Graduation Requirements

(Degree requirements apply to students matriculating in the fall semester of 2015 or later)

A student earning a Bachelor of Science degree in the Biological Engineering Program must complete the following academic requirements. A minimum of 126 credit hours of courses is required.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mathematics</td>
<td>16</td>
</tr>
<tr>
<td>2 Physics</td>
<td>8</td>
</tr>
<tr>
<td>3 Chemistry</td>
<td>7</td>
</tr>
<tr>
<td>4 Biological Sciences</td>
<td>15</td>
</tr>
<tr>
<td>5 Written Expression</td>
<td>6</td>
</tr>
<tr>
<td>6 Liberal Studies</td>
<td>18</td>
</tr>
<tr>
<td>7 Computer Programming</td>
<td>4</td>
</tr>
<tr>
<td>8 Engineering Distribution and Field Courses</td>
<td>46</td>
</tr>
<tr>
<td>8a Engineering Distribution Courses (7-8 Credits)</td>
<td></td>
</tr>
<tr>
<td>8b Biological Engineering Core Courses (22-24 credits)</td>
<td></td>
</tr>
<tr>
<td>8c Major approved Electives (4-5 courses from Biological Engineering Focus Areas)</td>
<td></td>
</tr>
<tr>
<td>9 Approved Electives</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
</tr>
</tbody>
</table>

Additional Requirements

- Technical Writing course
- Capstone Design course
- Laboratory course
- Physical Education course. Two semesters of physical education are required. All students must pass a swim test prior to graduation. Transfer students are exempted from one semester of PE for each full-time semester they transfer into Cornell.

Notes:

- All courses must be taken for letter grade (i.e., not S/U grade) except for Liberal Studies and Approved Electives
- Courses numbered 10XX, such as PHYS 1012, do not count toward graduation requirements.
- Academic Excellence Workshops (ENGRG 1091, 1092, 2093 and 2094) may not be used as Biological Engineering Electives.

Q1: Do I follow the previous curriculum or the current?

A1: Students matriculating in 2015 or later have to follow the new curriculum.
Q2: Is this curriculum for College of Engineering enrolled students or for students enrolled in College of Agriculture and Life Sciences?

A2: The university has only one undergraduate curriculum in Biological Engineering. The curriculum above is that one; it is jointly administered by the College of Engineering and the College of Agriculture and Life Sciences.

Q3: Is this curriculum accredited?

A3: Yes, this curriculum is accredited by ABET

Q4: Is this curriculum same as Biomedical Engineering?

A4: No.
Mathematics (16 credits required)

- **Calculus for Engineers I (4 credits):** MATH 1910
- **Calculus for Engineers II (4 credits):** MATH 1920
- **Engineering Math (Differential Equations) (4 credits):** MATH 2930
- **Engineering Math (Linear Algebra) (4 credits):** MATH 2940

Notes:

All math courses in this sequence must be completed with a grade of C- or better.

Q1: I have AP and/or transfer Credits. How do I get credit for those?
A1: Please see the page for AP and transfer credits for details

Q2: If I have AP/transfer credits, can I skip to the next Math course?
A2: Yes. Although we discourage from starting with Math 1920 even if you have credits for Math 1910, many students do this routinely. Of the students who do this, some have difficulty and have to switch back to Math 1910 while others do fine.
Physics (8 credits required)

Physics 1112 (Mechanics): 4 credits
Physics 2213 (Electromagnetism): 4 credits

Notes:
1. Physics need to be calculus based
2. Substitution with Physics 2208 and 2209 is possible but petition is required. See contact page
Chemistry (7 credits required)

**General chemistry (4 credits):** Chem 2070 or Chem 2090

**Organic Chemistry (3 credits):** Chem 1570, Chem 3530 or Chem 3570
Biological Sciences (15 credits required)

- **Introductory Biology (8 Credits):** Choose two of the following four courses: BIOMG 1350, BLOG 1440, BLOG 1445 or BIOEE 1610, plus BLOG 1500.

- **Biochemistry or Microbiology (3 or 4 credits):** Recommended courses are BIOMG 3300 or 3330 or BIOMG 3350 or BIOMG 3310+3320 or BIOMI 2900.

