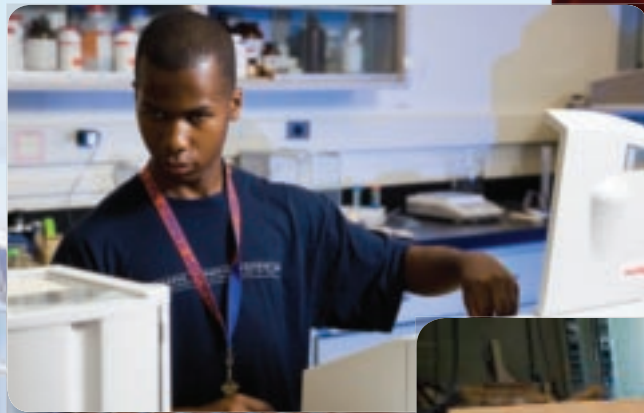




AGRICULTURAL AND BIOLOGICAL ENGINEERING UNDERGRADUATE PROGRAM



Prepare...

yourself for a career in integrating life and engineering for systems in agriculture, food, environment, and energy, and to contribute to the world's largest industry.

The mission of the Department of Agricultural and Biological Engineering is to integrate life and engineering for enhancement of complex living systems involving agriculture, food, environment, and energy.

AGRICULTURAL AND BIOLOGICAL ENGINEERING DOMAINS

- Bio-Based Processing and Production Systems
- Biomass and Renewable Energy
- Precision and Information Agriculture
- Agricultural and Biosystems Management
- Agricultural Safety and Health
- Food Quality and Safety
- Environmental Stewardship
- Land and Water Resources
- Spatially Distributed Systems
- Structure and Facilities for Living Systems
- Indoor Environmental Control
- Bio-sensors, Bio-instrumentation, Bio-informatics, and Bio-nanotechnology
- Intelligent Machinery Systems
- Automation of Biological Systems
- Advanced Life Support Systems



Agricultural and Biological Engineering Core Competencies – The ACESys Model

Automation uses engineering systems to mimic human capabilities, such as perception, reasoning, communicating and planning. An example is the use of a video camera to guide a tractor while working in the field.

Culture is about providing systems that help plants, animals, humans, and microorganisms to be able to live and grow in optimal conditions. An example is the optimization of growing conditions for algae.

Environment addresses issues concerning the surroundings and processes of plants, humans, microorganisms and animals relative to climate, nutrition and structures. An example is the design of a filter for dust removal in animal buildings.

Systems analysis and integration is the intersection of automation, culture and environment. It is a process that starts with the definition of a system and its goals, and leads to a decision regarding the system's feasibility, practicality, productivity and reliability.

The Agricultural and Biological Engineering (ABE) Undergraduate Program at the University of Illinois, Urbana-Champaign is housed within the Department of Agricultural and Biological Engineering. The program has consistently been ranked as one of the top programs in the country according to *US News & World Report* including the #1 ranking in 2006, 2007, and 2008. We are fortunate to be part of two highly respected colleges, the College of Engineering and the College of Agricultural, Consumer, and Environmental Sciences (ACES). While we are part of a large campus, the small size of the Department allows for frequent student-faculty interaction and a truly family-like atmosphere. As students at Illinois, undergraduates also enjoy the benefits of being part of a large university including access to Big Ten athletic events, nearly 1000 student organizations, top notch library facilities, and a variety of cultural events.

