BIOLOGICAL SYSTEMS ENGINEERING, B.S.

Biological systems engineering (BSE) is the application of engineering principles to biological and agricultural systems which greatly impact our food, fiber, and renewable energy resources. Since biological systems engineering programs focus heavily on the protection and conservation of natural resources, it is not uncommon for them to be described as sustainable engineering programs.

Within the BSE program a student must enroll in either the *General Program* area or in one of the following three specialization areas: *Machinery Systems Engineering, Natural Resources and Environmental Engineering,* or *Food and Bioprocess Engineering*. The specialization in Food and Bioprocess Engineering is split into a Food Engineering track and a Bioprocess Engineering track.

Students who complete all degree requirements are awarded a *Bachelor of Science–Biological Systems Engineering* degree. A student who completes one of the three program specializations will have the area of specialization identified on the official transcript. The BSE program, like all undergraduate engineering programs on the UW–Madison campus, is accredited by ABET (http://www.abet.org). Accreditation by ABET is an indication of program quality and has major benefits for individuals seeking registration as a licensed professional engineer. A UW–Madison BSE graduate may apply for licensure as a registered professional engineer once they have passed the Fundamentals of Engineering (FE) exam, obtained four years of qualifying engineering work experience, and have passed the Professional Engineering (PE) exam. To obtain a BSE degree from UW–Madison, a student must have taken (but is not required to have passed) the FE exam as part of their Senior Design sequence. Information about the FE exam can be found at Fundamentals of Engineering Exam (http://ncees.org/exams/fe-exam/).

Graduates work in career fields associated with the growth, harvest, transportation, processing and storage of food, feedstuffs, biomass for energy production and forestry products. This includes, but is not limited to, jobs involving the design, construction and management of: bio-energy production facilities, greenhouses, food processing plants, soil management systems and erosion control structures, irrigation and drainage systems, wastewater and solid waste treatment/recycling operations, animal housing facilities, aquaculture enterprises, systems for improved air quality, and equipment for agricultural production, material handling, processing, and packaging. Job opportunities for BSE graduates remain plentiful and show no signs of decreasing given (1) the increase in world population and corresponding increasing need for food, fiber and renewable energy, (2) the measurable shortage of highly trained technical personnel in the United States, and (3) the constantly expanding emphasis on protection and conservation of natural resources.

The UW–Madison BSE program is traditionally known for its emphasis on undergraduate education which is reflected in outstanding one-on-one advising and smaller class sizes.

The BSE program requires completion of a minimum of 125 credits to be eligible for graduation. Note that this is higher than the minimum for other CALS programs.

HOW TO GET IN

Entry to this professional program requires students to meet the five admission requirements detailed below. Students are admitted to the department as pre-Biological Systems Engineering until they meet the admission criteria. **Admission eligibility must be confirmed by the department.**

1. Must complete a minimum of 24 degree credits.
2. Must have completed a minimum of 17 graded credits of calculus, statistics, chemistry, computer science, statics, biology, and physics courses required for a BSE degree.
3. Must have a math and science grade point average (M&SGPA) of at least 2.65 with a minimum grade of C in every course used to calculate the M&SGPA. The M&SGPA is based on: math courses numbered 217 and above (MATH 228 is excluded); statistics courses numbered 224 and above; all chemistry courses; all biology courses (courses with biological science breadth; maximum three courses, any required course must be included if taken); computer sciences courses numbered 302 and above (COMP SCI 402 is excluded); E M A 201 Statics; and physics courses numbered 201 and above. For any course that a student repeats, only the most recent grade will be used in the calculation. Any transfer course from another university that is included in the previous list must be included in the GPA calculation.
4. Must be in good academic standing—i.e., not on academic probation or dropped status.
5. Must successfully complete introductory chemistry (CHEM 103 General Chemistry I & CHEM 104 General Chemistry II, or CHEM 109 Advanced General Chemistry, or equivalent) and math through MATH 222 Calculus and Analytic Geometry 2.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext) section of the *Guide*.

