

Cornell Engineering

Nancy E. and Peter C. Meinig School of Biomedical Engineering

UNDERGRADUATE DEGREE PROGRAM

If you have an interest in engineering problems related to issues of human health and performance, biomedical engineering (BME) is a burgeoning field worth considering. An integrated, interdisciplinary endeavor, BME bridges the engineering and medical fields to meet the 21st-century needs of biomedical-related industries focused on medical devices and pharmaceuticals. Biomedical engineers discover and apply engineering principles and methods to a wide array of problems in medicine. They diagnose and determine the biological origins of disease. They also design biocompatible and living materials, prostheses, surgical implants, artificial organs, controlled drug-delivery systems, and regenerative technologies to augment the healing process.

The mission of the B.S. program at the Meinig School of Biomedical Engineering is to train students in the practice of design, fabrication, and analysis of biomedical systems, devices, diagnostics, and therapeutics for issues related to human health. Specifically, our vision for biomedical engineering focuses on a quantitative approach to understanding biology across scales—from nanoscale and molecular levels to the whole body. The quantitative nature of our program distinguishes the major

**BREAK
THE RULES to
IMPROVE HUMAN
HEALTH**

BME REQUIRED COURSES

BIOMG 1350	Introductory Biology: Cell & Developmental Biology
BIOG 1500	Investigative Biology Laboratory
BTRY 3010 or CEE 3040	Biological Statistics I Uncertainty Analysis in Engineering
BME 2000/ ENGRD 2202	Biomedical Transport Phenomena
BME 2010	Physiology of Human Health & Disease
BME 2110	Biomolecular Thermodynamics
BME 2210	Biomaterials: Foundations & Application in Medicine
BME 2310	Biomedical Signals & Systems
BME 3010	Cellular Principles of Biomedical Engineering
BME 3020	Molecular Principles of Biomedical Engineering
BME 3030	Biomedical Instrumentation & Technology Fabrication
BME 4010	Biomedical Engineering Analysis of Metabolic & Structural Systems
BME 4020	Electrical & Chemical Physiology
BME 4080 + BME 4090	Biomedical Engineering Design I and II
ENGRD 2020	Statics & Mechanics of Solids

from traditional programs in biology, while the focus on human health is distinct from other programs in engineering that include the study of biological systems (e.g. biological, environmental, chemical and biomolecular engineering). Additionally, its focus on multiscale analysis of biological systems is a unique signature of Cornell Biomedical Engineering relative to programs at peer institutions.

As a BME student you will:

- develop a quantitative approach to understanding biology across length and time scales with a focus on human health;
- possess an intellectual and technical foundation for innovation confidence;
- produce robust products and decisions within highly variable, uncertain environments;
- be a self-directed, life-long learner that readily identifies and applies engineering principles to biological systems;
- engage your community at the interface of the physical and life sciences as it relates to the human condition.

The BME major prepares you to bridge the engineering and medical fields, resulting in highly-flexible career prospects with opportunities in manufacturing,

BIO MEDICAL ENGINEERING



SOME AREAS OF BME RESEARCH

bioactive materials design

body-on-a-chip

cellular imaging

living tissue engineering

micro- and nano-biotechnology

multi-scale systems modeling

physics of cancer

at universities, hospitals, government regulatory agencies and law firms, as well as the research facilities of companies and educational and medical institutions. Many graduates continue their studies in biomedical engineering in Masters of Engineering (M.Eng.) or Doctoral programs in a specific biomedical engineering concentration. A biomedical engineering major is also excellent preparation for entry into graduate study in medicine.

Opened in 2008, Weill Hall is the home of the Meinig School of Biomedical Engineering at Cornell. This \$162-million facility brings together Cornell's top ranked programs in the life sciences, providing an avenue for building research connections across departments as well as across campuses, thanks to the extensive teleconferencing facilities designed to strengthen our connections with Weill Cornell Medical College, our medical school located in New York City. Cornell's Veterinary College offers students a local opportunity to connect veterinary medicine and engineering.

As a BME major you will be part of a diverse community of life-long learners who are innovation confident, collaborative across disciplines, and community engaged. You will learn to be an intellectual and technical leader, ready to break the rules to advance human medicine and improve human health.

MASTER OF ENGINEERING DEGREE PROGRAM

Cornell's M.Eng. degree is a one-year program that builds on your undergraduate foundation, expanding your knowledge and enhancing your career options. The focus of an M.Eng. degree is on engineering practice and design; that is, putting engineering knowledge to work developing new tools to address real-world problems in health science, learning both how to engineer solutions to health science challenges as well as what to engineer in terms of a product's market viability. Our M.Eng. programs accomplish this through a combination of courses and a design project that ensure each student has broad knowledge as well as focused expertise in a particular area.

BME ELECTIVE COURSE SAMPLER

Molecular, Cellular & Tissue Engineering

BME 5830	Cell-Biomaterials Interactions
BME 5850	Current Practices in Tissue Engineering
CHEM 5430	Bioprocess Engineering

Biomedical Materials & Drug Delivery

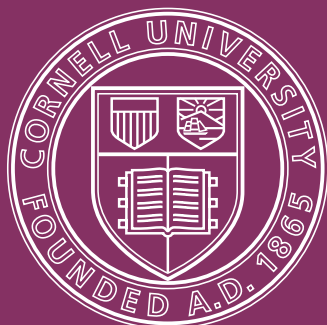
BEE 3650	Properties of Biological Materials
MSE 5620	Biomaterialization

Biomedical Imaging & Instrumentation

AEP 3300	Modern Experimental Optics
BEE 4590	Biosensors & Bioanalytical Techniques
ECE 4910	Principles of Neurophysiology

Biomedical Mechanics & Mechanobiology

MAE 4680	Biofluid Mechanics
MSE 5130	Mechanobiology of Materials & Cells
BME 5810	Soft Tissue Biomechanics



Cornell University is an equal-opportunity affirmative-action educator and employer. Produced by the Office of Engineering Admissions.

BME By the Numbers

BME undergraduate students	132
BME graduate students (M.Eng. only)	77

The Bureau of Labor Statistics lists the 2018 median pay as \$88,550.

bme.cornell.edu