



Biological & Ecological Engineering (BEE) Department

Colleges of Engineering and
Agricultural Science
bee.oregonstate.edu

Ecological Engineering

Undergraduate Advising Guide

2019-2020

Registration Dates

FALL TERM 2019

Priority registration runs **Sunday, May 19, 2019**
to **Thursday, June 6, 2019**

WINTER TERM 2020

Priority registration runs **Sunday, Nov 17, 2019**
to **Wednesday, Dec 4, 2019**

SPRING TERM 2020

Priority registration runs **Sunday, Feb 23, 2020** to
Wednesday, March 11, 2020



Gilmore Hall

124 SW 26th Street
(located at intersection of
Campus Way and 26th St.)

General questions? Please contact:

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Head Undergraduate Advisor

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<https://bee.oregonstate.edu/biological-and-ecological-engineering/advisors>

PREFACE

This advising guide is intended to give an overview of the requirements for the B.S. Ecological Engineering (EcoE) degree in the Biological & Ecological Engineering (BEE) department at Oregon State University (OSU). **This major requires 192 credits for graduation and generally takes 4-5 years to complete.**

This guide includes information about course prerequisites and sample term-by-term plans to graduate within 4 years. To create an individualized curriculum plan, log in to MyDegrees through MyOSU and utilize the Planner. **The use of Planner is required for all College of Engineering students.**

The information presented in this guide supplements information found in the 2018-2019 *OSU General Catalog* as well as in the *OSU Registration Information Handbook*. **It is the student's responsibility to be familiar with important dates, deadlines, regulations and rules detailed within these documents.** Please also carefully review the College of Engineering and the BEE Department policies for admission, student performance, and academic requirements.

Important Links:

- OSU General Catalog: <http://catalog.oregonstate.edu/>
- OSU Registration Information Handbook: <https://registrar.oregonstate.edu/how-register-registration-information-handbook>
- OSU Office of the Registrar webpage: <https://registrar.oregonstate.edu/>
- College of Engineering webpage: <https://engineering.oregonstate.edu/>
- Biological & Ecological Engineering webpage: <https://bee.oregonstate.edu/>

Campus Resources:

- Academic Success Center (ASC): <https://success.oregonstate.edu/>
- Admissions Office: <https://admissions.oregonstate.edu/>
- Counseling & Psychological Services (CAPS): <https://counseling.oregonstate.edu/>
- Degree Partnership Program (DPP): <https://partnerships.oregonstate.edu/>
- Disability Access Services (DAS): <https://ds.oregonstate.edu/>
- Diversity & Cultural Engagement: <https://dce.oregonstate.edu/>
- Financial Aid: <https://financialaid.oregonstate.edu/financial-aid>
- Human Services Resource Center: <https://studentlife.oregonstate.edu/hsrc>
- Scholarship Office: <https://scholarships.oregonstate.edu/>
- Student Care: <https://studentlife.oregonstate.edu/student-care>

DEFINITION OF ECOLOGICAL ENGINEERING

The EcoE degree at OSU is a unique, ABET-accredited degree that is the **first of its kind in the nation**. Ecological Engineering blends engineering and science, and focuses on the design of **sustainable systems** (natural, urban, and agricultural) that are **consistent with ecological principles** and **integrate human activities into the natural environment to the benefit of both**. This discipline is rapidly developing as an important new area of engineering. Graduates from our program are **creative and innovative problem-solvers**, and have found employment in water resources, irrigation design & management, river engineering, ecological restoration, water treatment, bioremediation, ecosystem modeling, and related fields.



