

# Biological and Agricultural Engineering

## BIOLOGICAL SYSTEMS ENGINEERING OPTION

Design and test equipment and systems that improve the health and function of living things.

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

STUDYING math, biology, and physics

COMMUNICATING AND WORKING in teams that may include engineers, doctors, scientists, and entrepreneurs

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

This major gives you the skills to design, manage, and develop systems and equipment to improve the health and safety of people, animals, and the environment. You will gain a solid understanding of the neurological, muscular, and mechanical functions that occur in the human body. You will learn to assess weaknesses in these functions and to design solutions, for example, a prosthesis for a missing limb or a new way to deliver drugs to cells.

### INSIDE THE CLASSROOM

Courses in math, chemistry, and animal physiology prepare you for more advanced courses in neurobiology, biochemistry, and biomechanics. Much of your education takes place in labs. Design instruments that measure biological functions in the biosensors lab. Examine body movement and function in the human anatomy and biomechanics lab. Understand how electricity flows in the power lab. Use state-of-the-art design software in the computing lab. Senior year you will draw on everything you have learned to solve a real-world problem. You and your teammates might design an artificial leg that lengthens as a child grows or develop an easy-to-use baby monitor to prevent sudden infant death. Present your findings at the UI Engineering Expo.

### OUTSIDE THE CLASSROOM

**INTERN.** Get practical experiences like these: **PHYSICIANS FOR PEACE** Fabricate and fit prostheses for Iraqi citizens and soldiers . . . **CORNELL UNIVERSITY** Use earthworms to detect heavy metals in hazardous waste . . . **BOISE VA MEDICAL CENTER** Perform studies evaluating heart function in elderly patients on cancer treatment.

**STUDY ABROAD.** Deepen your understanding of your major—and the world—in countries like these: **MEXICO** Study incidence of waterborne diseases in children . . . **TAIWAN** Explore ancient remedies sold in a traditional night market . . . **SWEDEN** Learn about cutting-edge medical advances.

**DO RESEARCH.** Earn money working with faculty on grant-funded research. **IDAHO NATIONAL LABORATORY** Examine how human cells react to different types of radioactive material . . . **NATIONAL SCIENCE FOUNDATION** Design and test a sensor that measures blood flow in the human body . . . **CENTERS FOR DISEASE CONTROL AND PREVENTION** Help build a national database on the human health effects of nanoparticles like those used in deodorant and makeup.

**GET INVOLVED.** Network and have fun. **AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS** Join the student branch, plan the homecoming float, meet

### FASTFACT

Some of our graduates choose medical or dental schools.

business leaders and potential employers, serve a local nursing home . . . **TAU BETA PI** Receive career assistance and leadership opportunities through this national honor society of engineers . . . **SOCIETY OF WOMEN ENGINEERS** Network and develop professionally.

### CAREER OPPORTUNITIES

Our graduates are highly sought by medical equipment manufacturers, biotechnology firms, government agencies, and nonprofit organizations, with starting salaries of up to \$55,000.

Here are a few possibilities:

**MEDICAL RESEARCH ENGINEER.** Design and test new products such as sensors to monitor important systems in the human body. Design medical equipment, prostheses, and aids for disabled individuals.

**QUALITY CONTROL ENGINEER.** Test equipment such as insulin pumps and heart monitors to ensure proper functioning.

**INDUSTRIAL DESIGN ENGINEER.** Develop new products and systems for industrial processes. Create safe, ergonomic equipment for industrial workers.

**PROJECT ENGINEER.** Estimate the time and cost to complete projects. Supervise pharmaceutical, medical, equipment, and other operations.

**COMBINE YOUR EDUCATION.** A second language can open doors to international careers. Depending on your goals, take courses in chemistry, microbiology, molecular biology, animal physiology, business, or other types of engineering.

**CONTINUE YOUR EDUCATION.** Earn an advanced degree in biomedical engineering or life sciences. Go to medical or dental schools.

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

[WWW.CALS.UIDAHO.EDU/BAE](http://WWW.CALS.UIDAHO.EDU/BAE)

	FRESHMAN		SOPHOMORE		JUNIOR		SENIOR	
FALL	BAE 142	2	BAE 242	2	Engr 320	3	BAE 355	3
	Engineering for Living Systems		Engineering Analysis & Design		Engineering Thermodynamics & Heat Transfer		Fundamentals of Hydrologic Engineering	
	Chem 111	4	Biol 115	4	Engr 335	3	BAE 441	3
	Principles of Chemistry I		Cells & the Evolution of Life		Engineering Fluid Mechanics		Instrumentation & Measurements	
	CORE 103-149	4	Chem 277/278	4	Engr 350	3	BAE 478	2
	Core Discovery Course		Organic Chemistry/Lab		Engineering Mechanics of Materials		Engineering Design I	
Engr 102	3	Engr 105	2	MMBB 380	4	BAE 491	1	
College Writing & Rhetoric		Engineering Graphics		Introductory Biochemistry		Senior Seminar		
Math 170	4	Math 275	3	Elective	3	Elective	3	
Analytic Geometry & Calculus I		Analytic Geometry & Calculus III		Elective—Humanities or Social Science		Elective—Upper-division Biological Science		
		Phys 212	3					
		Engineering Physics II						
	<b>TOTAL</b>	<b>17</b>	<b>TOTAL</b>	<b>18</b>	<b>TOTAL</b>	<b>16</b>	<b>TOTAL</b>	<b>12</b>
SPRING	BAE 143	2	Engr 210	3	BAE 461	3	BAE 462	3
	Engineering Problem Solving or CS 112	3	Engineering Statics		Bioprocess Engineering		Electric Power & Controls	
	Intro. to Problem Solving & Programming		Engr 240	3	Comm 101	2	BAE 479	2
	Chem 112	5	Intro. to Electrical Circuits		Fundamentals of Public Speaking		Engineering Design II	
	Principles of Chemistry II		Math 310	3	Stat 301	3	Engr 360	2
	CORE 153-199	3	Ordinary Differential Equations		Probability & Statistics		Engineering Economy	
Core Discovery Course		MMBB 250/255	5	Elective	3	Elective	5	
Math 175	4	General Microbiology/Lab		(For example, Math 437 Mathematical Biology)		(For example, PEP 300 Applied Human Anatomy & Biomechanics)		
Analytic Geometry & Calculus II		Soil 205	3	Elective	3	Elective	3	
Engineering Physics I/Lab		Soil Ecosystem		Elective—Humanities or Social Science		Elective—Humanities or Social Science		
Phys 211/211L	4							
Engineering Physics I/Lab								
	<b>TOTAL</b>	<b>18-19</b>	<b>TOTAL</b>	<b>17</b>	<b>TOTAL</b>	<b>14</b>	<b>TOTAL</b>	<b>15</b>

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

TO LEARN MORE  
 toll free 1.888.88.uidaho  
 1.888.884.3246  
[www.uidaho.edu](http://www.uidaho.edu)

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*“The program was perfect for me because I got a great pre-dental education and also a great backup career if I ever decide dentistry isn’t for me.”*

COOPER MITCHELL, *biological and agricultural engineering major*