



# Master of Science Program In Biomedical Engineering

Department of Biomedical Engineering  
**New Jersey Institute of Technology**

## **New Jersey Institute of Technology**

NJIT set its root 125 years ago in the industrial powerhouse that was 19<sup>th</sup> century Newark and has grown into a major technological university poised to advance into the 21<sup>st</sup> century. NJIT's modern campus sits at the heart of Newark's revitalized University Heights, surrounded by the New Jersey Medical School, New Jersey Dental School, and the Newark campus of Rutgers University.

Graduate study greatly influences the academic environment of the campus, with 3500 out of NJIT's total 9000 enrollment pursuing the MS or Ph.D. On campus research has grown rapidly from a nominal level in the 1990s to over \$78 Million annually. Combining this with the research programs at the Medical and Dental schools and Rutgers-Newark, NJIT and its neighboring institutions comprise a robust research community approaching \$200 million/year.



## **Newark/New York City Metro Area**

Few regions of the nation rival the Newark/New York City metropolitan area for its exciting cultural, entertainment and employment opportunities. Within minutes of NJIT's campus are the NJ Performing Arts Center, the soon to be opened Newark Arena for professional hockey and basketball, and the Newark Ironbound, a neighborhood with dozens of Portuguese and Brazilian restaurants. Nearby communities offer an amazing ethnic richness that should appeal to graduate students. Only 30 minutes away, connected by excellent public transportation, NYC awaits with its theaters, performance halls, and matchless attractions.

For a closer look at the NJIT campus and the city of Newark take an online tour at <http://www.njit.edu/about/visiting/index.php> and <http://gonewark.com/>

## **MS in Biomedical Engineering at NJIT**

The biomedical engineering department at NJIT offers one of the most flexible MS curricula in the nation. Rather than require a one-size-fits-all common core set of courses, it recognizes that few students have the same background and even fewer have the same career goals. With one of the largest BME MS enrollments in the nation, the department is able to offer an outstanding selection of courses that allow students to develop an individual concentration of courses that support their personal career aspirations. This allows an individual to avoid taking courses that repeat material from their undergraduate education, while focusing their entire MS experience on acquiring depth in their area of specialization.

The department of biomedical engineering is NJIT's newest academic department and is staffed by faculty who are energetic in their teaching and research. NJIT's location close to world-class medical research institutions as well as one of the nation's most active biomedical industrial communities provides access to professors of practice who bring their personal expertise to courses that expand the curriculum.

The MS in BME can be earned with 30-credits (including a 6-credit thesis) or 30 credits (courses only). Many research oriented students pursue a thesis in one of the department's many faculty research laboratories or at a nearby medical research institution. A large number of non-thesis students pursue an internship in a biomedical industry

While the majority of students are full-time, part-time students are most welcome and will find a strong selection of late afternoon and evening courses available. Visit the department website at <http://biomedical.njit.edu/>

## Graduate Courses Offered in BME at NJIT

### Fall 2007

- INTRODUCTION TO BIOMECHANICAL ENGINEERING
- ENGINEERING PHYSIOLOGY
- BIOMECHANICS AND CONTROL OF HUMAN MOTION
- BIOMATERIALS
- NEUROMUSCULAR ENGINEERING
- MEDICAL IMAGING
- ADVANCED CAD OF PROSTHETIC DEVICES
- ADVANCED TOPICS IN BIOMATERIALS
- CAD FOR BIOMECHANICS AND BIOMATERIALS
- COMPUTER METHODS IN BIOMECHANICS
- INTRODUCTION TO BIOMEMS AND MICROFLUIDICS
- ADVANCED CHARACTERIZATION OF BIOMATERIALS
- COMPUTATIONAL BIOMECHANICS
- ANALYTICAL COMPUTATIONAL NEUROSCIENCE
- PRINCIPLES OF PHARMACOKINETICS & DRUG DELIVERY
- INSTRUMENTATION FOR PHYSIOLOGICAL MEASUREMENTS

