

Biological Engineering

ENGINEERING FOR HEALTH AND THE ENVIRONMENT

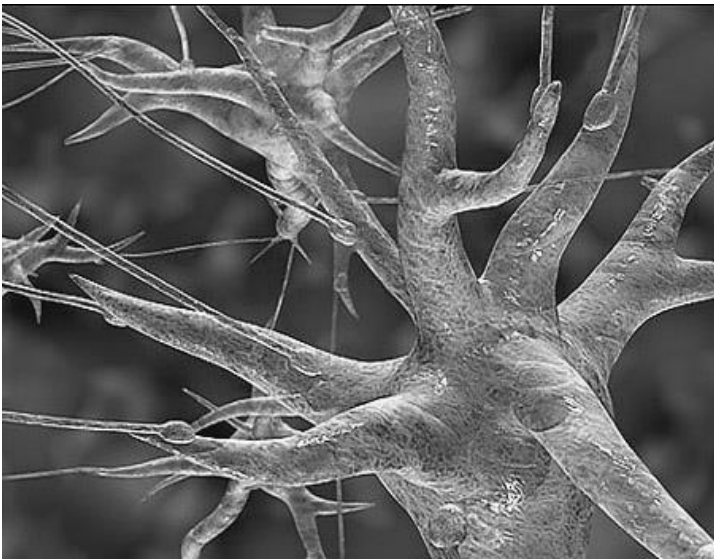
Academic Plan for 201

What can you do as a Biological Engineer?

Biological engineers integrate engineering principles with biological systems to develop new technologies and solutions to address societal needs. For example, biological engineers:

- improve environmental quality
- model impacts of climate on water supply & usage
- engineer bacteria to produce value-added products
- develop equipment to harvest and process food
- design and manufacture medical devices.

Given the diversity of the biological engineering discipline, biological engineers find themselves working in a variety of fields including bioprocessing, bioenergy, environmental, food production, agricultural, pharmaceutical, and biomedical. This diverse expertise makes biological engineers exceptionally valuable in today's challenging world.



Undergraduate Program

Courses in biology, chemistry, mathematics, and physics prepare you for more advanced courses in transport processes, bio-based products, bioenergy, biomedical engineering, bioprocessing, and sustainability.

Much of your education takes place in labs: explore water flow and quality and use in the water resources lab and the field, make discoveries about renewable energy in the advanced biofuel lab, design controls and instruments in the power lab, analyze medical images in the neurophysiology lab, and operate bioreactors in cell and tissue engineering lab.

As a biological engineering graduate, you will apply your technical expertise to solve engineering problems by designing components, processes, and systems. Graduates will communicate and work effectively in teams as well as have adequate knowledge in inorganic/organic chemistry, biochemistry, biological/biomedical science, and environmental science. Graduates will be able to apply their educational skills in a broad context related to an ever-changing world.

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Academic Plan for 2017/18

FRESHMAN - FALL			FRESHMAN - SPRING		
BE 142	Engineering for Living Systems	2	CHEM 112	Principles of Chemistry II	Chem 111 5
CHEM 111	Principles of Chemistry I <i>Chem 050 or sufficient test scores</i>	4	BIOL 115/ 115 Lab	Cells & the Evolution of Life	Chem 111 4
ENGL 102	College Writing and Rhetoric <i>English 101 or sufficient test scores</i>	3	MATH 175	Analytic Geometry & Calculus II	Math 170 4
ISEM 101	Integrated Seminar	3	ELECTIVE	Humanities/Social Science Elective	3
MATH 170	Analytic Geometry & Calculus I <i>Math 143 & 144 or sufficient test scores</i>	4			
	Total Credits	16		Total Credits	16
SOPHOMORE - FALL			SOPHOMORE - SPRING		
BE 242	Engineering Analysis & Design <i>Math 170, Math 175</i>	2	CHEM 277/278	Organic Chemistry (with lab)	Chem 112 4
BIOL 250/255	General Microbiology (with lab) <i>Chem 111</i>	5	ENGR 210	Engineering Statics	Math 170 3
PHYS 211/211Lab	Engineering Physics (with lab) <i>Math 170</i>	4	ENGR 240	Introduction to Electrical Circuits <i>Phys 211, Math 175</i>	3
MATH 275	Analytic Geometry & Calculus III <i>Math 175</i>	3	MATH 310	Ordinary Differential Equations <i>Math 175 (Math 275 recommended)</i>	3
ENGR 105	Engineering Graphics	2	PHYS 212	Engineering Physics II (no lab) <i>Phys 211, Math 175</i>	3
	Total Credits	16		Total Credits	16
JUNIOR - FALL			JUNIOR - SPRING		
STAT 301	Probability & Statistics <i>Math 175</i>	3	BE 462	Electrical Power and Controls <i>Engr 240, Math 310</i>	3
BIOL 380	Biochemistry I (no lab)	4	ENGR 350	Engineering Mechanics of Materials <i>Engr 210, Math 175, Math 310</i>	3
ENGR 320	Engineering Thermodynamics & Heat Transfer <i>Math 310, Engr 210 recommended</i>	3	ENGR 360	Engineering Economy <i>Jr. Standing</i>	2
ENGR 335	Engineering Fluid Mechanics <i>Math 275, Engr 210</i>	3	ELECTIVE	Humanities/Social Science Elective	3
ELECTIVE	Technical Elective	3	ELECTIVE	Engineering Elective	3
			COMM 101	Fundamentals of Public Speaking	2
	Total Credits	16		Total Credits	16
SENIOR - FALL			SENIOR - SPRING		
BE 478	Engineering Design I <i>BE 242, Engr 320, 335 & 350</i>	3	BE 479	Engineering Design II <i>BE 478</i>	3
BE 491	Senior Seminar <i>Sr. Standing</i>	1	BE 461	Bioprocess Engineering <i>Math 310, Engr 320 & 335</i>	3
BE 441	Instrumentation and Measurements <i>BE 462 recommended</i>	3	ELECTIVE	Humanities/Social Science Elective	3
ELECTIVE	Engineering Elective	3	ELECTIVE	Technical Elective	3
ELECTIVE	Engineering Elective	3	ELECTIVE	Technical Elective	3
ELECTIVE	Humanities/Social Science Elective	3	ISEM 301	Great Issues Seminar	1
	Total Credits	16		Total Credits	16

Courses in gold are prerequisites Courses in italics are co-requisites

A minimum grade of C must be earned in all engineering, mathematics, and science courses used to satisfy the curriculum.

See course catalog for complete degree requirements and additional information.

revised 7/2017