@mc.duke.edu.

Continuing Medical Education

Paula J. Alford

The mission of the Continuing Medical Education (CME) Program, as part of the Joint Accreditation Program Office, 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 Joint Accreditation 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 Health System Department of Clinical Education and Professional Development (CEPD) designates all types of activities: live presentations, online education, simulation, medical games, and enduring materials (monographs, DVD, etc). The Duke University Health System Department of Clinical Education and Professional Development (CEPD) provides educational programs inclusive of medicine, nursing, pharmacy, and other healthcare providers.

To obtain a listing of current CME activities, you may check the School of Medicine website or http://ja.dh.duke.edu/. To request credit for a meeting, please contact Department of Clinical Education and Professional Development DUMC Box 2722, 2424 Erwin Road, Hock Plaza 1, Suite G07, Durham, NC 27705; (919)-385-4339. To view your Duke CME transcripts, please log into http://ja.dh.duke.edu/.

Jared Lazarus

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