

BIOLOGICAL AND ECOLOGICAL ENGINEERING GRADUATE MAJOR (MENG, MS, PHD)

Graduate Areas of Concentration

Bio-based products and fuels, bioprocessing, biological systems analysis, ecosystems analysis and modeling, water quality, water resources

The Department of Biological and Ecological Engineering offers graduate programs leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees.

The Biological and Ecological Engineering program serves at the interface of life sciences and engineering. Bioresource engineering is the application of engineering and life science principles and problem-solving techniques to the optimum use and sustainability of biological resources. The curriculum is engineering-based with a strong emphasis on the life sciences. Courses focus on biological systems modeling, bioprocess engineering, thermophysical and molecular properties of biological materials, regional hydrologic analysis, groundwater systems, irrigation and water resource optimization. The department concentrates its research effort on two major thrusts: bioprocess engineering and water resources engineering. Specific research topics include biosensors, molecular-level biosystems analysis, nanosensors, microbial fuel cells, biological hydrogen production, and bio-based products and fuels. Research topics in water resources engineering include constructed wetland treatment systems, crop growth modeling, optimum irrigation management, crop-water requirements, groundwater and subsurface contaminant transport, hydrologic modeling, agricultural and ecological systems analysis, geographical information systems, artificial intelligence technologies, livestock production odor control, livestock waste treatment, and non-point source water pollution control.

For more information contact: Biological and Ecological Engineering Graduate Program, info-bee@oregonstate.edu, 541-737-2041.

Major Code: 4500

MEng

Code	Title	Credits
Required Core		
BEE 529	BIOSYS MODELING TECHNIQUES	3
Seminar		
BEE 507	SEMINAR	3
Electives		
Graduate Level Biological Science Courses (or science alternative) as approved by major professor		9-16
Additional Graduate Level Engineering Credits as approved by major professor		9-16
Project		
BEE 506	PROJECTS	minimum 6
Total Hours		45

MS

Code	Title	Credits
Required Core		
BEE 529	BIOSYS MODELING TECHNIQUES	3
Seminar		
BEE 507	SEMINAR	3

Electives		
Graduate Level Biological Science Courses (or science alternative) as approved by major professor		9
Additional Graduate Level Engineering Credits as approved by major professor		9-16
Thesis		
BEE 503	THESIS	21
Total Hours		45

PhD

Code	Title	Credits
Required Core		
BEE 529	BIOSYS MODELING TECHNIQUES	3
Seminar		
BEE 607	SEMINAR	3
Electives		
Graduate Level Biological Science Courses (or science alternative) as approved by major professor		12
Additional Graduate Level Engineering Credits as approved by major professor		12
Thesis		
BEE 603	THESIS	78
Total Hours		108

Prerequisite and Requisite Coursework for all BEE graduate degrees

Code	Title	Credits
<i>Calculus</i>		
One year, equivalent to:		
MTH 251	*DIFFERENTIAL CALCULUS	4
MTH 252	INTEGRAL CALCULUS	4
MTH 254	VECTOR CALCULUS I ¹	4
<i>Applied Differential Equations</i>		
One course, equivalent to:		
MTH 256		
<i>Calculus-based Physics</i>		
One year, equivalent to:		
PH 211	*GENERAL PHYSICS WITH CALCULUS	4
PH 212	*GENERAL PHYSICS WITH CALCULUS	4
PH 213	*GENERAL PHYSICS WITH CALCULUS	4
<i>Chemistry</i>		
One year, equivalent to:		
CH 201	CHEMISTRY FOR ENGINEERING MAJORS	3
CH 202	CHEMISTRY FOR ENGINEERING MAJORS	3
CH 205	LABORATORY FOR CH 202	1
CH 211	RECITATION FOR CHEMISTRY 201	1
CH 212	RECITATION FOR CHEMISTRY 202	1

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MTH 254 can be substituted with MTH 306

Major Code: 4500