- **Advanced Biological Sciences (3 or 4 credits):** Any biology course at the 2000-level or above which has a biology prerequisite and is taken for a letter grade. This requirement may also be satisfied by

  - An upper-level course in a science department (excluding engineering, fine arts, liberal studies and mathematics) which has a biology (not social science) content of 95% or greater and a biology prerequisite. Students must receive approval for these alternative courses by consulting their BE faculty advisor or the main BE Advising Office.
  
  - Up to 4 credits of BLOG 4980 or 4990, but not BLOG 2990, if taken for letter grade.

  - One credit seminars may not be used to meet this requirement.

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**Notes**

- BLOG 1107/1108 can substitute for the introductory biology courses mentioned above but will need to complete at least 15 credits in the Biological Sciences category.

- All Bio courses must be taken for letter grade
Written Expression

- First Year Writing Seminars: 6 credits
- Technical Writing: See Technical Writing Course under Additional Requirements
Liberal Studies

Cornell has a rich curriculum in the humanities, arts, and social sciences, enabling every engineering student to obtain a truly liberal education. A minimum of six courses (totaling at least 18 credits) is required, and should be chosen with as much care and foresight as courses from technical areas. Details for Liberal Studies courses are listed here.
Computer Programming

Intro to Computer Programming – BEE 1510 or CS 1112
Engineering Distribution and Field Courses

(For new curriculum starting Fall 2015)

Engineering Distribution

- Solid mechanics: ENGRD 2020 (4 credits)
- Probability and Statistics: ENGRD 2700 (3 credits)/CEE 3040 (recommended, 4 credits)

Biological Engineering Core Courses

- The BEE Experience: BEE 1200 (1 credit) [Not required of students who have completed an ENGRI 1XXX course]
- Engineering Distribution: BEE/ENGRD 2600 (recommended) or BEE/ENGRD 2510 (3 credits)
- Thermodynamics: BEE 2220 or ENGRD 2210 (3 credits). [Students may petition to substitute CHEME 3130 (4 credits); MSE 3030 (4 credits); or AEP 4230 (4 credits).]
- Fluid Mechanics: BEE 3310 or CEE 3310 (4 credits) [Students may petition CHEME 3230 (3 credits).]
- Heat and Mass Transfer in Biological Engineering – BEE 3500 (3 credits)
- Molecular and Cellular principles in Biological Engineering: BEE 3600 (3 credits)
- Design and Analysis of Biomaterials: BEE 3400 (3 credits)
- Bioinstrumentation: BEE 4500 (3-4 credits)

Major-approved engineering electives (to complete 46 credits)

To complete the curriculum, electives are chosen depending on individual interests. For industrial careers, higher studies or professional studies, electives can be chosen from any of the biological engineering Focus Areas. Approximately 4-5 courses are picked from 1 or more of these focus areas to complete the 46 credits in the Engineering Distribution and Field Courses category. Additional notes for Major-approved Engineering Electives:

- A maximum of 4 credits of engineering research, project team, teaching or independent study may be used in this category.
- BEE/BME 5010 may be taken twice.
- One course in this category must satisfy Engineering Laboratory requirement. See Additional Requirements
- One course in this category must satisfy the capstone design requirement. See Additional Requirements
- One course in this category (or from specific Liberal Studies courses) must satisfy the College of Engineering Technical Writing requirement. See Additional Requirements

Notes:

- All courses must be taken for letter grade, except BEE/BME 5010
- BEE 2600 covers Mass and Energy Balances with a biological focus while BEE 2510 cover Mass and Energy Balances with an environmental focus
- Engineering distribution requirement is satisfied by ENGRD 2020 or ENGRD/BEE 2600 or ENGRD/BEE 2510
Approved Electives

(to be revised) These courses are selected by the student with approval of the student's Faculty Advisor.
Additional Requirements

Contents [hide]

- 1 Technical Writing Course
- 2 Capstone Design Course
- 3 Laboratory Course
- 4 Physical Education Course

Technical Writing Course

One course required. Approved technical writing courses are listed in the Courses of Study, College of Engineering section. Within our department, BEE 4530, BEE 4590, BEE 4730 and BEE 4890 are approved courses. This requirement may also be satisfied by specific liberal studies courses applied towards the liberal studies requirement.

Capstone Design Course

Select one course from BEE 4350, BEE 4500, BEE 4530, BEE 4590, BEE 4600, BEE 4730, BEE 4740, BEE 4810/4960, or BEE 4870.