CURRICULUM OVERVIEW

Ecological Engineering depends on a broader mix of disciplines than other branches of engineering. In addition to the traditional engineering training in **mathematics, physics, chemistry, and engineering principles**, underclassmen EcoE students receive training in **biology, ecology, soil science, geographic information systems (GIS), surveying, and environmental economics and policy**. Upperclassmen complete upper-division engineering coursework that includes **biosystems analysis and modeling, thermodynamics, fluid mechanics, hydrology and hydraulics, non-point source pollution, and bioremediation**. Upper division engineering and science electives (minimum of 23 credits) as well as a two-quarter senior capstone course are also required. In addition, students take credits to meet basic OSU requirements under the **Baccalaureate Core**, which emphasizes critical thinking, writing, world cultures, appreciation of differences, the arts, sciences, literature, lifelong fitness, and global awareness. **Graduation requires 192 credits.**

See pages 4-8 for an example 4 year plan and a more detailed breakdown of the curriculum.

Example 4 Year Plan (192 credits required)

Credits	First Year			Second Year			Third Year			Fourth Year												
	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring										
1	EcoE I BEE 101 F(3)	Speech COMM 111/114 FWS(3)	EcoE II BEE 102 S(3)	Biology BI 211 F(4)	Biology BI 212 W(4)	Biology BI 213 S(4)	Fluid Mechanics BEE 311 F(4)	Ecohydraulics BEE 312 W(4)	Ecohydrology BEE 313 S(4)	EcoE Design I BEE 469 F(4)	EcoE Design II BEE 470 W(4)	Nonpoint Source Pollution BEE 458 S(3)										
2	Chemistry CH 231 FW(4)	Chemistry CH 232 WS(4)	Chemistry CH 233 SF(4)										Statics ENGR 211 FWS(3)	EcoE Fundamentals BEE 221 W(3)	Strength of Materials ENGR 213 FWS(3)	Biosystems Analy. and Modelling BEE 320 F(4)	Thermo and Transfer Processes BEE 322 W(4)	EcoE Laboratory BEE 361 S(4)	BEE 415 F(1) Intro. Environ. Econ. & Policy AEC 250 FWS(3)	Bioremediation BEE 468 W(4)	Engineering Elective	
3																						CH 261 FW(1) CH 262 WS(1) CH 263 SF(1)
4				Differential Calculus MTH 251 FWS(4)	Integral Calculus MTH 252 FWS(4)	Vector Calculus MTH 254 FWS(4)	Physics w/ Calculus PH 212 FWS(4)	Physics w/ Calculus PH 213 FWS(4)	Technical Writing WR 327 FWS(3)	Ethics* IE 380 WS(3) or PHL 205 FWS(4)	Soil Science SOIL 205 FWS(3)	Science Elective										
5	English Composition WR 121 FWS(3)	Lifetime Fitness HHS 231+Lab FWS(3)	Physics w/ Calculus PH 211 FWS(4)										Statistics ST 314 FWS(3)	Ecology BI 370 FWS(3)	SOIL 206 FWS(1)	Science Elective	Science Elective	DPD Bacc. Core				
6																			Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core	
7				Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																
8	Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																			
9							Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core													
10				Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																
11	Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																			
12							Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core													
13				Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																
14	Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																			
15							Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core													
16				Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																
17	Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core																			
18							Perspective Bacc. Core	Synthesis Bacc. Core	Perspective Bacc. Core													

- Pre-requisite courses for upper-division coursework
 - Electives (21 total elective credits required; minimum 10 credits engineering electives; minimum 9 credits science elective)
 - Baccalaureate Core courses not covered by major requirements (S/U grading allowed)
- * IE 380 fulfills Science, Technology, and Society Bacc. Core; PHL 205 fulfills Western Culture Bacc. Core

This guide is intended for scheduling only. Course offerings and requirements are subject to change. Please refer to the OSU Online catalog for a complete list of degree requirements.

