Biological and Agricultural Engineering

ENVIRONMENTAL ENGINEERING OPTION

Develop equipment and systems that clean up pollution and protect the environment.

THIS MAJOR IS A GOOD FIT
IF YOU CAN SEE YOURSELF:

STUDYING math, biology, and physics

COMMUNICATING AND WORKING on teams that include environmental scientists, land managers, and industry experts

USING YOUR CREATIVITY and scientific knowledge to plan and build new devices and ways of doing things

This major will give you skills to design equipment and manage industrial processes that make efficient and sustainable use of natural resources. Learn to monitor groundwater quality, measure sediment levels, and treat waste. Develop ways to make biofuels from agricultural products, byproducts, and waste. Our faculty is currently researching many topics in environmental engineering. They are developing computer models to predict the effects of climate change on water availability in Idaho, treating polluted soil and aquifers using microbes, designing bioreactors that make natural gas from animal waste, tracing lead poisoning through the digestive tracts of native snow geese, and much more.

INSIDE THE CLASSROOM
Courses in math, chemistry, and microbiology prepare you for more advanced topics, including bioremediation, thermodynamics, and fluid mechanics. Much of your education takes place in labs. Experiment with how microbes break down hazardous waste in the bioremediation lab. Explore water quality and use in the water resources lab. Use state-of-the-art groundwater flow programs in the computing lab. Design a remote-powered water sampler in the instrumentation lab. Senior year, you will draw on everything you've learned to solve a real-world problem for an industry sponsor. You and your teammates might use microbes to break down paper pulp waste for Potlatch Corporation, or construct a rain chamber to test utility meters for Itron. Present your findings at the UI Engineering Expo.

OUTSIDE THE CLASSROOM

INTERN. Get practical experiences like these: U.S. BUREAU OF RECLAMATION Model scenarios for the effects of climate change on groundwater availability in Idaho . . . CORNELL UNIVERSITY Use earthworms to detect heavy metals in hazardous waste. . . . BERMUDA BIOLOGICAL STATION FOR RESEARCH Study the ocean's role in regulating Earth's climate.

STUDY ABROAD. Deepen your understanding of your major —and the world—in countries like these: SWEDEN Help design a sustainable student housing project . . . MEXICO Evaluate the function of absorbents in cleaning biodiesel . . . TAIWAN Reach speeds of 190 miles per hour on a bullet train.

DO RESEARCH. Make hands-on discoveries. Earn money working with faculty on grant-funded research. CENTER FOR HAZARDOUS WASTE REMEDIATION RESEARCH Analyze how microbes break apart hazardous compounds in soil and water . . . BIODIESEL EDUCATION GRANT Take part in one of many alternative-fuels research projects . . . WATERS OF THE WEST PROJECT Consult with lawyers and biologists to give them an engineer's perspective on real-world problems from pollution to drought.

FASTFACT

Our seniors built a rain chamber to see how utility equipment holds up when exposed to the elements.

GET INVOLVED. Network and have fun. AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS Join the student branch, plan parties, and meet business leaders and potential employers . . . TAU BETA PI Receive career assistance and leadership opportunities through the national honor society of engineers . . . SOCIETY OF WOMEN ENGINEERS Network and develop professionally.

CAREER OPPORTUNITIES
Our graduates are highly sought by government agencies, environmental consulting firms, and nonprofit organizations, with starting salaries of up to $60,000.

Here are a few possibilities:

RESEARCH ENGINEER. Test and refine new products. Conduct hazardous-waste management studies and design sustainable irrigation, waste-handling, and energy systems. Explore solutions to problems such as acid rain.

BIOREMEDIATION ENGINEER. Advise on environmental restoration. Visit sites to observe problems, consult with contractors, and monitor cleanup activities.

REGULATORY ENGINEER. Enforce environmental regulations. Advise on pollution treatment and containment.

PROJECT ENGINEER. Estimate the time and cost to complete projects. Monitor or direct operations such as gasoline spill cleanups.

COMBINE YOUR EDUCATION. A second language can open doors to international careers. Depending on your goals, take microbiology, hydrology, or other types of engineering courses.

CONTINUE YOUR EDUCATION. Earn an advanced degree in environmental engineering or public policy.

FIND OUT MORE ABOUT THE UNIVERSITY OF IDAHO BIOLOGICAL AND AGRICULTURAL ENGINEERING MAJOR

WWW.UIDAHO.EDU/CALS/BAE

BIOLOGICAL AND AGRICULTURAL ENGINEERING ENVIRONMENTAL ENGINEERING OPTION

4-YEAR PLAN 2012-13

	FRESHMAN		SOPHOMORE		JUNIOR		SENIOR	
FALL	**BAE 142** Engineering for Living Systems	2	**BAE 242** Engineering Analysis & Design	2	**Engr 320** Engineering Thermodynamics & Heat Transfer	3	**BAE 432** Bioreactor Theory and Design for Waste Management *or* **BAE 433** Bioremediation	3
	Chem 111 Principles of Chemistry I	4	**Chem 277/278** Organic Chemistry/Lab	4	**Engr 335** Engineering Fluid Mechanics	3	**BAE 478** Engineering Design I	3
	Engl 102 College Writing & Rhetoric	3	**Math 275** Analytic Geometry & Calculus III	3	**Engr 350** Engineering Mechanics of Materials	3	**BAE 491** Senior Seminar	1
	ISEM 101 Integrated Seminar	3	**MMBB 250/255** General Microbiology/Lab	5	**ISEM 301** Integrated Seminar	3	**CE 330** Fundamentals of Environmental Engineering	3
	Math 170 Analytic Geometry & Calculus I	4	**Phys 212** Engineering Physics II	3	**MMBB 380** Introductory Biochemistry	4	**Elective** Elective—BAE	3
					Elective Elective—Humanities or Social Science	3	**Elective** Elective—Humanities or Social Science	3
	TOTAL	**16**	**TOTAL**	**17**	**TOTAL**	**19**	**TOTAL**	**16**
SPRING	**Chem 112** Principles of Chemistry II	5	**Biol 115** Cells & the Evolution of Life	4	**BAE 355** Fundamentals of Hydrologic Engineering	3	****BAE 441** Instrumentation & Measurements	3
	Math 175 Analytic Geometry & Calculus II	4	**Engr 210** Engineering Statics	3	***BAE 462** Electric Power & Controls	3	**BAE 461** Bioprocess Engineering	3
	Phys 211/211L Engineering Physics I/Lab	4	**Engr 240** Intro. to Electrical Circuits	3	**Engr 105** Engineering Graphics	2	**BAE 479** Engineering Design II	3
	Elective Elective—Humanities or Social Science	3	**Math 310** Ordinary Differential Equations	3	**Engr 360** Engineering Economy	2	**Comm 101** Fundamentals of Public Speaking	2
			Soil 205 Soil Ecosystem	3	**Stat 301** Probability & Statistics	3	**Electives** (For example, BAE 452 Environmental Water Quality)	3
					Elective Elective—Humanities or Social Science	3		
	TOTAL	**16**	**TOTAL**	**16**	**TOTAL**	**16**	**TOTAL**	**14**

Total for degree = 128 credits. Course offerings may change from year to year. Always check the current course catalog.

*Offered in spring of odd years

**Offered in spring of even years

TO LEARN MORE
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University of Idaho
College of Agricultural and Life Sciences