Laboratory Course

Select one course from BEE 3650, BEE 4270, BEE 4500, BEE 4550, or CEE 4530.

Physical Education Course

Two semesters of physical education are required. All students must pass a swim test prior to graduation. Transfer students are exempted from one semester of PE for each full-time semester they transfer into Cornell.
A **sample** 8-semester plan. Yours will most likely be different. You can make schedule [here](http://blogs.cornell.edu/beadvised/sample-curriculum/).

<table>
<thead>
<tr>
<th>Fall Semester (All Fall courses)</th>
<th>Spring Semester (All Spring courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freshman Year</strong></td>
<td></td>
</tr>
<tr>
<td>MATH 1910, Calculus I</td>
<td>MATH 1920, Calculus II</td>
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<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>BEE 1510, Intro Computer Prog</td>
<td>PHYS 1112, Mechanics</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Intro Biology</td>
<td>Intro Biology</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>BLOG 1500, Bio lab</td>
<td>BEE 1200, The BEE Experience</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>First Year Writing Seminar</td>
<td>First Year Writing Seminar</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>16</td>
<td>15</td>
</tr>
</tbody>
</table>

| **Sophomore Year**               |                                      |
| MATH 2930, Differential Equations| MATH 2940, Linear Algebra            |
| 4                                | 4                                    |
| PHYS 2213, Electromagnetism      | CHEM 1570, Organic Chemistry         |
| 4                                | 3                                    |
| CHEM 2070 or 2090, Gen Chem      | BEE 2220, Biokinetics and Thermo     |
| 3                                | 4                                    |
| BEE 2510 or BEE 2600, Mass and Energy Balance | ENGRD 2020, Mech. of Solids |
| 3                                | 4                                    |
| Liberal Studies Elective         |                                      |
| 3                                |                                      |
| **Total**                        | **Total**                            |
| 15                               | 17                                   |

| **Junior Year**                  |                                      |
| 3                                | 3                                    |
| BEE 3310, Bio-Fluid Mechanics    | BEE 3400, Des. and Anal. of Biomaterials |
| 4                                | 3                                    |
| BIOMG 3300, Biochemistry         | BEE 4500, Bioinstrumentation         |
| 4                                | 3/4                                  |
| CEE 3040, Uncertainty Analysis   | Biol. Sci. Elective, upper level     |
| 4                                | 3                                    |
| Liberal Studies Elective         | Liberal Studies Elective             |
| 3                                | 3                                    |
| **Total**                        | **Total**                            |
| 18                               | 15/16                                |

| **Senior Year**                  |                                      |
| 3                                | 3/4                                  |
| 3                                | 3                                    |
| Biol. Eng. Focus Area Elective   | Approved Elective                    |
| 3                                | 3                                    |
| Approved Elective                | Liberal Studies Elective             |
| 3                                | 3                                    |
| Liberal Studies Elective         |                                      |
| 3                                |                                      |
| **Total**                        | **Total**                            |
| 18                               | 12/13                                |
Focus Area 1: Molecular and Cellular Bioengineering

Contents [hide]

1 What is it?
2 How we use it?
3 Career possibilities
4 Courses to help you prepare

What is it?

Molecular and cellular bioengineering seeks to understand, and ultimately control, the cellular processes. Three interrelated subtopics focus on the cell—processes inside the cell, interactions among cells, and cellular response to the environment. Such understanding allows us to detect, quantify, analyze, simulate, redirect, and redesign biological entities.

How we use it?

We can apply the knowledge to study live animal bioreactors, design biosensors or lab-on-a-chip systems with applications to detection of pathogenic microorganisms, allergens, or carcinogens; to develop antimicrobial surfaces for plastics, textiles, food packaging and processing equipment; to produce and refine natural and recombinant products such as pharmaceuticals, fine chemicals and industrial enzymes.

Career possibilities

Industrial careers are available in development and manufacture of pharmaceuticals, fine chemicals and biologics, consumer products such as foods, cleaners and cosmetics, and renewable energy sources.