General Education	• Breadth—Humanities/Literature/Arts: 6 credits • Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits • Breadth—Social Studies: 3 credits • Communication Part A & Part B * • Ethnic Studies * • Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

In addition to the University General Education Requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies, Science, and Capstone), but courses counted toward university requirements may also be used to satisfy a college and/or a major requirement; similarly, courses counted toward college requirements may also be used to satisfy a university and/or a major requirement.

COLLEGE REQUIREMENTS FOR ALL CALS B.S. DEGREE PROGRAMS

Code	Title	Credits
Quality of Work: Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation.		
Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree.		
First Year Seminar (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext)		1
International Studies (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext)		3
Physical Science Fundamentals		4-5
CHEM 103	General Chemistry I	
or CHEM 108	Chemistry in Our World	
or CHEM 109	Advanced General Chemistry	
Biological Science		5
Additional Science (Biological, Physical, or Natural)		3
Science Breadth (Biological, Physical, Natural, or Social)		3
CALS Capstone Learning Experience: included in the requirements for each CALS major (see "Major Requirements") (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext)		

NAMED OPTIONS WITHIN THE MAJOR

Students may complete the Biological Systems Engineering General Program or select a Named Option. The course requirements on this page represent the general program. Students are encouraged to consider one of the Named Options (Food and Bioprocess Engineering; Machinery Systems Engineering; or Natural Resources and Environmental Engineering). Links to learn more about these options, including the course requirements, are included below.

View as listView as grid

- BIOLOGICAL SYSTEMS ENGINEERING: FOOD AND BIOPROCESS ENGINEERING (HTTP://GUIDE.WISC.EDU/UNDERGRADUATE/AGRICULTURAL-LIFE-SCIENCES/BIOLOGICAL-SYSTEMS-ENGINEERING/BIOLOGICAL-SYSTEMS-ENGINEERING-BS/BIOLOGICAL-SYSTEMS-ENGINEERING-FOOD-BIOPROCESS-ENGINEERING-BS/)
- BIOLOGICAL SYSTEMS ENGINEERING: MACHINERY SYSTEMS ENGINEERING (HTTP://GUIDE.WISC.EDU/UNDERGRADUATE/AGRICULTURAL-LIFE-SCIENCES/BIOLOGICAL-SYSTEMS-ENGINEERING/BIOLOGICAL-SYSTEMS-ENGINEERING-BS/BIOLOGICAL-SYSTEMS-ENGINEERING-MACHINERY-SYSTEMS-ENGINEERING-BS/)
- BIOLOGICAL SYSTEMS ENGINEERING: NATURAL RESOURCES AND ENVIRONMENTAL ENGINEERING (HTTP://GUIDE.WISC.EDU/UNDERGRADUATE/AGRICULTURAL-LIFE-SCIENCES/BIOLOGICAL-SYSTEMS-ENGINEERING/BIOLOGICAL-SYSTEMS-ENGINEERING-BS/BIOLOGICAL-SYSTEMS-ENGINEERING-NATURAL-RESOURCES-ENVIRONMENTAL-ENGINEERING-BS/)

MAJOR REQUIREMENTS

Code	Title	Credits
Major Requirements		
Common Requirements		53
General Program Classes and Technical Electives		43
Capstone		5
Total Credits		**101**

COMMON REQUIREMENTS

Code	Title	Credits
The Biological Systems Engineering program requires completion of a minimum of 125 credits to be eligible for graduation. Note that this is higher than the minimum for other CALS programs.		
Mathematics and Statistics		
MATH 221	Calculus and Analytic Geometry 1	5
MATH 222	Calculus and Analytic Geometry 2	4
MATH 234	Calculus--Functions of Several Variables	4
MATH 319	Techniques in Ordinary Differential Equations	3
or MATH 320	Linear Algebra and Differential Equations	
STAT 324	Introductory Applied Statistics for Engineers	3

