

Graduate Studies



Advancing Engineering Knowledge in Biological, Agricultural and Food Systems

Biological Systems Engineering
University of Wisconsin
460 Henry Mall
Madison, WI 53706

Phone: (608) 262-3310

Fax: (608) 262-1228

Website: <http://www.bse.wisc.edu>

ADMISSION REQUIREMENTS

Admission to the graduate programs normally requires a bachelors degree in engineering with a minimum grade-point average of 3.0 on the last 60 hours of work toward the bachelors degree. Students holding bachelors degrees from other programs may be admitted to the graduate program, but will complete certain courses in the basic sciences and engineering without graduate credit. All applicants must submit an application, transcripts, a statement of purpose and three letters of reference. Each applicant's credentials are evaluated by the Graduate Instruction and Research Committee of the department. Special attention is given to undergraduate achievement, previous graduate work, apparent research ability and compatibility of student objectives with the research objectives of the department.

Graduate Record Examination scores are encouraged but not required except for students who wish to compete for fellowship or scholarship awards. Every applicant whose native language is not English must provide scores from the Test of English as a Foreign Language (TOEFL), OR the Michigan English Language Assessment Battery (MELAB). An admitted applicant whose TOEFL score is below 580 or MELAB below 89 will be required to take the English as a Second Language Assessment Test (ESLAT) upon arrival, and register for any recommended English as a Second Language (ESL) course(s).

FINANCIAL ASSISTANCE

Graduate research assistantships are often available for both Masters and Doctoral students working on specific research projects. These assistantships waive out-of-state tuition and resident tuition; however, segregated fees apply to all students holding assistantships. The request for assistantship should be included with the application. Research support is normally limited to three semesters and two summers for students in the MS program and to six semesters and four summers for students in the PhD program.

FACULTY AND AREA OF INTEREST

Bonnhoff, David R.; Assoc Prof; Ph.D.
Structural Design and Analysis

Bubenzner, Gary D.; Prof; Ph.D.
Erosion and Small Watershed Hydrology

Converse, James C.; Prof; Ph.D.
Domestic and Animal Waste Systems, Energy

Gunasekaran, Sundaram; Prof; Ph.D.
Food Engineering

Hanna, Awad S.; Assoc Prof; Ph.D.
Construction Engineering and Management

Hartel, Richard W.; Prof; Ph.D.
Food Engineering

Holmes, Brian J.; Prof; Ph.D.
Farmstead Engineering, Energy

Kammel, David W.; Prof; Ph.D.
Building Systems and Materials

Koegel, Richard G.; Prof; Ph.D.
Crop Processing Systems, Design and Development

Kung, Sam; Prof, Ph.D.
Soil Physics

Muck, Richard E.; Prof, Ph.D.
Modeling Forage Preservation

O'Leary, Philip R.; Prof; Ph.D.
Environmental Quality

Peterson, James O.; Prof; Ph.D.
Water Quality

Purschwitz, Mark A.; Assoc Prof; Ph.D.
Agricultural Safety and Health

Reinemann, Douglas J.; Assoc Prof; Ph.D.
Machine Milking, Farm Energy Management

Rowell, Roger M.; Prof, Ph.D.
Biomaterials Research

Schuler, Ronald T.; Prof, Ph.D.
Power and Machinery, Conservation Tillage

Shinners, Kevin J.; Prof, Ph.D.
Crop Harvesting, Site Specific Farming

Straub, Richard J.; Prof & Chair; Ph.D.
Power and Machinery, Bio-processing

Walsh, Patrick W.; Prof; Ph.D.
Liability, Recycling, CNRED Program Leader

DEGREE PROGRAMS

The Department offers graduate programs leading to the Master of Science (MS) and the Doctor of Philosophy (PhD) degrees.

Master of Science (MS) : Two options are available for completing the Master of Science degree. The thesis option stresses the scientific aspects of engineering and allows students to develop research skills. Eighteen course credits and six thesis credits are required to complete this option. A thesis is required which demonstrates proficiency in research. The non-thesis option emphasizes continued development of the technical skills required of modern engineers. A minimum of 30 credits beyond the Bachelor of Science degree are required. At least 24 of these credits must be course credits. The remaining six credits are devoted to independent study.

Doctor of Philosophy (PhD) : Students in the Doctor of Philosophy degree program are concerned with advancement of knowledge through “cutting-edge research” and scholarly activity. The Doctor of Philosophy degree normally requires a minimum of 48 course credits beyond the Bachelors degree and the completion of an acceptable dissertation. The doctoral dissertation is expected to be an original and significant contribution to the chosen area of research.

University of Wisconsin-Madison offers equal opportunities for admission and employment.

RESEARCH PROGRAMS

Departmental research programs are diversified to meet the needs of industry, society and faculty and student interests. Students are encouraged to develop projects of interest to them in close consultation with their graduate advisors. Summarized below are some areas where research is currently underway.

Bio-Processing and Food Engineering:

- Nondestructive techniques for evaluating quality of foods
- Physical properties and structure/function relationships of foods
- Cleaning and sanitation of food processing equipment
- Properties affecting aerobic stability and breakdown of protein in silage
- Solid-liquid separation for agricultural products and wastes
- Milking biomechanics
- Value added processing of crop materials
- Post-harvest processing

Machinery Systems:

- Development and evaluation of tillage systems
- Harvesting and storage losses associated with forage
- Milking machine performance standards and test methods
- Soil compaction
- Measurement and control of manure application rate
- Sensors for measuring forage crop yield for site-specific crop management
- Post-harvest processing systems

Natural Resources and Environment:

- On-site domestic sewage treatment systems
- Impact of plants on water erosion processes
- Design and development of pesticide handling facilities
- Constructed wetlands for treatment of waste
- Evaluation of construction site erosion control practices

Electrical Power and Energy Systems:

- Effect of electrical environment on dairy cows
- Energy conservation of Wisconsin farms
- Energy load management for irrigation systems

Safety and Health:

- Agricultural health promotional systems
- Development of safety enhancement computer tools
- Farm injuries involving motor vehicles
- Safety equipment on farm machines
- Ergonomics on dairy farms

Structural Analysis and Construction:

- Structural analysis of mechanically laminated wood assemblies and metal-clad wood-frame diaphragms
- Construction management - Effects of workforce level on labor productivity
- Construction tolerances and specifications.

Annual summaries of all research conducted in the Department may be obtained by contacting the Biological Systems Engineering Department, 460 Henry Mall, Madison, WI 53706