Courses to help you prepare

- BEE 3600-Cellular and Molecular Bioengineering
- BEE 4550-Biologically Inspired Microsystems Engineering
- BEE 4590 – Biosensors and Bioanalytical Techniques
- BEE 4640 – [Bioseparation Processes]
- CHEME 4010 – Molecular Principles of Biomedical Engineering
- CHEME 4020 – Cellular Principles of Biomedical Engineering
- BEE 7600 – Nucleic Acid Engineering
Focus Area 2: Nanobiotechnology

Contents [hide]
- 1 What is it?
- 2 How we use it?
- 3 Career possibilities
- 4 Courses to help you prepare

What is it?
Nanobiotechnology integrates nanoscale science and technology with biology. Nanobiotechnology uses nano-materials (such as nanoparticles) and nano-tools (such as fabrications and electron microscopies) to study biological processes and to solve biological problems. On the other hand, biology provides rich and unimaginable inspirations for engineers to create, starting from the nanoscale, novel materials, tools, and devices that will ultimately benefit our society.

How we use it?
Applications include Environment, Energy, Public Health, Biotechnology, Food and Agriculture, and Consumer Products. For example, we can apply nanobiotechnology as a tool to study nanoscale phenomena from DNA behavior to nanoparticle assembly to cellular functions. We can also use nanobiotechnology to develop additional tools to aid researchers in understanding our world from the nanoscale and up. Furthermore, we can employ nanobiotechnology to create new materials and devices for real-world applications.

Career possibilities
Career opportunities exist in the following industries: Materials science such as colloids, textiles, polymers, and particles; Biotech industry such as reagents, devices, diagnostics, and research tools; Medical and pharmaceutical industry such as drug development, drug delivery, formulations, and imaging; Environmental industry such as monitoring, control, and remediation; Energy area such as novel batteries, energy captures and storages; Food technologies such as quality control, sensing, and packaging. In addition, there are career opportunities as professional researchers at all research institutes including universities, federal and military laboratories, and dedicated research institutes.

Courses to help you prepare
- BEE 3600-Cellular and Molecular Bioeng.
- BEE 4550-Biologically Inspired Microsystems Eng.
- BEE 4590 – Biosensors and Bioanalytical Techniques
- BEE 7600 – Nucleic Acid Engineering
- ECE 4070 – Physics of Semiconductors and Nanostructures
- MAE 5240 – Physics of Micro and Nanoscale Fluid Mechanics
- ECE 5320 – Nano-Optics
- ECE 5350 – Semiconductor Physics
- MSE 5630 – Nanobiotechnology
- CHENE 5940 – Biomolecular Eng. Logic and Design
- MSE 5890 – Colloids and Colloid Assemblies for Advanced Materials Applications
Focus Area 3: Ecological and Microbial Systems

Contents

1 What is it?
2 How we use it?
3 Career possibilities
4 Courses to help you prepare

What is it?

Ecological and microbial systems involve the interactions of species with each other and with their environment. The interactions may be affected by environmental contaminants and/or may be used by humans for productive purposes.

How we use it?

Large-scale microbial processes such as composting use mixed cultures in stable or sequential consortia determined by their environments. Even large industrial bioreactors producing enzymes, fuels and antibiotics effectively operate as ecologies rather than pure cultures due to genetic drift and low-level contamination. Biological processes in nature such as nitrogen fixation, and those designed by humans to work with nature such as habitat restoration, bioremediation, green walls for air, and integrated pest management, involve interactions among species ranging in scale from microbes to redwoods. Engineers focusing on microbial and ecological systems study these interspecies interactions, design them into systems which produce useful products and preserve the environment, and monitor ecosystems to preserve their stability in the face of population growth and climate change.

Career possibilities

Engineering careers in microbial and ecological systems may be found in hydroponics, biofuels, food processing, management of pests and invasive species, and sustainable waste processing including advances in composting and anaerobic digestion. Engineers in this area may develop microbial consortia to decompose contaminants or render them harmless, to promote plant growth and disease resistance, or to help replace chemical pesticides and herbicides. In future, the design, monitoring and construction of ecosystems will grow in importance as Earth and its multiple populations adjust to climate change and water scarcity.