Chemistry		
Select one of the following:		5-9
CHEM 109	Advanced General Chemistry (Recommended)	
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II [1]	
Biology		
BSE 349	Quantitative Techniques for Biological Systems	3
One additional Biological Science breadth Course; the following courses are preferred choices: [2]		2-5
BIOLOGY/ BOTANY/ ZOOLOGY 151	Introductory Biology	
ZOOLOGY 153	Introductory Biology	
BIOLOGY/BOTANY 130	General Botany	
BIOLOGY/ ZOOLOGY 101	Animal Biology	
MICROBIO 101	General Microbiology [3]	
MICROBIO 303	Biology of Microorganisms [3]	
Physics		
E M A 201	Statics [4]	3
PHYSICS 202	General Physics	5
Foundation		
BSE 270	Introduction to Computer Aided Design	3
BSE 380	Introductory Data Science for the Agricultural and Life Sciences (preferred)	3
or COMP SCI 310	Problem Solving Using Computers	
BSE 310	Project Economics & Decision Analysis (preferred)	3
or I SY E 313	Engineering Economic Analysis	
Core		
BSE 249	Engineering Principles for Biological Systems [5]	3
or CBE 250	Process Synthesis	
BSE 365	Measurements and Instrumentation for Biological Systems	3
BSE 308	Career Management for Engineers	1
Total Credits		**53-60**

1. Taking the combination of CHEM 103 and CHEM 104 instead of CHEM 109 may increase the total minimum number of credits required to complete the program.
2. Any biological science course of 2 or more credits is accepted. Additional courses taken may be counted as Technical Electives.
3. MICROBIO 101 or MICROBIO 303 required for Food & Bioprocess Engineering specialization.
4. E M A 201 Statics is an acceptable prerequisite for PHYSICS 202 General Physics.
5. Students selecting the Food & Bioprocess Engineering option who plan to enroll in CBE 310 Chemical Process Thermodynamics and CBE 320 Introductory Transport Phenomena must take CBE 250 here as a prerequisite. Students selecting the Food & Bioprocess Engineering option who plan to enroll in M E 361 Thermodynamics and M E 363 Fluid Dynamics are recommended to take BSE 249 here.

GENERAL PROGRAM REQUIREMENTS

Code	Title	Credits
M E 361	Thermodynamics [1]	3
or CBE 310	Chemical Process Thermodynamics	
Select one of the following: [1]		3-4
M E 363	Fluid Dynamics	
CIV ENGR 310	Fluid Mechanics	
CBE 320	Introductory Transport Phenomena	
BSE 464	Heat and Mass Transfer in Biological Systems	3
E M A 303	Mechanics of Materials	3
or M E 306	Mechanics of Materials	
Select a minimum of three of the following:		6-9
BSE 201	Land Surveying Fundamentals	
BSE/ ENVIR ST 367	Renewable Energy Systems	
BSE/CIV ENGR/ SOIL SCI 372	On-Site Waste Water Treatment and Dispersal	
BSE/FOOD SCI/ M E 441	Rheology of Foods and Biomaterials	
BSE 460	Biorefining: Energy and Products from Renewable Resources	
BSE 461	Food and Bioprocessing Operations	
BSE 472	Sediment and Bio-Nutrient Engineering and Management	
BSE 473	Water Management Systems	
BSE/M E 475	Engineering Principles of Agricultural Machinery	
BSE/M E 476	Engineering Principles of Off-Road Vehicles	
BSE 571	Small Watershed Engineering	
BSE/ FOOD SCI 642	Food and Pharmaceutical Separations	
Select a minimum of 9 credits of 300 level or above non-BSE engineering courses		9
Total Credits		**27-31**

1. Take BSE 249 and M E 361 and M E 363, or take CBE 250 and CBE 310 and CBE 320.

TECHNICAL ELECTIVES

Select courses from one or more of the following four technical elective categories to bring the total number of credits in the General Program Area or in the selected specialization area to 43. See the BSE Undergraduate Student Handbook for a list of recommended technical electives for various areas of specialization.