I. Required Courses (154 credits)

Math (23 credits)

Course #	Credits	Description	Prerequisites	Terms
MTH 251	4	Differential Calculus	MTH 112	FWS(Su)
MTH 252	4	Integral Calculus	MTH 251	FWS(Su)
MTH 254	4	Vector Calculus	MTH 252	FWS(Su)
MTH 256	4	Differential Equations	MTH 254	FWS(Su)
MTH 264	2	Introduction to Matrix Algebra	MTH 252	FWS(Su)
MTH 265	2	Introduction to Series	MTH 252	FWS(Su)
ST 314	3	Statistics for Engineers	MTH 252	FWS(Su)

Science (46 credits)

Course #	Credits	Description	Prerequisites	Terms
Bi 211	4	Principles of Biology	N/A	F(Su)
BI 212	4	Principles of Biology	CH 231/261	W(Su)
BI 213	4	Principles of Biology	CH 231/261	S(Su)
BI 370	3	Ecology	BI 211/212/213	FWS(Su)
CH 231/261	5	General Chemistry + Lab	MTH 111	FW(Su)
CH 232/262	5	General Chemistry + Lab	CH 231	WS(Su)
CH 233/263	5	General Chemistry + Lab	CH 232	FS(Su)
PH 211	4	General Physics with Calculus	MTH 252 (co)	FWS(Su)
PH 212	4	General Physics with Calculus	PH 211, MTH 252	FWS(Su)
PH 213	4	General Physics with Calculus	PH 212, MTH 254	FWS(Su)
SOIL 205/206	4	Soil Science + Lab	N/A	FWS

Science and Public Policy (3-4 credits)

Course #	Credits	Description	Prerequisites	Terms
AEC 250	3	Intro to Environ. Econ and Policy	MTH 111	FWS(Su)
or ECON 201	4	Intro to Microeconomics	MTH 111	FWS(Su)

Ethics (3-4 credits)

Course #	Credits	Description	Prerequisites	Terms
IE 380	3	The Responsible Engineer	Junior standing	WS
or PHL 205	4	Ethics	N/A	FWS(Su)

Engineering (56 credits)

Course #	Credits	Description	Prerequisites	Terms
BEE 101	3	EcoE I- Principles	N/A	F
BEE 102	3	EcoE II- Applications	N/A	S
BEE 221	3	EcoE Fundamentals	BI 211 + MTH 256	W
BEE 222	3	EcoE Computation	N/A	S
BEE 311	4	Ecological Fluid Mechanics	PH 212 + MTH 254 + ENGR 211	F
BEE 312	4	Ecohydraulics	BEE 311 or CE 311 or CHE 331	W
BEE 313	4	Ecohydrology	BEE 312	S
BEE 320	4	Biosystems Analysis and Modeling	BEE 222 + MTH 256	F
BEE 322	4	Thermodynamics and Transfer Processes	BEE 320	W
BEE 361	3	EcoE Laboratory	BEE 312	S
BEE 458	3	Nonpoint Source Pollution Assess. and Control	BEE 313 or CE 412	S
BEE 468	4	Bioremediation	BEE 221 or ENVE 322	W
BEE 469	4	EcoE Design I (WIC)	BEE 222	F
BEE 470	4	EcoE Design II (WIC)	BEE 469 (in same AY)	W
ENGR 211	3	Statics	MTH 252	FWS(Su)
ENGR 213	3	Strength of Materials	ENGR 211	FWS(Su)

Professional Skills (23 credits)

Course #	Credits	Description	Prerequisites	Terms
BEE 415	1	Professional Development	BEE 469 (co)	F
COMM 111/114	3	Public Speaking or Argument and Critical Discourse	N/A	FWS(Su)
ENGR 391	3	Engineering Econ. & Project Management	Sophomore standing	FWS(Su)
HHS 231+PAC	3	Lifetime Fitness for Health and Physical Activity Courses	N/A	FWS(Su)
FE 257	3	GIS and Forest Engineering Applications	N/A	W
FE 208	4	Forest Surveying	MTH 252	F
WR 121	3	English Composition	N/A	FWS(Su)
WR 327	3	Technical Writing	WR 121	FWS(Su)

II. Elective Courses (23 credits minimum)

Students are required to take a minimum of 23 credits of upper division science and engineering electives (minimum 9 non-blanket hour* science elective credits and minimum 10 non-blanket hour* engineering elective credits). **Pre-approved electives are listed in the Degree Checklist on MyDegrees and on the BEE advising webpage (link on bottom of Page 1).** If a science or engineering course is not included on the pre-approved lists, students may submit a program petition form (found on the BEE advising webpage- link on bottom of Page 1) to the Head Academic Advisor to receive approval to count it as an elective. This petition will be reviewed by the undergraduate curriculum committee. A maximum of two 200-level engineering electives and one 200-level science elective may be taken.

