# Biomedical Engineering
## AT RUTGERS

**While medical doctors may administer procedures that save lives and keep people healthy, biomedical engineers are inventing the devices and equipment that drive medical advances and directly improve the quality of life for millions of people. Biomedical engineers design prostheses, artificial organs, and pharmaceutical products. They also design and manufacture diagnostic and therapeutic devices and imaging equipment that give doctors and medical researchers the tools to identify and treat a wide range of illnesses and injuries.**

Biomedical engineering at Rutgers offers exceptional opportunities for the intellectual development, personal growth, and success of students in an environment of diversity and vibrancy. As part of a nationally acclaimed research university, BME students have access to state-of-the-art labs and facilities, research opportunities, and co-op internships that compliment coursework and provide industry experience in preparation for a biomedical career.

The broad education allows students to choose from a wide variety of careers in large and small corporations and state and federal institutions, as well as prepare for medical, dental, law, business, or academic careers.

### PROFESSIONAL OPPORTUNITIES

Medical device industry

Healthcare, rehabilitation, and human performance

Medicine, and physical/occupational therapy

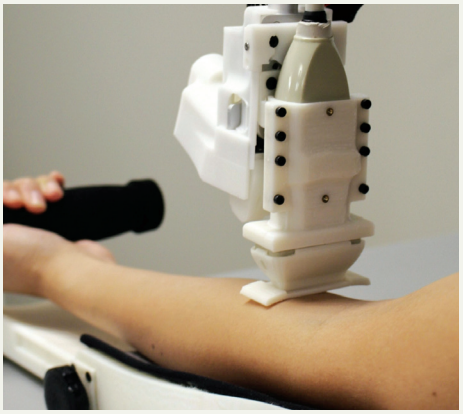
Tissue engineering, biomaterials design, and applications

Molecular medicine

Physiological systems

Medical imaging and processing

Medical or dental degree



**THE FUTURE IS NOW**

*An automated blood drawing device created by a Rutgers-led team includes an ultrasound image-guided robot that draws blood from veins, handles samples, and a centrifuge-based blood analyzer.*

### DEGREES OFFERED AND CURRICULAR OPTIONS

**BS**

*Options:*

Biomedical Computing, Imaging, and Instrumentation

Biomechanics and Rehabilitation Engineering

Tissue Engineering and Molecular Bioengineering

BS/MS Five-year Dual Degree

BS/ME Five-year Dual Degree

BS/MBA Five-year Dual Degree

BS/MBS Five-year Dual Degree

**MS**

**ME**

**PhD**

For more information, visit
bme.rutgers.edu

***"Rutgers engineering truly prepares students for any industry. We learn how to think critically, creatively solve problems, and become effective leaders."***
***Pearl Buccine***

RUTGERS
School of Engineering

Established in 1864, Rutgers University's School of Engineering is a vibrant academic community whose richly diverse students and faculty members are committed to globally sustainable engineering. Its mission is built on a commitment to fostering the integration of education and research to achieve transformational innovation that is ethically responsible. With seven academic departments representing key engineering disciplines, the School of Engineering is recognized around the world as comprehensive and leading-edge, training the next generation of innovators across a broad spectrum of professions.

# Biomedical Engineering at Rutgers

## PROGRAM HIGHLIGHTS

The undergraduate curriculum includes engineering, physics, chemistry, mathematics, and basic biology, as well as a solid core of basic biomedical engineering courses, numerous electives, a well-designed laboratory experience, summer industrial internships, and a capstone senior design project. Targeted degree options include tissue engineering and molecular bioengineering; biomedical computing, imaging, and instrumentation; and biomechanics and rehabilitation.

Flexibility in the curriculum allows students to pursue pre-medical and pre-dental studies. Other opportunities include a specialized honors program for students interested in pursuing a career in research.

## HANDS-ON ACTIVITIES

State-of-the-art facilities and an open lab design encourage interdisciplinary collaboration in genomics and proteomics, tissue engineering, advanced microscopy, biomedical optics, microfabrication, animal study, and high-performance computing.

The unique BME Co-operative Education Program provides undergraduates the opportunity to complete a six-month, experiential paid co-op with companies that have included Celgene, Merck, and Orthobond.

## COURSES OFFERED

**Biomechanics**

**Biomaterials**

**Biomedical Transport Phenomena**

**Kinetics and Thermodynamics of Biological Systems**

**Biomedical Devices and Systems**

**Biomedical Engineering System Physiology**

## RESEARCH FACILITIES AND CENTERS

**BioMEMS and Microfabrication**

**Stem Cell Biology and Bioengineering**

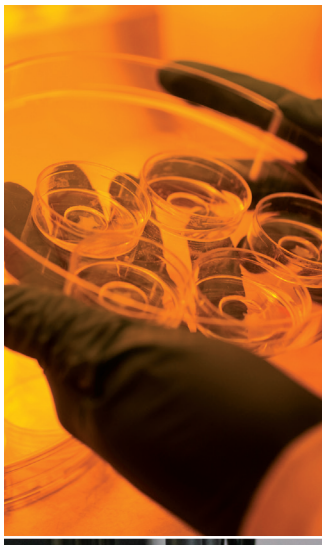
**Biomechanics and Rehabilitation Engineering**

**Nanomedicine and Molecular Systems Bioengineering**

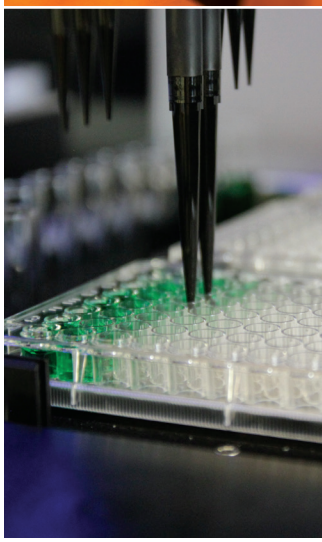
**Musculoskeletal Tissue Regeneration**

**Nanomaterials Laboratory**

**Prof. Joseph Freeman** was awarded a patent for his technology developed to create **three-dimensional pre-vascularized scaffold for bone regeneration** to improve outcomes of orthopaedic surgeries. The scaffolds may be seeded with the patient's own stem cells before implantation to improve bioactivity and tissue regeneration.



**Prof. Adam Gormley** developed an automated way to develop polymers. The innovation is a critical step in pushing the limits for researchers who want to explore large libraries of polymers for chemical and biological applications such as drugs and **regenerative medicine, tissue engineering, and more.**



**Watch this space.** **Biomedical engineering students immersed themselves at a school for children and adults with cerebral palsy, spina bifida, and other developmental disabilities. The students' goal: find ways to improve their independence and quality of life. After talking with staffers and students, students designed and demonstrated prototypes.**