Carnegie Mellon’s Unique Interdisciplinary Approach

Carnegie Mellon University takes an interdisciplinary approach to teaching and research—encouraging collaboration among students and faculty across departments and colleges. This unique perspective fosters the growth of innovative discoveries that provide solutions to real-world problems in a variety of disciplines.

This brochure provides an overview of graduate programs offered at Carnegie Mellon in health-related fields—from computer science, engineering, and science disciplines to health economics and policy, and our joint program with the University of Pittsburgh for the MD/Ph.D. program. We encourage you to explore the websites listed, and to call or e-mail the programs if you have questions.

Additional research opportunities exist outside of the degree programs, such as the innovative exploration being done in on-campus centers such as the Bone Tissue Engineering Center, the Center for the Neural Basis of Cognition and the Medical Robotics Technology Center. See the last page for a comprehensive list of our research centers in health-related disciplines.

Admissions to Graduate Programs

Admission to graduate programs is handled by the individual academic departments, and requirements and deadlines vary from department to department. For detailed information on the individual programs, refer to the contact information provided in the margin of each page.

Funding For Graduate Study

Doctoral programs at Carnegie Mellon usually provide tuition and stipends for their students. Master’s programs are typically not funded, but partial departmental assistance may be available. Additionally, various types of financial aid are available for Master’s and Ph.D. programs. For more information, contact the individual departments or Enrollment Services (www.cmu.edu/finaid/basics/graduate/index.html).

Detailed information can be found through each department. General information regarding graduate education can be found at: www.cmu.edu/graduate
General inquiries can be directed to: grad-ed@cmu.edu
Ph.D. in Behavioral Decision Research

Behavioral decision research draws on insights from psychology and economics to provide a descriptively realistic picture of human decision making. The program combines ideas from economics about purposeful and directed decision making with those from psychology that recognize the influence of social, cognitive and emotional factors on such choices. The combination of these perspectives leads behavioral decision research to focus on both the ideals and realities of decision making and on ways in which both research and practice might be improved. This is one of the focus areas in the Social and Decision Sciences Ph.D. program.

Our students typically hold undergraduate degrees in
- Economics
- Psychology

Career paths include
- Health-related policy positions in Government and Private Agencies
- Academic research in Decision Science, Policy, and Public Health

For more information
www.cmu.edu/dietrich/sds/
(412)268-3665
sds-info@andrew.cmu.edu

Ph.D. in Psychology

Research on health psychology addresses topics such as self-regulation, stress and coping, the impact of personality characteristics and social support on health, the impact of stress on disease, pathways linking mindfulness meditation with health outcomes, the role of psychological and social factors in heart disease, cancer and infectious diseases, and the social, emotional, and genetic aspects of addictive behaviors.

Our students typically hold undergraduate degrees in
- Psychology and Other Social Sciences
- Biology
- Master’s degrees in Public Health

Career paths include
- Academic Psychology
- Public Health
- Research Institutions
- Medical Research

For more information
www.psy.cmu.edu/grad_program/index.html
(412)268-6026
Ph.D. in Biological Sciences

The Ph.D. in Biological Sciences program exemplifies the interdisciplinary approach that has become an essential feature of modern biomedical science. The Ph.D. program stresses the development of strong research and teaching skills. Graduate students in the Department of Biological Sciences benefit from a flexible, supportive program that stresses individualized training and a diverse research environment that is rich in intellectual and technical resources. Health-related areas of focus include biotechnology, genetics/genomics, computational biology, microbiology, and neuroscience.

Our students typically hold undergraduate degrees in
- Biology
- Chemistry
- Computer Science
- Engineering
- Physics

Career paths include
- Academia
- Bioethics, Law or Administration
- Industry
- Government
- Scientific Writing

For more information
www.cmu.edu/bio/graduate/
(412)268-3012
bio-gradoffice@andrew.cmu.edu
Our students typically hold undergraduate degrees in:
- An Engineering Major (e.g., Biomedical, Chemical, Electrical or Computer)
- Mathematics
- A Science Major (e.g., Biology, Chemistry or Physics)

Career paths include:
- Pharmaceutical, Biotechnology and Medical Device Industrial Sectors
- Clinical Healthcare Settings
- Basic and Applied Research

For more information:
www.bme.cmu.edu/gradprog/index.html
(412)268-4707

Education and research for the Master’s and Ph.D. programs focus on biomaterials, biomechanics at both the molecular/cellular and cardiovascular/tissue level, biomedical imaging and image informatics, biomedical nanotechnology, drug delivery, medical devices and robotics, neural engineering, and regenerative medicine.

