



Department of
**BIOLOGICAL & ECOLOGICAL
ENGINEERING**

The Biological & Ecological Engineering department works at the intersections of humans and our environment, mediating the relationships that allow both people and planet to thrive. BEE specializes in systems approaches, creating balanced solutions to society's most pressing challenges linking our food, water, and energy systems. Combining an engineering approach with applications to resource management, BEE spans the College of Agricultural Sciences and the College of Engineering and launched the nation's first B.S. Ecological Engineering degree.

Degree Programs

Undergraduate

- B.S. Ecological Engineering
- Minor in Irrigation Engineering

Graduate

- Biological & Ecological Engineering | M. Eng. | M.S. | Ph.D.
- Water Resource Engineering | M.S. | Ph.D.
- Water Resource Science | M.S. | Ph.D.

Faces of AgSci



“ I liked the idea of applying math and science to mend and preserve the environment and I was attracted to the problem-solving part of engineering. Creating solutions that can lead to a better world was a big reason I wanted to become an engineer.

Katelin Godwin, BEE student

Read more at agsci.oregonstate.edu


Experiential Learning Opportunities

BEE is a relatively small department, enabling engagement of students with extensive hands-on learning opportunities as part of its curriculum. This close-knit learning community of students and teachers yields meaningful skills that are valued by industry with impactful solutions:

- The OPEnS lab employs more than 20 undergraduate students in designing and prototyping environmental sensing technologies, with funding from both federal agencies and private industry.
- Multiple start-up businesses have launched from BEE students extending research projects to commercialization.
- Undergraduate students are actively engaged in research projects spanning a host of food, water, and energy-system projects, with mentoring from faculty and graduate students.
- The Ecological Engineering Student Society conducts designs, builds, and conducts pilot-scale research, presently including an aquaponics study.

BIOLOGICAL & ECOLOGICAL ENGINEERING AT A GLANCE

19  Faculty

95  Undergraduate Students

20 Graduate Students

Research

2022 Research Expenditures: \$1,528,506

Research Focus Areas:

- Algal- & Bio-based fuels, products, & processes
- Microbial fuel cells
- River Engineering & Restoration
- Agricultural Water Management
- Precision Agriculture & Irrigation Management
- Hydrology & Water Resources Engineering
- Environmental Sensing & Sampling
- Watershed Management
- Climate Change Adaptation & Management
- Integrated Food-Energy-Water Systems

Extension Highlights

Extension specialists with BEE are statewide leaders in watershed management and agricultural water management and irrigation. Efforts focus on developing long-term partnerships and high-trust relationships with leaders in the agricultural and natural resource industries and nonprofit sectors. BEE's extension faculty work to provide scientific and technical advice while delivering actionable, understandable solutions to our partners.

With experts in watershed management, irrigation technology, groundwater management, and the integrated management of energy, water and food systems, extension specialists host hundreds of training sessions and workshops, building foundational partnerships with industry and communities throughout the state.

The Future of Biological & Ecological Engineering

Biological & Ecological Engineering works with nature, not in spite of it, to engineer solutions for society's most pressing ecological problems. The intersection of resource conservation and resource use is at the heart of BEE's research, teaching, and outreach with a long-view that works with the strengths of both nature and human ingenuity to improve the outcomes for both people and planet. As a relatively new discipline, the future of BEE is in making a measurable impact in the lives of people and the health of our ecosystems with a deep understanding of both complex engineering principles and the constantly changing nature of our natural resources. From agrivoltaics to critical water resource management, BEE embraces both the tangible and intangible, the known and unknown, to engineer balanced solutions that last. To further advance those efforts, BEE is actively developing graduate certificates in Water Resources Engineering and Water Resources Science to extend our educational footprint and serve water resource professionals worldwide via OSU's ECampus.