***Blanket hour credits (BEE 401, 405, 410)**

Blanket hour credits are taken by students completing undergraduate research (BEE 401), individualized study (BEE 405), or an internship (BEE 410). Just as with regular course credits, students are responsible for paying tuition for these credits. To receive blanket-hour credits, students must first **submit a blanket-hour credit form** to the Head Academic Advisor that is signed by their project supervisor and BEE faculty grader (if different person than project supervisor). They will then register for the credits and **submit a substantial report** to their supervisor and grader at the end of the term. More details on the requirements (as well as forms to be submitted) can be found here, <https://agsci.oregonstate.edu/biological-and-ecological-engineering/blanket-hour-courses>.

III. Baccalaureate Core (15 additional credits towards major)

OSU requires completion of a set of Baccalaureate Core ("Bacc Core") courses, divided into 4 groups- Skills, Perspectives, Synthesis, and Difference, Power, and Discrimination. Some of these categories are met by required courses within your major (*).

Skills (15 credits)

Course Category	Credits	Met by	S/U Allowed
Fitness*	--	HHS 231 + PAC	Yes
Mathematics*	--	MTH 251	No
Speech*	--	COMM 111 or 114	No
Writing I*	--	WR 121	No
Writing II*	--	WR 327	No

Perspectives (24 credits)

Course Category	Credits	Met by	S/U Allowed
Biological Science w/ Lab*	--	Biology or Soil Science courses	No
Cultural Diversity	3	N/A	Yes
Literature & Arts	3	N/A	Yes
Physical Science*	--	Chemistry or Physics courses	No
Social Processes & Institutions*	--	AEC 250	No
Western Culture*	3	PHL 205 (if taken)	Yes (No if PHL 205)

Synthesis (6 credits)

Course Category	Credits	Met by	S/U Allowed
Contemporary Global Issues	3	N/A	Yes
Science, Technology, and Society*	3	IE 380 (if taken)	Yes (No if IE 380)

Difference, Power, & Discrimination (3 credits)- No S/U grading

ADVISING

Advising Office Location:

116 Gilmore hall

Advisor:

Rachel Jones, Head Advisor

541-737-3759

rachel.jones@oregonstate.edu

Office Hours: Monday-Friday, 8:30am-12:30pm



Rachel Jones

Other Contact Information:

Jennifer Cohen, Office Manager

541-737-6292

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Cat Mullins, Administrative Program Assistant

541-737-2041

cat.mullins@oregonstate.edu



Jennifer Cohen



Cat Mullins

Advising Appointments:

Students are required to meet with their academic advisor **every term** in order to receive their registration PIN for the following term. Students should come prepared to these meetings with courses loaded in their MyDegrees planners. To schedule an appointment, please visit the BEE advising webpage (link on bottom of Page 1).

*First Year students (high school graduates with less than 24 quarter/16 semester college credits) will meet with an assigned College of Engineering First Year Advisor during their first academic year at OSU. Advisors are assigned alphabetically, based on last name. Please visit the First Year Advising webpage, <https://engineering.oregonstate.edu/advising/first-year-engineering-students>, for more information.

Late policy:

If a student arrives to a scheduled advising appointment 5 minutes or more late, they may be asked to reschedule. If a student arrives 10 minutes or more late, they must reschedule.

No-show policy:

There is no penalty for the first time a student does not come to a scheduled appointment. If the student fails to show for a 2nd appointment or more, they will not receive their PIN for registration until the final day of Phase I registration.