



# Biomedical Engineering



## About the VCU College of Engineering

The VCU College of Engineering, an innovation front-runner in academics and research, brings real-world education to Central Virginia. Our collaborative and multidisciplinary partnerships prepare undergraduate, master's and doctoral students for leadership. Part of a premier research university, the VCU College of Engineering enhances regional and global prosperity through cutting-edge developments in tissue engineering, drug delivery, bioinformatics, cybersecurity, mechanical systems and particle science. We make it real by turning great ideas into breakthrough technologies. Our facilities are hubs of discovery, powered by an expanding student body and faculty committed to excellence. We encourage partnering with industry and the community, bringing new collaborators into our projects. Our key research areas include: sustainability and energy engineering; micro and nano electronic systems; pharmaceutical engineering; mechanobiology and regenerative medicine; big data mining and device design and development.

[biomedical.egr.vcu.edu](http://biomedical.egr.vcu.edu)

Application Deadline: **January 15**

For Scholarship Consideration: **November 15**

VCU College of Engineering  
601 West Main Street  
Richmond, Virginia 23284-3068  
(804) 828 - 3925  
askengineering@vcu.edu



"I want our program to be the **program of choice** for students considering undergraduate and graduate biomedical engineering in the commonwealth."

- Henry J. Donahue, Ph.D.,  
Department Chair

## About

Biomedical engineering is the application of engineering, technology and scientific concepts to solve biomedical problems and engineering challenges. The VCU Department of Biomedical Engineering program was founded in 1984, making it one of the first such programs in Virginia. The department offers an undergraduate program leading to a B.S. and a graduate program leading to an M.S. and Ph.D.

The Department of Biomedical Engineering maintains a close relationship with the VCU Medical Center, one of the country's leading academic medical centers. Areas of research include mechanobiology, tissue engineering, regenerative medicine, stem cell biology, biomaterials, bioimaging, computational physiology and rehabilitation and human factors engineering. Through VCU Engineering's interdisciplinary and convergent approach, students are educated to make a profound difference in bioengineering, biomedicine and their global community.

Inventing tomorrow's health care: creating the technologies that **improve — and save — lives.**



**VCU** College of Engineering



# Regenerative Medicine

Seeking to promote healing and regeneration of tissues, experts in the Department of Biomedical Engineering focus on musculoskeletal regeneration, biomaterials and stem cell engineering. Specialty areas include bone and cartilage, craniofacial tissue, skeletal muscle and immune tissue engineering.

# Mechanobiology

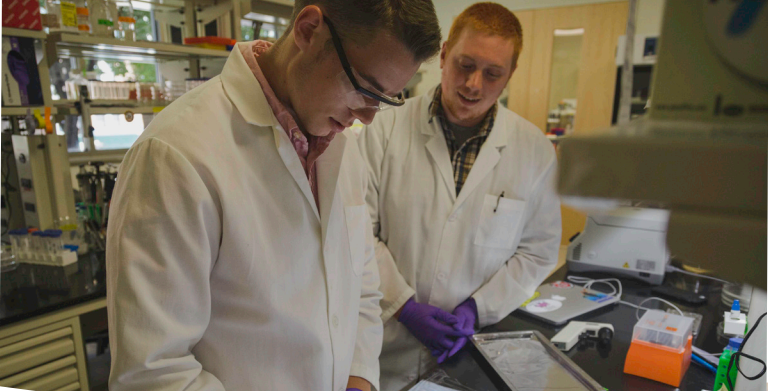
Several faculty members collaborate across their areas of expertise including cell-matrix mechanobiology, cellular biomechanics and computational physiology. Labs focus on the mechanobiology of musculoskeletal disease, mechanobiology of cancer and pulmonary mechanobiology.

# Rehabilitation Engineering

Faculty members are designing and developing devices and systems to help improve the lives of patients including older adults, those who are blind or have spinal cord injuries. Areas of focus include assistive technology for people who are blind or visually impaired, elderly patients and caregivers, hand prostheses, haptics and neuromusculoskeletal biomechanics of human movement.

# Bioimaging

Faculty members are using innovative MRI approaches to study cardiovascular disease and the neural basis of addictive behavior.



# Degrees

## Bachelor of Science

The B.S. in biomedical engineering provides students with a hands-on practical and experiential learning experience. A multitude of tracks for advanced study are available, including participation on medical and clinical rounds throughout VCU hospitals and access to state-of-the-art research labs.

## Master of Science

An M.S. in biomedical engineering provides opportunities for in-depth research and specialization in a variety of areas including biomedical imaging systems, orthopaedic biomechanics, tissue and cellular engineering, biomaterials, human-computer interfaces, cardiovascular devices and rehabilitation engineering.

## Doctor of Philosophy

The Ph.D. program in biomedical engineering provides doctoral students the opportunity for an extensive understanding of multidisciplinary research teams. With access to VCU's ongoing collaborations with numerous industries, federal labs and other centers and clinical programs, Ph.D. students gain a keen appreciation of the knowledge necessary to achieve lifelong learning and career development.



- National Institutes of Health
- National Science Foundation
- NASA
- U.S. Department of Defense
- Michael J. Fox Foundation
- American Heart Association
- American Federation for Aging Research
- National Institute of Standards and Technology

**"Making a difference** for humankind is at the heart of our research programs."

- Barbara D. Boyan, Ph.D.,  
College Dean