A. INTRODUCTION TO ENGINEERING COURSES (FRESHMEN ONLY)

Code	Title	Credits
INTEREGR 170	Design Practicum	3
BSE 170	Product Design Practicum	2

B. INDEPENDENT STUDY/INSTRUCTION COURSES

CALS or CoE courses with a 001, 299, 399, or 699 course number. No more than 3 credits of coursework in this category can be used to meet technical elective requirements.

C. UPPER-LEVEL COURSES

Part 1. Upper-Level Engineering Courses

This includes BSE courses not taken to meet other curricular requirements. This does not include independent study/instruction courses.

Code	Title	Credits
Any Engineering course numbered 300 or above		
E M A 202	Dynamics	3
or M E 240	Dynamics	

Part 2. Upper-Level Science Courses

This includes BSE courses not taken to meet other curricular requirements. This does not include independent study/instruction courses.

Code	Title	Credits
Advanced biological, natural, and physical science courses (i.e., courses with a B, N, or P designation)		
CHEM 341	Elementary Organic Chemistry	3
CHEM 342	Elementary Organic Chemistry Laboratory	1
CHEM 343	Introductory Organic Chemistry	3
CHEM 344	Introductory Organic Chemistry Laboratory	2
CHEM 345	Intermediate Organic Chemistry	3
CHEM/M S & E 421	Polymeric Materials	3
AGRONOMY/ATM OCN/SOIL SCI 532	Environmental Biophysics	3

D. LOWER-LEVEL SCIENCE AND ENGINEERING COURSES, BREADTH COURSES

Elementary and intermediate biological, natural and physical science courses except elementary and intermediate math courses; College of Engineering courses with a 100 or 200 level designation; College of Agricultural and Life Sciences courses, Institute of Environmental Studies courses, and/or School of Business courses. Independent study/instruction courses cannot be counted in this category. No more than 12 credits of coursework in this category can be used to meet technical elective requirements.

CAPSTONE

Code	Title	Credits
BSE 508	Biological Systems Engineering Design Practicum I	2
BSE 509	Biological Systems Engineering Design Practicum II [1]	3
Fundamentals of Engineering Exam [1]		

[1] Grades for BSE 509 will not be posted until proof of examination is presented.

UNIVERSITY DEGREE REQUIREMENTS

Total Degree	To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.
Residency	Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. “In residence” credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.
Quality of Work	Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

LEARNING OUTCOMES

1. The ability to analyze systems, components and processes. This includes: the ability to apply knowledge of mathematics, science, and engineering fundamentals; the ability to use the techniques and tools of modern engineering practice; the ability to identify, formulate, and solve engineering problems.
2. The ability to create a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
3. The ability to formulate and conduct basic investigations such as laboratory experiments, prototype tests, field trials, computer simulations and market analyses.
4. The ability to identify important resources, and to retrieve, interpret, analyze and critique information for use in solving engineering problems and conducting basic investigations.
5. The ability to communicate effectively. This includes: the ability to effectively orally communicate; the ability to write in a clear, concise, grammatically correct and organized manner; the ability to document work activities and properly archive information; the ability to develop appropriate illustrations including hand sketches, computer generated drawings/graphs and pictures.
6. An understanding of professional and ethical responsibility.
7. The ability to function on multidisciplinary teams.
8. The broad education necessary to understand and assess the impact of engineering solutions in a global, economic, environmental, and societal context.