### Spring 2008

- PRINCIPLES OF TISSUE ENGINEERING
- NEURAL ENGINEERING
- ENGINEERING PHYSIOLOGY
- INTRO TO BIOMECHANICAL ENGINEERING
- MEDICAL INSTRUMENTATION
- CELL & MOLECULAR TISSUE ENGINEERING
- BIOMEMS DESIGN AND RESEARCH
- BIOROBOTICS
- CAD FOR BIOMECHANICS & BIOMATERIALS
- CAD FOR ORTHOPEDIC DEVICES
- CARDIOVASCULAR MECHANICS
- NEUROREHABILITATION
- INTRO TO EMBEDDED SYSTEMS DESIGN
- COMPUTATIONAL BIOMECHANICS
- BIOMEDICAL SIGNAL PROC & DATA ACQUISITION
- MEDICAL IMAGE PROCESSING
- BIOSTATISTICS
- VIRTUAL BIOMEDICAL INSTRUMENTATION
- ORTHOPEDIC MEDICAL DEVICES

The above lists reflect courses taught for fall 2007 and spring 2008. The courses for fall 2008 semester will closely resemble those of the fall 2007, with the addition of several new courses. Prospective students can view current course enrollments and availability at the NJIT Registration website at <http://www.njit.edu/v2/registrar/>. Additional courses are available through **cross-registration with NJ Med and Rutgers Newark**.

### Research and Internships

Within the NJIT biomedical engineering department, research expenditures for the current year are approximately \$3 million. In addition, BME collaborates in research with institutions such as the University of Medicine and Dentistry of NJ, the Children's Specialized Hospital, Kessler Rehabilitation Institute, the East Orange VA Medical Center, and the JFK Neuroscience Institute. Support comes from the NIH, NSF, NIDRR, the NJ Commission for Spinal Cord Research, the NJ Stem Cell Initiative, and industry. Recent MS theses can be seen at <http://www.library.njit.edu/etd/list-majors.cfm?d=Biomedical-Engineering>

Recent companies in which BME MS students have found internships include: Boston Scientific, Cyber Extruder, Datascope, Ethicon (Johnson & Johnson), Honda Motors, Integra LifeSciences, Medtronic, Picatinny Arsenal, Respronics Asthma & Allergy Div, Schering-Plough, Stryker Orthopedics, Supertron Technologies, Wyeth, Vyteris, Biomerix.

### MS Students in BME at NJIT

Approximately 75% of the current students enrolled in the program are full-time and expect to complete their degree in 3 semesters. The cohort that enrolled in the fall of 2006 was academically the strongest in recent history. Both US and international students were strongly represented. Domestic students came from 21 different universities including, Johns Hopkins, Carnegie Mellon, Northwestern, Rochester, Syracuse, Boston Univ., Tufts, RPI, SUNY Buffalo, Manhattan, University of Virginia, Toledo, Univ. of Texas (Austin), Univ. of Texas (Arlington), Lehigh, Louisiana Tech, Northeastern, Iowa State, Rutgers and NJIT. International students came from excellent foreign universities, including a Fulbright Scholar.

For US applicants, favorable consideration will be given to those who have proven themselves academically in undergraduate courses and must provide a supporting letter of recommendation. GRE scores are not required for domestic applicants. International students should have a strong academic record with GRE quantitative > 730 and verbal >430, and TOEFL >85.

Further details about applying can be obtained online at <http://www.njit.edu/admissions/graduate/index.php>

### More Information

Those interested in obtaining additional information may view the MS in BME Program description at <http://catalog.njit.edu/graduate/programs/biomedicaleng.php>. Telephone, email and on-campus visits are welcomed. Please feel free to contact Max Roman, Ph.D., BME MS Program Coordinator, [max.roman@njit.edu](mailto:max.roman@njit.edu) or 1-973-596-5270