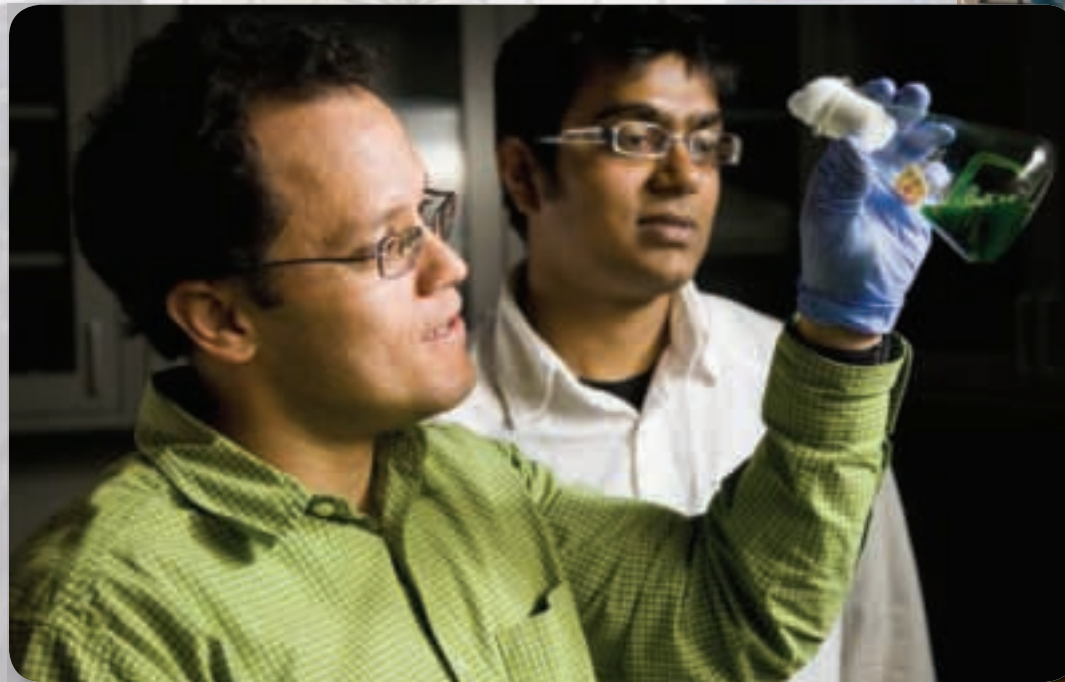


Degree Programs

The Department offers two undergraduate degree paths for engineers. Depending on which degree path students choose, they enter the program through the College of Engineering or the College of Agricultural, Consumer, and Environmental Sciences (ACES). Both curricula offer flexibility so that students can customize their studies to suit their career and research interests. All students participate in an industry-linked design project during their senior year.

	4-year program	5-year program
Degree(s) received	Bachelor of science (BS) in Agricultural and Biological Engineering	Dual BS degrees in Agricultural and Biological Engineering and Agricultural and Biological Engineering Sciences
Degree(s) conferred by	College of Engineering	Colleges of ACES and Engineering
Course work	Basic and advanced engineering principles, agricultural and biological sciences, and other technical subjects.	Same as 4-year program with additional agricultural, physical, and biological sciences course work required.

Both undergraduate degree programs prepare students to become certified as professional engineers should they choose to do so. As such, we are an accredited program through ABET, Inc. the accrediting agency for engineering and technology degree programs.



Bioenvironmental Engineering (BEE)

Students in **Bioenvironmental Engineering** learn to apply engineering principles to biological systems in order to:

- Design systems that provide the desired environmental conditions for animals, human housing, crop storage structures, greenhouses, and other biological systems.
- Develop systems to handle and treat biowaste.
- Design and manufacture animal shelters, greenhouses, farmstead structures, and other buildings.

Curriculum highlights include:

- Building Environmental Control
- Structural Engineering
- Renewable Energy Systems
- Indoor Air Quality Engineering

BEE graduates are prepared for a broad range of career opportunities with equipment manufacturers, including:

- Consulting firms
- Government (Environmental Protection Agency, Office of Air Quality Planning and Standards, Department of Energy Office of Environmental Management)
- Industry (Trane, GSI Grain Systems, Johnson Controls)



Biological Engineering (BE)

Biological Engineering integrates biology and engineering to provide solutions to problems related to living systems - plants, animals, humans and microorganisms. Students in **BE** will:

- Evaluate engineering biological systems at the molecular level - nanometer-scale devices that consist of a few biomolecules inside individual cells.
- Evaluate systems at the other extreme - regionally-scaled complex ecosystems that depend upon multiple species of interacting living organisms.
- Learn why such systems are becoming increasingly important in areas such as bioenergy, bioprocessing, alternative energy and nanotechnology.

Curriculum highlights include:

- Engineering of Living Systems
- Earth Systems Modeling
- Biosensors
- Biological Nanoengineering

BE graduates will be prepared for challenging careers including:

- Consulting firms (Waterborne Environmental, Inc.)
- Government (National Aeronautics and Space Administration, Natural Resources Conservation Service)
- Industry (Dow Agrosciences)
- Research (Danforth Plant Center)



Food and Bioprocess Engineering (FBE)

Food and Bioprocess Engineering is the application of engineering principles to biological materials to make useful food, feed, and energy products. In the **FBE** division, students:

- Develop and test new human and animal food and food ingredients from agricultural products.
- Design, develop, and evaluate new processes and machines for fractionating raw agricultural products into energy, animal feed, and human food ingredients.
- Evaluate environmental factors and energy efficiencies associated with food and energy processing.

Curriculum highlights include:

- Renewable Energy Systems
- Grain Bioprocessing Coproducts
- Engineering Properties of Food Materials
- Bioprocessing Grains for Fuels

FBE graduates are trained to bring hands-on experience to the many exciting positions available within:

- Consulting firms
- Government (Food and Drug Administration, Department of Energy)
- Industry (Archer Daniels Midland, Cargill, Kraft)
- Research (Battelle Memorial Institute)



Off-Road Equipment Engineering (OREE)

Off-Road Equipment Engineering provides students with knowledge and skills in the design, manufacturing, testing and operation of agricultural and construction equipment. In the **OREE** division, students:

- Design specific machine components (such as engines and drive trains) and complete machinery (tractors, backhoes, and combines).
- Create equipment control systems for the agricultural and construction industries.
- Design products for the fluid/hydraulics industry.