Master of Biomedical Engineering (Research or Practicum Option)
The Master’s program in Biomedical Engineering is built upon the deep interdisciplinary, collaborative culture of Carnegie Mellon University. The M.S. program creates an ideal environment for career transitions—between colleges and medical/graduate schools, and between traditional and biomedical engineering careers. The large degree of flexibility allows the curriculum to be tailored according to the student’s personal goals. In addition, a practicum provides training opportunities at local medical centers for translational research and clinical exposure.

Ph.D. in Biomedical Engineering
The Ph.D. program, based on a curriculum that balances breadth and depth, is designed to train students for faculty and leadership positions at universities, in hospitals, and in industry through coursework and research. In addition, a practicum provides training opportunities at local medical centers for translational research and clinical exposure.
Our students typically hold undergraduate degrees in
• A Natural or Physical Science (e.g., Biology, Chemistry, Physics)
• A Quantitative Science (e.g., Computer Science, Statistics, Mathematics)
• An Engineering Science (e.g., Biomedical, Chemical)
• An Interdisciplinary Science (e.g., Computational Biology, Bioinformatics, Computational Chemistry)

Career paths include
M.S.
• Basic or applied research programs in Academia, Industry or Government
• Leading teams in Pharmaceutical, Biotechnology and Medical Device Industrial Sectors
• Pursuing a Ph.D. following the M.S. Program

Ph.D.
• Leading basic or applied research programs in Academia, Industry or Government
• Leadership positions in Pharmaceutical, Biotechnology and Medical Device Industrial Sectors

For more information
M.S.
www.cmu.edu/ms-compbio/
(412)268-3012
mscb-admin@compbio.cmu.edu

Ph.D.
www.compbio.cmu.edu/
(412)268-2474
admissions@compbio.cmu.edu

M.S. in Computational Biology
The Department of Biological Sciences and the Ray and Stephanie Lane Center for Computational Biology offer a professional program leading to a Master of Science in Computational Biology. The integrated discipline of the program represents the application of modern computer science, statistics, and mathematics to exploring biological and biomedical problems. An active research community and strong tradition of interdisciplinary research ensure that students are positioned for careers in industry or research, or further graduate study.

Ph.D. Program in Computational Biology,
Joint Carnegie Mellon University – University of Pittsburgh
Computational Biology is the research field concerned with solving biological problems using mathematical and computational methods. This program combines the outstanding computational and biomedical research environments at two major research universities. Areas of study include machine learning, bioimage informatics, cellular and systems modeling, computational genomics, computational structural biology.
M.S. in Biotechnology Innovation and Computation
The Department of Biological Sciences and the Ray and Stephanie Lane Center for Computational Biology offer a program designed to educate leaders in applying software and computing technologies to create innovative solutions for the biotechnology, pharmaceutical and health care industries. Education focuses on utilizing data mining, information retrieval, machine learning, machine translation, computational linguistics, and computational biology technologies.

Our students typically hold undergraduate degrees in
- Computer Science
- Bioinformatics
- Business
- Engineering

Career paths include
- Technology Companies
- Pharmaceutical Companies
- Founding your own startup

For more information
bic.cs.cmu.edu/
(412)268-2474

Ph.D. in Engineering & Public Policy
While the Department does not have a formal program in health, some research in EPP addresses topics such as air pollution, climate change and health, energy and health, water and health, behavior and disease transmission, emerging technologies and health, and the characterization and communication of uncertainty in human health risk assessment.