9. Recognition of the need, and the ability to engage in lifelong learning.
10. Knowledge of contemporary issues.

FOUR-YEAR PLAN

FOUR-YEAR PLAN

SAMPLE BIOLOGICAL SYSTEMS ENGINEERING FOUR-YEAR PLAN—GENERAL PROGRAM

Freshman

Fall	Credits	Spring	Credits
MATH 221	5	MATH 222	4
Biological Science Course	3	BSE 310	3
CHEM 109[1]	5	BSE 380	3
General Education Course	3	BSE 170 or INTEREGR 170	2-3
		LSC 100 (or other Comm A)	3
	16		**15-16**

Total Credits 31-32

Sophomore

Fall	Credits	Spring	Credits
E M A 201	3	BSE 349	3
MATH 234	4	MATH 320	3
BSE 249	3	M E 306	3
BSE 270	3	PHYSICS 202	5
General Education Course	3	BSE 308	1
	16		**15**

Total Credits 31

Junior

Fall	Credits	Spring	Credits
M E 361	3	INTEREGR 397 (or other COMM B)	3
BSE Course	3	M E 363	3
STAT 324	3	BSE 508	2
300 level or higher non-BSE engineering course	3	BSE Course	3
Technical Elective Course	3	General Education Course	6
General Education Course	3	BSE 365	3
	18		**20**

Total Credits 38

Senior

Fall	Credits	Spring	Credits
BSE 509	3	BSE 464	3
BSE Course	3	General Education Course	3
Technical Electives	4	300 level or higher non-BSE engineering course	3
General Education Course	3	Free Elective Course	3
300 level or higher non-BSE engineering course	3	Technical Electives	4
	16		**16**

Total Credits 32

[1] If CHEM 103 & CHEM 104 are taken in place of CHEM 109, it is suggested to take CHEM 103 in the fall semester and CHEM 104 in the spring semester of year 1, and move BSE 310 to the fall semester of year 2.
- Need 125 credits to complete degree.

ADVISING AND CAREERS

ADVISING

All students are assigned an advisor when they join the department. Freshmen and other pre-biological systems engineering students work with a professional staff advisor. Once full admission requirements are met, students transition to a faculty advisor in their specialization area. All students are encouraged to outline a degree plan soon after declaring the major. Curriculum checklists for each track have been developed to assist students in this process. Many BSE courses are offered only once each year, which must be considered as part of the planning process. Student plans may vary based on previous coursework, plans for study abroad or certificate interest, co-op semesters, and individual interests. Prospective students should contact the department at bse@wisc.edu or 608-262-3310 for more information.

CAREERS

Solve. Create. Invent. Sustain.

Biological Systems engineers combine their knowledge of life sciences, agriculture, and technology, with engineering problem-solving skills to address many of the most pressing problems facing the world today: providing safe and nutritious food, generating renewable energy, and preserving the natural environment.

If you like hands-on problem solving, you should consider Biological Systems Engineering (BSE) as your major.

Graduates can expect to find biological and agricultural engineering careers in a wide range of agencies and industries solving problems in many different areas. Graduates work in career fields associated with the growth, harvest, transportation, processing and storage of food, feedstuffs, biomass for energy production and forestry products. This includes, but is not limited to, jobs:

- designing and managing bio-energy systems, greenhouses, and food processing plants
- designing animal housing and environmental control systems
- developing irrigation and drainage systems
- protecting soils, and air and water quality
- designing and running wastewater treatment and waste management operations
- designing off-road equipment for agricultural production and material handling.

Job opportunities for BSE graduates remain plentiful and show no signs of decreasing given (1) the increase in world population and corresponding increasing need for food, fiber and renewable energy, (2) the measurable shortage of highly trained technical personnel in the United States, and (3) the constantly expanding emphasis on protection and conservation of natural resources.