Courses to help you prepare

- BEE 3299 Sustainable Development
- BEE 3710 Physical hydrology for Ecosystems
- BEE 4270 Water Measurement and Analysis Methods
- BEE 4750 Environmental Systems Analysis
- BEE 4760 Solid Waste Engineering
- BEE 4860 Industrial Ecology of Agriculturally Based Bioindustries
- BEE 4870 Sustainable Bioenergy Systems
- BEE 6570 Mixed-Culture Engineered Systems: Bioenergy and Microbial Ecology
- BEE 6580 Biofuels Topics
- BEE 6870 Science and Engineering Challenges to Development of Sustainable Bio-Based Industries
- BioEE 1610 Ecology and the Environment
- BioEE 3810 Advanced Ecology and 3611, Field Ecology
- BioEE 4780 Ecosystem Biology
- BioMI 3970 Microbial Ecology
- CSS 3970 Environmental Microbiology
- ENTOM 4730/HORT 4730: Ecology of Agricultural Systems
- FDSC 4600 Wine and Food Fermentations
- NTRES 4220 Wetland Ecology
Focus Area 4: Synthetic Biology

Contents [hide]

- 1 What is it?
- 2 How we use it?
- 3 Career possibilities
- 4 Courses to help you prepare

What is it?

Synthetic biologists approach the creation of new biological systems, focusing on finding how life works or how to use it to benefit society. It can be a biological approach such as inserting man-made DNA into a living cell or an engineering approach of building the new biological system as a platform for various technologies; and rewriting, rebuilding the natural systems to provide the engineered surrogates. One of the big challenges to engineering biological systems is that biology is both noisy and seemingly random. That is, biological systems don't always do things in a manner that is as predictable as an electrical circuit. However, biology has its own organizing principles and properties that Synthetic Biologists seek to exploit (or overcome) whenever possible: taking advantage of millions of years of evolutionary pressure that every biological system has at its functional core.

How we use it?

Many Synthetic Biologists are Genetic Engineers: changing genes in an organism (like a bacterium) or exchanging genes between organisms. Some of these Genetic Engineers also write computer codes to try and model and predict how gene expression will function in a complex environment. However, there are other Synthetic Biologists that make use of the unique properties found in biology like Watson-Crick base-pairing, connective tissue plasticity or biological adhesion to come up with designs that use these properties directly or mimic them to "borrow" their functionality. For SynBio (as the field is commonly called) it is always about gaining function.

Career possibilities

Industrial careers are varied and can include biotechnology companies, material design firms, drug companies, energy producers and consultants, patent lawyers and investment advisors. Synthetic Biology is still a very new field (except for the genetic engineering faction) and jobs are only starting to be more plentiful. Many of these jobs are invented as part of efforts to commercialize research developments in Synthetic Biology.

Courses to help you prepare

- BEE 3600-Cellular and Molecular Bioengineering
- BEE 4550-Biologically Inspired Microsystems Engineering
- BEE 4860 – Industrial Ecology of Agriculturally Based Bioindustries
- ECE 3530 – Introduction to Systems and Synthetic Biology
- CHME 5430 – Bioprocess Engineering
- CHME 5940 – Biomolecular Engineering Logic and Design
Focus Area 5: Biomaterials

Contents [hide]

- 1 What is it?
- 2 How we use it?
- 3 Career possibilities
- 4 Courses to help you prepare

What is it?

Biology provides great inspiration and building blocks for new material designs and engineering. On the other hand, materials need to be specially engineered in order to interface with biology. Together, the focus area of biomaterials encompasses elements of a variety of engineering fields including materials science and engineering, mechanical engineering, chemical engineering, and biomolecular engineering along with molecular biology, cell biology, medicine, etc.

How we use it?

Applications include Environment, Public Health, Biotechnology, and Consumer Products. For example, biomaterials can be used in a number of areas including biotech, pharmaceutics, medicine, and environment and also in many other applications that require materials either derived from or engineered for biology. In addition, biomaterials are being employed in environment remediation and replacing fossil-fuel based products.

Career possibilities

Career opportunities exist mainly in pharmaceutical and medical industry including drug delivery, drug formulation, tissue engineering, medical devices, diagnostic tools, etc.

Courses to help you prepare

- BEE 3600 - Cellular and Molecular Bioengineering
- BEE 3650 – Properties of Biological Materials
- BEE 4530 – Computer-Aided Engineering: Applications to Biomedical Processes
- BEE 4590 – Biosensors and Bioanalytical Techniques
- BEE 4600 – Deterministic and Stochastic Modeling in Biological Engineering
- MSE 4610 – Biomedical Materials and Their Applications
- MSE 5130 – Mechanobiology of Materials and Cells
- BME 5200 – Fundamentals of Biomaterials in Science and Engineering
- BME 5390 – Biomedical Materials and Devices for Human Body Repair
- MSE 5620 – Biomineralization: The Formation and Properties of Inorganic Biomaterials
- BME 5710 – Analytical Techniques for Material Science
Focus Area 6: Sustainability and Bioenergy

Contents [hide]

- 1 What is it?
- 2 How we use it?
- 3 Career possibilities
- 4 Courses to help you prepare

What is it?