Curriculum highlights include:

- Off-Road Machine Design
- Engineering Off-Road Vehicles
- Electrohydraulic Systems
- Engineering Measurement Systems

OREE graduates are equipped to provide leadership and inspire innovation in a variety of positions, including:

- Consulting firms
- Government (Agricultural Research Service)
- Industry (Caterpillar, Deere, Walterscheid, Case IH, New Holland)

Soil and Water Resources Engineering (SWRE)

Students in **Soil and Water Resources Engineering** learn principles and practices related to development, conservation, and sustainable use of natural ecosystems, including land and water resources. Students in **SWRE** division will:

- Develop practices to control non-point source pollution, erosion and sediment.
- Design systems for sustaining and improving water quality; ecosystems; storm water management and flood control.
- Develop irrigation, water management, and drainage systems for sustainability.

Curriculum highlights include:

- Non Point Pollution Processes, Control, and Modeling
- Drainage and Water Management
- Ecological Quality Engineering
- Urban Hydrology and Hydraulics

SWRE graduates are prepared for exciting positions available in public and private organizations, including:

- Consulting firms
- Government (Environmental Protection Agency, Foreign Agricultural Service)
- Industry (DuPont, Monsanto)
- Research (WorldBank)



Internships and Placement

Students have access to career counseling and services from several places on campus including within the Department. They can make use of these services to obtain a summer or even semester-long internship within government or industry. These internships often lead to full time employment upon graduation. Each year, we see virtually 100% placement within six months of graduation. Students graduate with the ability to help solve some of the world's most pressing problems in the agriculture, food, environment, and energy sectors.

Study Abroad

The colleges and university help students prepare to enter an increasingly global marketplace. Students interested in studying abroad can take advantage of many overseas programs. Through the Department, students have the opportunity to participate in programs in South Africa and India.

Leadership

Students have the chance to develop their leadership skills in the classroom working on team design projects, in the lab or field doing cutting-edge research, on the job taking initiative during an internship, and in student organizations preparing for national competitions.

Research

Students can perform research with faculty in the Department for independent study credit or as part-time employment. Some students choose to work full-time over the summer assisting faculty with their research.

Clubs

The Illinois campus is home to almost 1000 registered student organizations all of which are open to our students. The clubs most closely associated with the Department are the American Society of Agricultural and Biological Engineers (ASABE) student branch, the Illini Pullers quarter scale tractor design team, the International Genetically Engineered Machine (iGEM) team, the Agricultural Mechanization Club, and Alpha Epsilon, the agricultural and biological engineering honor society.



Advising

The Department's low faculty-to-student ratio assures that students receive personalized attention throughout their college careers. When students enter the program, they are assigned to a faculty advisor who will help with course selection, graduation requirements, and career planning.

Admissions

Admissions requirements for entering freshmen are based on high school courses, end-of-year junior class rank, and ACT or SAT results. A statement of your personal and academic interests and intellectual or professional goals will be required. Transfer students are evaluated on their grade point average earned in one or two years of transferable course work at another institution.

The Priority Filing Period is September 1 through November 1 for freshmen, although later applications are accepted through January 2. Transfer students may apply September 1 through November 1 for spring admission, and January 15 through March 1 for fall admission.

Financial Aid

Loans, scholarships, and grants are available from state, university, college and private sources.

- The College of Agricultural, Consumer and Environmental Sciences oversees the Jonathan Baldwin Turner merit-based scholarship program which awards about sixty \$4000 scholarship packages. Special application is required, and interviews are held for qualifying applicants in the summer between their high school junior and senior years. (<http://students.aces.uiuc.edu/scholarships>)
- The Department of Agricultural and Biological Engineering offers scholarships up to \$2,500 for incoming freshmen and advanced students. (http://abe.illinois.edu/students/age_scholarships)
- Selected undergraduate scholarships are available from the College of Engineering for Agricultural and Biological Engineering Students. (<http://engineering.illinois.edu/students/scholarships/index.php>)



Need more information?

For more information regarding programs of study within the Department of Agricultural and Biological Engineering or to arrange for a visit and tour of the Department:

Department of Agricultural and Biological Engineering
University of Illinois at Urbana-Champaign
338 Agricultural Engineering Sciences Building
1304 W. Pennsylvania Avenue
Urbana, Illinois 61801
(217) 333-3570
Fax: (217) 244-0323
e-mail: abe@illinois.edu
abe.illinois.edu

For more information regarding applying and admissions:

Office of Undergraduate Admissions
University of Illinois at Urbana-Champaign
901 W. Illinois St.
Urbana, Illinois 61801
(217) 333-0302
www.admissions.illinois.edu

For more information regarding financial aid available:

Office of Student Financial Aid
University of Illinois at Urbana-Champaign
Turner Student Services Building
610 E. John St.
Champaign, Illinois 61820
(217) 333-0100
www.ofsa.illinois.edu

For more information regarding campus tours:

Campus Visitors Center
University of Illinois at Urbana-Champaign
Levis Faculty Center
919 W. Illinois St.
Urbana, Illinois 61801
(217) 333-0824
www.admissions.illinois.edu/visit/index.html



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