Biological and Agricultural Engineering (BAEG)

Faculty
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Yanbin Li, Professor
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Degrees Conferred:
M.S.B.E. (BENG) in Biological Engineering
M.S.En.E. (ENE) in Environmental Engineering, in collaboration with Civil Engineering (See Environmental Engineering)
M.S.E. (BENG) in Engineering (See Engineering)
Ph.D. (BENG) in Engineering (See Engineering)

Biological Engineering (BENG) (M.S.B.E.)

Primary Areas of Faculty Research:
The department’s mission: Healthy People, Healthy Planet. Biological engineers improve people’s lives today and help assure a sustainable quality of life for tomorrow. They create solutions to problems by coupling living systems (human, plant, animal, environmental, food, and microbial) with the tools of engineering and biotechnology. The primary areas of faculty research include:

Biotechnology Engineering – biotechnology at the micro- and nano-scale, food processing, food safety and security, developing new products from biomaterials, biotransformation to synthesize industrial and pharmaceutical products, bioinstrumentation, bio-nano interfacing and molecular self-assembly, bio-nano plasmonics, and bio-nano sensing.

Ecological Engineering – integrates ecological principles into the design of sustainable systems to treat, remediate, and prevent pollution to the environment. Applications include mathematical modeling of watershed process, stream restoration, watershed management, water and wastewater treatment design, ecological services management, urban greenway design and enclosed ecosystem design.

Prerequisites to the Degree Program: Admission to the M.S.B.E. program is a three-step process. First, the prospective student must be admitted to graduate standing by the University of Arkansas Graduate School. Second, the student must be accepted into the department’s program which depends on transcripts, recommendations, a statement of purpose, and the following additional requirements:

1. A GRE score of 301 or above (verbal and quantitative).
2. A TOEFL score of at least 550 (paper-based) or 213 (computer-based) or 80 (internet-based). This requirement is waived for applicants whose native language is English or who earn a bachelor’s or master’s degree from a U.S. institution.
3. A member of the faculty who is eligible (graduate status of group II or higher) must agree to serve as the major adviser to the prospective student.

Third, the prospective students will only be admitted to the M.S. programs provided engineering competence can be demonstrated by satisfying one of the following criteria:

1. Receipt of a B.S. degree in engineering from a program accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) or equivalent.
2. Students not possessing engineering undergraduate degrees often pursue graduate degrees in Biological Engineering. Students without an ABET-accredited engineering degree (or equivalent) can be admitted to the program, but must earn credit for 18 hours of engineering course work in addition to Master’s requirements (additional hours may be required for prerequisites). See details of coursework under the Degree Requirements in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at http://baeg.uark.edu/.
3. In addition to the requirements of the Graduate School, admission to the departmental aspect of the Ph.D. program depends strongly on the judgment of the individual professor who will serve as the graduate adviser. The minimal admission criteria are: 1) a GRE score of 301 or above (verbal and quantitative), 2) a TOEFL score of at least 550 (paper-based) or 213 (computer-based) or 80 (internet-based) (This requirement is waived for applicants whose native language is English or who earn a bachelor’s or master’s degree from a U.S. institution), 3) a member of the faculty who is eligible (graduate status of group II or higher) must agree to serve as the major adviser to the prospective student, and 4) a Master of Science degree in Engineering with a thesis. Unless the candidate has a Master of Science degree in Engineering with a thesis, however, the following admission criteria apply:

A. Students with B.S. degrees in engineering from an ABET accredited program or equivalent may be considered for the Ph.D. program based on their excellent academic records and/or outstanding research experience. Minimum guidelines are a cumulative GPA of 3.5 for undergraduate work, and a minimum GRE score of 307. The Departmental Graduate Committee will review the student’s record and make a specific recommendation to the Department Head.

B. Students with both B.S. and M.S. degrees not in engineering will be required to demonstrate engineering competence by passing all deficiency courses: See details of coursework

C. Students with a non-engineering B.S. degree may be considered for admissions into the Ph.D. program provided they meet the criteria outlined above under Admission Requirements. Otherwise, they need to start an M.S. program first. The Departmental Graduate Committee will make a specific recommendation to the Department Head. Also, students must demonstrate engineering competence by passing all deficiency courses.

Detailed requirements are in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at http://baeg.uark.edu/.

Requirements for the Master of Science Degree: (Minimum 30 hours)
In addition to the requirements of the Graduate School and the graduate faculty in Engineering, the following departmental requirements must be satisfied for the M.S.B.E. degree:

1. Candidates are required to complete not less than 24 semester hours of course work acceptable to the committee and a minimum of six semester hours of thesis.
2. The minimum acceptable grade on a graduate course is “C.”
3. Prior to acceptance into the program a candidate must, in consultation with the department head, identify a professor who is willing to serve as the major professor. During the first semester, the candidate must, in consultation with the major professor and department head, select a graduate committee. The candidate will, in consultation with the committee, prepare a written graduate program of study that will achieve the candidate’s objectives.
4. Candidates must prepare a paper suitable for submission to a refereed journal from research done for a thesis or BENG 500V.

Detailed requirements are in the Biological and Agricultural Engineering Department Graduate Student Handbook, available at http://baeg.uark.edu/.

Requirements for the Doctor of Philosophy Degree: In addition to the requirements of the Graduate School, the department follows the College of Engineering’s requirements with an additional requirement.

1. All students must complete a minimum of 78 semester hours of graduate-level credit beyond the engineering bachelor’s degree, including a minimum of 48 semester hours of course work and a minimum of 30 semester hours of dissertation research credits.
2. A minimum of 30 semester hours of course work must be at the graduate level (5000 or above).
3. Upon recommendation of the student’s advisory committee, a student who has entered the Ph.D. program after a master’s degree in engineering may receive credit for up to 30 semester hours. If the 30 hours includes master’s thesis research, the advisory committee may credit up to 6 hours of thesis research toward the minimum dissertation research requirement.
4. Complete a minimum of nine semester credit hours of coursework in a set of coherent courses in a related subject area approved by the student’s advisory committee.
5. Earn a minimum cumulative grade-point average of 3.0 on all graduate courses attempted.
6. Satisfactorily pass a written qualifying exam no later than the first time it is offered after the student has completed his/her first semester of graduate coursework at the University of Arkansas. The purpose of the written qualifying exam for Ph.D. students is to ensure the student has met minimum competency in the broad area of Biological Engineering and will be capable of teaching a sufficient breadth of the core undergraduate courses and upper level undergraduate courses in his/her area of expertise within Biological Engineering. If the student fails the qualifying exam, she/he has the opportunity to retake the exam or sections of the exam once.
7. Satisfactorily pass both a written and oral candidacy examination (Note that the Engineering College defines this examination as a qualifying examination). The purpose of the written and oral candidacy exam is to ensure the student has met a depth of competency in a narrowly focused area of specialization sufficient to understand and advance the current state of the art. After completing approximately two years of graduate study beyond the M.S. degree or equivalent, and at least one year before completing any other requirements, the prospective candidate must take the candidacy examination. Candidacy exam will be given by the student’s advisory committee. Students may retake a failed candidacy exam once, contingent upon approval of the student’s advisory committee. A student who fails the candidacy examination twice will be terminated from the program.
8. Complete and defend a dissertation on some topic in the student’s major field of study.
9. Satisfactorily pass a final comprehensive oral examination.

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