PEOPLE

PROFESSORS

Robert Anex, Christopher Choi, Sundaram Gunasekaran, Awad Hanna, Krishnapuram Karthikeyan, Xuejun Pan, Douglas Reinemann, Troy Runge (chair), John Shutske, Kevin Shinners, Anita Thompson

ASSOCIATE PROFESSORS

Rebecca Larson, Paul Stoy

ASSISTANT PROFESSORS

Matt Digman, Brian Luck, Zhou Zhang

STAFF

Department Administrator: Susan Reinen
Student Services: Betsy Wood

WISCONSIN EXPERIENCE

Through our curriculum, BSE students have opportunities for many high-impact learning experiences including hands-on lab courses, involvement in student organizations, and BSE's capstone design classes. Introductory engineering courses and career management courses are built into the curriculum to make sure you have a community to succeed both at UW–Madison and after you graduate.

Beyond traditional classes, our students work or perform independent study with professors not only in BSE but throughout the campus. Many campus labs and shops need students who know how to design and build systems, skills at which you will excel through your experiences in BSE. Outside the university, BSE students can take advantage of internships and co-ops, but are also in high demand for programs such as Peace Corps and Engineers without Borders. BSE has an active student organization ASABE (http://asabe.bse.wisc.edu/), where students network with professionals and provide service projects to the community.

As a BSE student, you will be proud that you are contributing to the social and economic well-being of Wisconsin and beyond by designing solutions to feed and fuel the world in a sustainable manner. Many of our students go on to work in the following areas:

- Machinery systems that support the agricultural production sector including precision agriculture, cultural and processing technology, and logistics for crop and animal production with a focus on dairy facilities and milking technology.
- Natural resource systems that support both agricultural producers and environmental agencies in the areas of air and water quality, and waste mitigation and utilization.
- Food production systems that support the food industry striving for improvements in food processing, safety, and security.
- Bioprocessing systems that support bioenergy and bioproducts industries including biomass production and logistics systems, biomass conversion technologies, and forest products.

Or, you may take the skills you learn through your experiences at BSE and apply them to a brand new challenge. We are excited to see what you will do.

RESOURCES AND SCHOLARSHIPS

SCHOLARSHIPS

All BSE students are encouraged to apply annually for department and CALS scholarships through the Wisconsin Scholarship Hub (WiSH). Each year the BSE department selects more than two dozen outstanding students to receive financial support through scholarships.

THE BSE SHOP

The Biological Systems Engineering Shop is dedicated to providing BSE students a hands-on experience with machining equipment found throughout the production sector of industry. The shop, located at 540 Elm Drive, is open to all BSE students who have completed the *shop safety form* (renewed annually) and have read and understood the *Shop Rules and Regulations*. In addition, a yearly refresher is required which consists of watching the shop safety presentation and completing a short, yearly safety quiz. Whether you have never worked in a shop before, or already feel at home working with this type of machinery, we welcome you to the BSE Shop and want to make you feel comfortable in this learning environment.

BSE students are welcome to learn various machining and metal fabrication techniques as well as woodworking skills. These skills are aimed at improving students' understanding of the design, fabrication, and assembly processes through one-on-one training and hands-on operation of the machines—before they enter the workforce. To operate any of the shop machines, students must first be authorized by completing the online *Canvas course* and provide a one-on-one, hands-on operation with the shop supervisor to demonstrate understanding of the machine's controls and capabilities. To maintain a safe work environment, the shop is under 24-hour video surveillance. For additional details, please see Shop Info for Students (https://bse.wisc.edu/bse-shop-home/shop-info-for-students/).

CAE COMPUTER LAB

A dedicated student computer lab in room 217 of the Agricultural Engineering Building offers 10 computer workstations and space for group work. These machines have the same software packages as those found in Computer Aided Engineering labs on the Engineering campus. A CAE printer is also provided.

THE B1 LOUNGE

In the basement of the Agricultural Engineering Building is a large room with multiple tables and chairs that can be used for group study or individual work. Department-wide social events are also held here. A microwave oven and vending machines are available for student use.

ACCREDITATION

Accreditation.

Accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org (http://www.abet.org/).

Note: Undergraduate Program Educational Objectives and Student Outcomes are made publicly available at the Departmental website. (In this Guide, the program's Student Outcomes are designated by our campus as "Learning Outcomes.")