Our students typically hold undergraduate degrees in
- Engineering
- Physical or Life Sciences
- Mathematics

Career paths include
- Academia
- Government Agencies or Laboratories
- Think Tanks
- Private Companies

Specific graduates in health related areas have included:
- Research Scientists, EPA
- Research Associates, RAND Corporation
- Risk Managers at FDA and USDA

For more information
www.epp.cmu.edu
(412)268-2670
eppadmt@andrew.cmu.edu
Our students typically hold undergraduate degrees in
- Medicine/Nursing
- Natural Sciences (e.g., Biology, Chemistry)
- Social Sciences (e.g., Economics, Psychology, Political Science)
- Humanities
- Business/Management

Career paths include
- Consulting for Health Care Organizations
- Government Health Policy Analysis
- Attending Medical School
- Health Care Administration

For more information
www.heinz.cmu.edu
(412)268-2164
hnzadmit@andrew.cmu.edu

M.S. in Health Care Policy and Management (MSHCPM)

M.S. in Public Policy and Management - Health Policy Electives (MSPPM)

Master of Public Management (MPM)
The full-time (MSPPM, MSHCPM, MPM) and part-time (MPM only) health care policy programs at Heinz College focus on problem solving skills—both quantitative and qualitative—that allows students to develop effective policies. Through an ever evolving curriculum dictated by industry, economic, political and social factors of health in the 21st century, graduates are trained to be leaders and thinkers in the professional areas of health administration and health services management. Students gain a fundamental background and knowledge base in the field which enables them to pursue careers as policy analysts in the health arena (for public, private, consulting, and non-profit organizations). Students also have the opportunity to gain experience in leadership and real-world applications of concepts learned in the classroom.

MSHCPM and M.B.A. Dual Degree
The MSHCPM/MBA is a 2.5-year (5 semesters) program. The program is designed to better educate students in understanding the interface between the private and public sectors and the health care industry.

Master of Medical Management (MMM)
The MMM trains physicians in management, leadership, and IT which they can apply to the healthcare delivery system. Focus is on developing core competencies, team based learning and strategic approaches to solving problems in the health sector.

Ph.D. in Public Policy and Management (Ph.D. in PPM)
While the focus of our doctoral program is broad with policy and management depth, one of our key areas of strength is in health policy. The importance of health care policy cannot be overstated. Many faculty members are working on the important role of competition, IT and regulations that affect the cost and quality of health delivery.
M.S. in Mechanical Engineering
(Course Work or Project Option)
Ph.D. in Mechanical Engineering

While the Mechanical Engineering department does not have a formal program in health, some research in MechE addresses topics such as heart disease, robotic prostheses, air pollution, climate change and health, and energy and health.

Students working in the Cell Mechanics Laboratory examine how cell mechanics applies to biology. This applies to a range of health related challenges including heart disease, cancer and nutrition in developing countries.

Students working in the Experimental Biomechatronics Laboratory design cutting-edge robotic prostheses and exoskeletons and use them in biomechanics experiments with human participants.

Students working in the Center for Atmospheric Particle Studies (CAPS) are recognized as leaders in the study of air quality and atmospheric chemistry.

Our students typically hold undergraduate degrees in
• An Engineering Major (e.g., Mechanical, Electrical, Computer, Biomedical, Chemical or Materials)
• A Science Major (e.g., Physics, Chemistry or Biology)
• Mathematics

Career paths include
• Private Companies
• Government Agencies or Laboratories
• Academia

For more information
www.cmu.edu/me/
(412)268-2500
meche-admissions@andrew.cmu.edu
Medical Scientist Training Program

Medical Scientist Training Program (MSTP)  
www.mdphd.pitt.edu/  

Biological Sciences  
Ph.D. and M.D.  
For more information  
www.cmu.edu/bio/graduate/  
(412)268-3012  
bio-gradoffice@andrew.cmu.edu  

Biomedical Engineering  
Ph.D. and M.D.  
For more information  
www.bme.cmu.edu/gradprog/index.html  
(412)268-4707  

Computational Biology  
Ph.D. and M.D.  
For more information  
www.compbio.cmu.edu/  
(412)268-2474  
admissions@compbio.cmu.edu  

Robotics  
Ph.D. and M.D.  
For more information  
medrobotics.ri.cmu.edu/  
(412) 268-2495  

Ph.D. and M.D. in Biological Sciences  
Ph.D. and M.D. in Biomedical Engineering  
Ph.D. and M.D. in Computational Biology  
Ph.D. and M.D. in Robotics  

