



Biological & Ecological Engineering (BEE) Department

Colleges of Engineering and
Agricultural Science
bee.oregonstate.edu

Ecological Engineering

Undergraduate Advising Guide

2020-2021

Registration Dates

FALL TERM 2020

Priority registration runs **Sunday, May 17, 2020**
to **Wednesday, June 3, 2020**

WINTER TERM 2021

Priority registration runs **Sunday, Nov 15, 2020**
to **Wednesday, Dec 2, 2020**

SPRING TERM 2022

Priority registration runs **Sunday, Feb 21, 2021** to
Wednesday, March 10, 2021



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 180 credits for graduation and generally takes 4 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 180 credits.**

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

Example 4 Year Plan (180 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	EcoE II	EcoE III	EcoE Ecology	EcoE Fundamentals	EcoE Comp.	Fluid Mechanics	Ecohydraulics	Ecohydrology	EcoE Design I	EcoE Design II	EcoE Design III											
2	BEE 101	BEE 102	BEE 103	BEE 270	BEE 221	BEE 222							BEE 311	BEE 312	BEE 313	BEE 481	BEE 482	BEE 483					
3	F(3)	W(3)	S(3)	F(3)	W(3)	S(3)	F(4)	W(4)	S(4)	F(4)	W(3)	S(2)											
4	Chemistry	Chemistry	Chemistry	Statics	Lifetime Fitness	Strength of Materials	Biosystems	Thermo and Transfer Processes	EcoE Laboratory	BEE 415	Bioremediation	Synthesis Bacc. Core											
5													CH 231	CH 232	CH 233	ENGR 211	HHS 231+Lab	ENGR 213	BEE 320	BEE 322	BEE 361	BEE 468	
6													FW(4)	WS(4)	SF(4)	FWS(3)	FWS(3)	FWS(3)	F(4)	W(4)	S(4)	W(4)	Engineering Elective
7																							
8	CH 261	CH 262	CH 263	Differential Equations	Statistics	Matrices	Forest Surveying	GIS	EcoE Microbial Processes	Engineering Elective	Engineering Elective	Engineering Elective											
9	FW(1)	WS(1)	SF(1)										MTH 256	ST 314	MTH 264	FE 208	BEE 362	BEE 362	BEE 362	BEE 362			
10	Differential Calculus	Integral Calculus	Vector Calculus	Physics w/ Calculus	Physics w/ Calculus	Technical Writing	Soil Sci + Lab	Science Elective	Science Elective	Science Elective	Perspective Bacc. Core	DPD Bacc. Core											
11	MTH 251	MTH 252	MTH 254										PH 213	PH 213	WR 327	SOIL 205/206	FE 257	BEE 362	BEE 362	BEE 362	BEE 362		
12																							
13	English Composition	Speech	Physics w/ Calculus	Intro. Environ. Econ. & Policy	Ethics*	Ethics*	Soil Sci + Lab	Science Elective	Science Elective	Synthesis or Perspective Bacc. Core	Perspective Bacc. Core	Perspective Bacc. Core											
14	WR 121	COMM 111/114	PH 211										AEC 250	AEC 250	SOIL 205/206	FE 257	BEE 362	BEE 362	BEE 362	BEE 362	BEE 362		
15	FWS(3)	FWS(3)	FWS(4)																				
16																							
17																							
18																							

- Pre-requisite courses for upper-division coursework
- Electives (23 total elective credits required; minimum 13 credits engineering electives; minimum 10 credits science elective)
- Baccalaureate Core courses not covered by major requirements (S/U grading allowed)
- * Fulfills either a Perspectives or Synthesis baccalaureate core category, dependent on course chosen

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 (142 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 (37 credits)

Course #	Credits	Description	Prerequisites	Terms
BEE 270	3	EcoE Ecology	N/A	F
BEE 362	3	EcoE Microbial Processes	N/A	S
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)
or PHL 440	3	Environmental Ethics	Sophomore standing	Su
Or PHL 443	3	World Views and Environmental Ethics	Sophomore standing	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	W
BEE 103	3	EcoE III- Computation	N/A	S
BEE 221	3	EcoE Fundamentals	BI 211 + MTH 256	W
BEE 222	2	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 468	4	Bioremediation	BEE 221 or ENVE 322	W
BEE 481	4	EcoE Design I (WIC)	BEE 222	F
BEE 482	3	EcoE Design II (WIC)	BEE 481 (in same AY)	W
BEE 483	2	EcoE Design III (WIC)	BEE 481 & 482 (in same AY)	
ENGR 211	3	Statics	MTH 252	FWS(Su)
ENGR 213	3	Strength of Materials	ENGR 211	FWS(Su)

Professional Skills (20 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)
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 10 non-blanket hour* science elective credits and minimum 13 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	PHL 440 or PHL 443 (if taken)	Yes (No if PHL 440 or PHL 443)
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:

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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.