The biological revolution of this century has given rise to a growing demand for engineers who can tackle local, national, and global challenges by combining the power of engineering principles and techniques with the constantly evolving science of biology. To solve the daunting problems confronting society today, engineers need strong math and science skills, effective communication abilities, and an appreciation for the scope and complexity of the challenges they are taking on.

If you have a strong aptitude for the sciences and math and an interest in solving engineering problems that relate to living systems, Biological Engineering (BE) at Cornell is definitely worth investigating. The field places you at the intersection of three great challenges facing humanity today:

- protecting and remediating Earth’s natural resources, including water, soil, air, and energy,
- ensuring an adequate and safe food supply in an era of expanding world population, and
- developing engineering systems that monitor or intervene in the mechanisms of living organisms.

You can focus your studies in biomaterials, nanobiotechnology, ecological and microbial systems, modeling and simulation, synthetic biology, molecular and cellular systems, and/or sustainability. You’ll take courses in basic and advanced biology, chemistry, mathematics, physics, computing, design, engineering applications, and fundamental engineering sciences (fluid mechanics, solid mechanics, thermodynamics, and transport processes).

Depending upon your interests, you’ll choose advanced BE courses in areas such as biomaterials, bioprocessing, bioinstrumentation, biotechnology applications, engineering ethics, computer-aided design, renewable energy systems, and watershed engineering. You’ll also select other courses in the College of Engineering that add strength to your academic concentration or allow you to pursue any of the 18 engineering minors open to BE undergraduates.

Planning to go to medical school? You will find an excellent fit between your required pre-med courses and the BE major. With proper planning, you can complete the biomedical minor at the same time.

<table>
<thead>
<tr>
<th>BEE CORE REQUIRED COURSES</th>
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<tr>
<td><strong>BEE 1510</strong> Introduction to Computer Programming or <strong>CS 1112</strong> Introduction to Computing Using MATLAB</td>
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<td><strong>BEE 2510</strong> Engineering for a Sustainable Society or <strong>BEE 2600</strong> Principles of Biological Engineering</td>
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<td><strong>BEE 3XXX</strong> Biomaterials</td>
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<td><strong>BEE 3310</strong> Bio-Fluid Mechanics</td>
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<td><strong>BEE 3500</strong> Biological and Bioenvironmental Transport Processes</td>
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<tr>
<td><strong>BEE 3600</strong> Molecular &amp; Cellular Bioengineering</td>
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<td><strong>BEE 4XXX</strong> Bioinstrumentation</td>
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<tr>
<td><strong>BIOG 1XXX</strong> Intro Bio Lecture + Lab and <strong>BIO 33XX</strong> Biochemistry or Microbiology</td>
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<tr>
<td><strong>ENGRD 2700</strong> Basic Engineering Probability &amp; Statistics or <strong>CEE 3040</strong> Uncertainty Analysis in Engineering</td>
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<tr>
<td><strong>CHEM 1570</strong> Introduction to Organic and Biological Chemistry or <strong>CHEM 3570</strong> Organic Chemistry for the Life Sciences</td>
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<tr>
<td><strong>ENGRD 2020</strong> Statics and Mechanics of Solids or <strong>ENGRD 2210</strong> Thermodynamics</td>
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<tr>
<td><strong>BEE 2220</strong> Bioengineering Thermodynamics &amp; Kinetics</td>
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SOME AREAS OF FACULTY RESEARCH

biological transport processes
biomaterials design
bioprocess engineering
bioremediation
biosensors and instrumentation
cellular engineering
controlled environment agriculture and aquaculture
ecosystem management and pollution control
environmental systems analysis
food processing engineering
international development
microbial fuel cells
microbial soil dynamics
nanoscale bioengineering
soil and water engineering
sustainable energy systems

BEE ELECTIVE COURSE SAMPLER

BEE 3299 Sustainable Development
BEE 3710 Physical Hydrology for Ecosystems
BEE 4010 Renewable Energy Systems
BEE 4530 Computer-Aided Engineering: Applications to Biological Processes
BEE 4550 Biologically Inspired Microsystems Engineering
BEE 4590 Biosensors and Bioanalytical Techniques
BEE 4600 Deterministic & Stochastic Modeling in Biological Engineering
BEE 4640 Bioseparation Processes
BEE 4730 Watershed Engineering
BEE 4740 Water and Landscape Engineering Applications
BEE 4750 Environmental Systems Analysis
BEE 4860 Industrial Ecology of Agriculturally Based Bioindustries
BEE 4870 Sustainable Bioenergy Systems
BEE 4880 Applied Modeling & Simulation for Renewable Energy Systems
BEE 4890 Entrepreneurial Management for Engineers
BEE 5330 Engineering Professionalism

The BE major places an emphasis on developing communication and teamwork skills. As an undergraduate, you may engage in undergraduate research, work as a teaching assistant, compete as a member of an engineering student-design team, complete an Engineering Co-op assignment in industry, or study abroad.

Graduates pursue career opportunities in private industry, public agencies, and educational institutions. Recent graduates are working in biotechnology companies that focus on food, energy and consumer products, environmental consulting, international projects, biomedical engineering and the pharmaceutical industry. Roughly one-third of the bachelor-level graduates pursue advanced study in engineering, science, business, or law.

The BE degree program is accredited by the Accreditation Board for Engineering and Technology (ABET) and graduates may become registered professional engineers through formal examination and professional employment.

BEE By the Numbers

Starting salaries of B.S. Biological Engineering graduates (for 2013)

Low $27,200
Median $62,000
High $79,000

Biological Engineering undergraduate students 203
College of Engineering 104
College of Agriculture & Life Sciences 99

Biological and Environmental Engineering graduate students 75

MASTER OF ENGINEERING DEGREE PROGRAM

The one-year Master of Engineering (M.Eng.) degree will prepare you to hit the ground running and stand out in the career of your choice.

The M.Eng. program in the Graduate Field of Biological and Environmental Engineering (BEE) is flexible, allowing candidates to select their courses and project area to meet their individual goals.

M.Eng. candidates in the field of BEE choose their design project and complete appropriate courses in one of the following areas: bioenergetics and stress factors, biomechanics, controlled-environment agriculture, energy systems engineering, engineering to solve global challenges, food process engineering, metabolic engineering, micro-bioreactors, microbial fuel cells, molecular engineering, nucleic acid engineering, physiological engineering, and soil and water engineering.

To learn more about this exciting program, please visit: www.engineering.cornell.edu/meng

www.bee.cornell.edu