Biological and Agricultural Engineering

BIOENERGY ENGINEERING OPTION

Design and test new ways to produce and utilize alternative fuels.

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

STUDYING math, biology, chemistry and physics

USING CREATIVITY, scientific knowledge, and engineering know-how to build new devices and processes

USING STRONG COMMUNICATION SKILLS to work in teams that may include farmers, scientists, business people, and policy makers.

This major gives you the skills to design and test new ways to produce fuels and energy from renewable biological sources AND contribute to a sustainable environment. You will learn how energy can be produced from waste materials and agricultural byproducts and understand the science behind the processing of municipal, industrial, forestry, and agricultural waste. Learn about industrial processes such as sorting, grinding, and controlling large-scale chemical reactions. Help develop more efficient ways to use natural resources and reduce pollution. Our faculty is currently researching many options in bioenergy engineering, including the production of biofuels and their use in engines.

INSIDE THE CLASSROOM
Courses in math, chemistry, physics, and biology prepare you to study advanced engineering topics. Much of your education takes place in labs. Make discoveries about renewable energy in the biodiesel and biofuels lab. Learn how electricity flows in the power lab. Use state-of-the-art design software in the computing lab. Experiment with cold flow issues, storage stability, and nitrogen oxide emissions; evaluate engine warranty information. Senior year, you'll draw on everything you have learned to solve a problem for an industry sponsor. Working as a team, you might transform used French fry cooking oil into biodiesel for the J. R. Simplot Company or design a sensor to measure the quality of a biofuel. Present your findings at the University of Idaho Engineering Expo.

OUTSIDE THE CLASSROOM

INTERN. Get practical experiences like these: GORGE ANALYTICAL Work in the quality control lab of a fuel testing laboratory . . . CATERPILLAR Develop fuel systems for engines to operate on alternative fuel . . . TECHNOCHEM Build on-farm and industrial biodiesel plants.

STUDY ABROAD. Deepen your understanding of your major—and the world—in countries like these: MEXICO Tour chicken farms and a tequila manufacturing plant . . . INDIA Learn about 1,000 year-old farming practices on terraced hillsides . . . GERMANY Explore plants that convert canola into diesel fuel.

DO RESEARCH. Earn money working with your professors on grant-funded research projects . . . RENEWABLE DIESEL PRODUCTION GRANT Analyze how to make pure hydrocarbon fuels from vegetable oils and animal fats . . . USDA RESEARCH GRANT Design a probe that uses UV light to detect the amount of biodiesel in a blend of biodiesel and diesel fuel . . . DEPARTMENT OF ENERGY Discover why biodiesel causes less engine wear than regular diesel.

GET INVOLVED. Network and have fun. AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS Join the student branch, plan parties or the homecoming float, meet business leaders and potential employers, and work with a team to build a ¼-scale tractor for the International Student Design Competition . . . TAU BETA PI Receive career assistance and leadership opportunities through this national honor society of engineers . . . SOCIETY OF WOMEN ENGINEERS Network and develop professionally.

FASTFACT

Our seniors created French Fry Fuel—biodiesel made from cooking oil waste.

CAREER OPPORTUNITIES
Our graduates are highly sought by manufacturers, agribusiness firms, government agencies, and nonprofit organizations with starting salaries of up to $55,000.

Here are a few possibilities:

DESIGN ENGINEER. Develop new equipment and systems for biofuels production, fuel quality testing, or equipment manufacturing.

PROCESS ENGINEER. Manage an operation producing alternative fuel from algae.

QUALITY CONTROL ENGINEER. Supervise production in factories, determine the causes of component failure, and test manufactured products to maintain their quality.

PROJECT ENGINEER. Estimate the time and cost to complete projects that improve operations and systems in fuel- or energy-production facilities.

COMBINE YOUR EDUCATION. A second language can open doors to international careers. Depending on your career goals, take courses in chemistry, business, and other types of engineering.

CONTINUE YOUR EDUCATION. Earn an advanced degree in biological and agricultural engineering.

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

WWW.UIDAHO.EDU/CALS/BAE

BIOLOGICAL AND AGRICULTURAL ENGINEERING BIOENERGY 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** Thermodynamics & Heat Transfer	3	**BAE 478** Engineering Design I	3
	Chem 111 Principles of Chemistry I	4	**Engr 105** Engineering Graphics	2	**Engr 335** Engineering Fluid Mechanics	3	**BAE 491** Senior Seminar	1
	Engl 102 College Writing & Rhetoric	3	**Math 275** Analytic Geometry & Calculus III	3	**Engr 350** Engineering Mechanics of Materials	3	**BAE 494** Thermochemical Technologies for Biomass Conversion	3
	ISEM 101 Integrated Seminar	3	**MMBB 250/255** General Microbiology/Lab	5	**ISEM 301** Integrated Seminar	3	**Stat 301** Probability & Statistics	3
	Math 170 Analytic Geometry & Calculus I	4	**Phys 212** Engineering Physics II	3	**Math 310** Ordinary Differential Equations	3	**Elective** Elective—Humanities *or* Social Science	3
					MMBB 380 Introductory Biochemistry	4	**Elective** Elective—Engineering/Technical	3
	TOTAL	**16**	**TOTAL**	**15**	**TOTAL**	**19**	**TOTAL**	**16**
SPRING	**Chem 112** Principles of Chemistry II	5	**Biol 115** Cells & the Evolution of Life	4	****BAE 441** Instrumentation & Measurements	3	**BAE 461** Bioprocess Engineering	3
	Math 175 Analytic Geometry & Calculus II	4	**Chem 277/278** Organic Chemistry/Lab	4	**BAE 485** Fundamentals of Bioenergy & Bioproducts	3	***BAE 462** Electric Power & Controls	3
	Phys 211/211L Engineering Physics I/Lab	4	**Engr 210** Engineering Statics	3	**Comm 101** Fundamentals of Public Speaking	2	**BAE 479** Engineering Design II	3
	Elective Elective—Humanities *or* Social Science	3	**Engr 240** Intro. to Electrical Circuits	3	**Engr 360** Engineering Economy	2	**BAE 492** Biofuels	3
			Elective Elective—Science	3	**Elective** Elective—Engineering/Technical	3	**Elective** Elective—Humanities *or* Social Science	3
					Elective Elective—Humanities *or* Social Science	3		
	TOTAL	**16**	**TOTAL**	**17**	**TOTAL**	**16**	**TOTAL**	**15**

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