The Medical Scientist Training Program (MSTP) of Carnegie Mellon University and the University of Pittsburgh was established in 1983 to offer talented individuals the opportunity to undertake a physician-scientist training program tailored to their specific research interests. For students who have a clearly-defined interest in biomedical research, the MSTP serves as a bridge between the University of Pittsburgh School of Medicine and several graduate programs in basic sciences or engineering at either the University of Pittsburgh or Carnegie Mellon University. During a period of six to eight years, individuals meet the degree requirements of both a Ph.D. and an M.D., thus acquiring the knowledge, skills and experience to begin careers in some of the most exciting areas of medical research.
Affiliated Centers

Carnegie Mellon encourages collaboration across departmental, college and institutional boundaries, continuing the university’s strong tradition of interdisciplinary research. The centers listed below provide opportunities for students to broaden their study and interaction with faculty in a broad range of disciplines.

**Bone Tissue Engineering Center**
www.cit.cmu.edu/research/centers/btec.html

**Center for the Advancement of Applied Ethics and Political Philosophy**
www.hss.cmu.edu/cep/

**Center for Atmospheric Particle Studies (CAPS)**
caps.web.cmu.edu/

**Center for Behavioral Decision Research**
www.cbdr.cmu.edu/

**Center for Bioimage Informatics**
www.cbi.cmu.edu/

**Center for Cognitive Brain Imaging**
www.ccbi.cmu.edu/

**Center for Integrated Study of the Human Dimensions of Global Change**
www.hdgc.epp.cmu.edu/

**Center for Macromolecular Engineering**
www.chem.cmu.edu/groups/maty/center/

**Center for the Mechanics and Engineering of Cellular Systems (CMECS)**
www.cmu.edu/cmeecs/

**Center for Molecular Analysis**
www.chem.cmu.edu/cma

**Center for the Neural Basis of Cognition**
www.cnbc.cmu.edu

**Center for Nucleic Acids Science and Technology (CNAST)**
www.cmu.edu/cnast/

**Health Care Cost Institute**
www.healthcostinstitute.org/

**Institute for Complex Engineering Systems**
www.ices.cmu.edu

**Laboratory for the Study of Stress, Immunity and Disease**
www.psy.cmu.edu/~scohen

**Medical Robotics Technology Center (MRTC)**
medrobotics.ri.cmu.edu/

**Molecular Biosensor and Imaging Center**
www.mbic.cmu.edu

**Pittsburgh Mind-Body Center**
www.pghmbc.org/

**Pittsburgh Nuclear Magnetic Resonance Center for Biomedical Research**
www.cmu.edu/nmr-center

**Pittsburgh Supercomputing Center**
www.psc.edu

**Pittsburgh Tissue Engineering Initiative**
www.ptei.org

**Quality of Life Technology Engineering Research Center**
www.qolt.org/

**Ray and Stephanie Lane Center for Computational Biology**
lane.compbio.cmu.edu/

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**Carnegie Mellon University**

Carnegie Mellon University is a private, internationally ranked research university with programs in areas ranging from science, technology and business, to public policy, the humanities and the fine arts.

More than 12,000 students in the university’s seven schools and colleges benefit from a small student-to-faculty ratio and an education characterized by its focus on creating and implementing solutions for real problems, interdisciplinary collaboration and innovation.

A global university, Carnegie Mellon’s main campus in the United States is in Pittsburgh, Pennsylvania. It has campuses in California’s Silicon Valley and Qatar, and degree granting programs in Africa, Asia, Australia, Europe, and Latin America.

www.cmu.edu
Carnegie Mellon University does not discriminate in admission, employment, or administration of its programs or activities on the basis of race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status, or genetic information. Furthermore, Carnegie Mellon University does not discriminate and is required not to discriminate in violation of federal, state, or local laws or executive orders. Inquiries concerning the application of and compliance with this statement should be directed to the vice president for campus affairs, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, telephone 412-268-2056.

Carnegie Mellon University publishes an annual campus security and fire safety report describing the university’s security, alcohol and drug, sexual assault, and fire safety policies and containing statistics about the number and type of crimes committed on the campus and the number and cause of fires in campus residence facilities during the preceding three years. You can obtain a copy by contacting the Carnegie Mellon Police Department at 412-268-2323. The annual security and fire safety report is also available online at www.cmu.edu/police/annualreports.

For more information regarding the statement of assurance please visit:
www.cmu.edu/policies/documents/SoA.html