Sustainability and Bioenergy refers to application of engineering and biology to provide basic services for human needs (water, soil, energy) and to manage waste flows in a manner that protects the environment and does not compromise the needs of future generations.

How we use it?

One can design new and improved processes to provide people with clean water and renewable energy. One can design new and improved systems to eliminate or manage waste streams from many sources (food processing waste, agricultural waste, human waste). Other applications include; detection and reduction of contaminants in the environment such as pesticides, heavy metals, and pathogens and biochemical processing of plant and animal materials to produce fuels and energy.

Career possibilities

Engineers working in these areas pursue careers as consulting engineers working in waste management, energy production and conservation and environmental stewardship. They may also function as environmental, energy, and sustainability specialists in corporations, and as public health engineers in health, education and safety agencies. Many engineers obtain graduate degrees in engineering, management, law, and planning.

Courses to help you prepare

- BEE 2220 Bioengineering Thermodynamics and Kinetics
- BEE 2510 Engineering for a Sustainable Society
- BEE 3299 Sustainable Development
- BEE 3500 Biological and Bioenvironmental Transport Processes
- BEE 4010 Renewable Energy Systems
- BEE 4760 Solid Waste Engineering
- BEE 4860 Industrial Ecology of Agriculturally Based Bioindustries
- BEE 4870 Sustainable Bioenergy Systems
- BEE 4880 Applied Modeling and Simulation for Renewable Energy Systems
- BEE 6570 Mixed-Culture Engineered Systems: Bioenergy and Microbiology
- BEE 7540 Water Management in an Era of Growing Water Scarcity
Focus Area 7: Systems and Computational Biology

Contents [hide]

- 1 What is it?
- 2 How we use it?
- 3 Career Possibilities
- 4 Courses to Help you Prepare

What is it?

Computational biology involves the application of mathematical modeling and computational simulation techniques to the study of biological systems. Thus, its applications can be very broad, covering many applications such as genomics, neuroscience, ecology and evolutionary biology, and biological systems in general. Systems biology focuses on complex interactions within biological systems. Its aim can be to model and discover properties of cells, tissues and organisms functioning as a system. Computational models are also helping attain the goals of systems biology.

How we use it?

At a smaller scale, systems and computational approach can help us understand and control phenomena within a cell with broad implications to plant and human systems. At a larger scale, it can help us understand how climate change will affect food production and ecosystems, and help design systems to remedy such effects. One can build models of evolutionary systems in order to predict changes that could occur in the future in areas such as disease susceptibility. Transmission of bacterial and viral outbreak can be better predicted and thus more effective preventive measures taken. Computer models of industrial food and bioprocesses will allow their design to be optimized better and faster for increased efficiency and sustainability.

Career Possibilities

Industrial career in bioprocess, food and medical industry can be in systems analysis, software development, process and product design, and device development. Many of these careers can also be appropriate for regulatory and research agencies such as FDA and NIH. Systems biology is a very active area of research where one can pursue higher studies. Likewise, computational biology higher studies can be in, for example, computational genomics, computational neuroscience, and cancer computational biology.

Courses to Help you Prepare

- BEE 4530 – Computer-Aided Engineering: Applications to Biomedical Processes
- BEE 4600 – Stochastic and Stochastic Modeling for Biological Engineering
- BEE 4860 – Industrial Ecology of Agriculturally Based Bioindustries
- BIOEE 3620 Dynamic Models In Biology
- BIOMG 6310 – Protein Structure and Function
- BME 3300 – Introduction to Computational Neuroscience
- BME 5400 – Biomedical Computation
- CHEM 5940 – Biomolecular Engineering Logic and Design
- CS 4220: Numerical Analysis: Linear and Nonlinear Problems
- CS 4820 – Introduction to Analysis of Algorithms
- ECE 3530 – Introduction to Systems and Synthetic Biology
- ECE 3200 – Networks and Systems
- MAE 3260 – System Dynamics
- ORIE 4350 – Introduction to Game Theory
- ORIE 4580 – Simulation Modeling and Analysis
- SYSEN 5100 Applied Systems Engineering