

GRADUATE STUDENT REQUIREMENTS AND POLICIES
DEPARTMENT OF BIORESOURCES ENGINEERING
UNIVERSITY OF DELAWARE
NEWARK DELAWARE
Effective September 1, 2007

(Approved by the University Faculty Senate Graduate Studies Committee , ?, 2007)

The Department offers a program leading to the Master of Science (MS) in Bioresources Engineering. Graduate students in the program may focus on Natural Resources Engineering or another suitable area within the discipline. Each candidate's program is planned with the help of the advisor and graduate committee. The MS degree will prepare engineers for pursuit of the PhD and careers in industry and government.

ADMISSION REQUIREMENTS

The following criteria will apply to the students admitted:

- a. A BS in engineering or related field.
- b. An undergraduate index of 2.8 overall and 3.0 in their major field of study out of 4.0 or the equivalent.
- c. A combined score of 1050 on the verbal and quantitative portions of the GRE.
- d. A paper-based TOEFL score of at least 550 (or 213 computer-based) is required for non-native English students.
- e. Three letters of recommendations that address the student's likelihood of successfully completing graduate education.

Students who do not meet all of these criteria may be admitted on a provisional basis subject to approval and completion of subject area deficiencies as indicated by the Department Graduate Studies Committee.

Applicants for admission must submit one official transcript of all previous college records, provide a statement of objectives and interests and three letters of recommendation to the University Office of Graduate Studies. Applications for fellowship, tuition scholarship or assistantship financial aid are part of the admission application form and is made at the time of application. Applications being considered for financial support should be completed by February 1 for entering summer and fall terms and by November 1 for entering spring term. For further details contact the Department Chair.

GRADUATE COMMITTEE

The graduate committee for the MS should consist of the student's major advisor, one other faculty member from inside the Department and one expert from outside the Department. The committee should represent the area of emphasis of the student's intended area of specialization and research.

Before an applicant is admitted to the program, a faculty member must agree to serve as the major academic advisor for the student's committee. The student in consultation with the advisor will form a graduate committee by the end of the first term. The graduate committee will be approved by the Department Chair and should be confirmed by memo from the advisor to the student with copies to the committee members and student's file. The student may request in writing to the Department Chair that changes be made in the graduate committee at a later date. A committee meeting should be held as soon as possible to help plan the student's programs of course work and research. An official plan of study should be developed within the first semester and approved by the graduate committee.

Maintenance of steady, reasonable progress towards the degree is the responsibility of the student and advisor. Regular meetings with the graduate committee are strongly encouraged and are required at least once a year. The student's advisor is responsible to maintain a checklist to record completion of individual requirements for graduate study. Any shortcomings in progress will be communicated in writing by the major advisor to the student and to the University Office of Graduate Studies.

MASTER OF SCIENCE REQUIREMENTS

A minimum of 30 credits is required for the Master of Science degree. It is to include 24 credits of approved course work and 6 credits of thesis BREG 869. Of the 24 credit hours of approved course work, at least 3 credits must be a statistics or advanced math course. Only graduate level courses (500 – 599), (600 - 699), (800 - 899) are applicable towards the course requirements. Selection of courses will be done in consultation with the chair of the graduate committee based upon the student's interest and area of research. The Department will offer students the opportunity to select Natural Resources Engineering or another focus area of Bioresources Engineering as their interest area and area of research. The awarding of the Master of Science degree is also contingent upon an approved research proposal, the successful oral defense of the research performed and an acceptable thesis.

All students enrolled in the program will be required to take BREG 631 Experimental Methods for Engineers and a graduate level advanced mathematics or statistics course.

Students may choose from the following list including, but not limited to:

- CIEG 601 Introduction to the Finite Element Methods
- CIEG 605 Intermediate Topics in Finite Element Analysis
- MATH 503 Advanced Calculus for Applications
- MATH 508 Introduction to Complex Variables and Applications
- MATH 535 Introduction to Partial Differential Equations
- MATH 611 Introduction to Numerical Analysis and Scientific Computing
- MEEG 891 Advanced Engineering Mathematics

STAT 601 Probability Theory for Operations Research and Statistics
STAT 611 Regression Analysis
STAT 635 Statistical Quality Control
STAT 657 Statistics for Earth Scientists

Students in the Natural Resources Engineering focus area will have to take two of the following courses:

BREG 621 Nonpoint Source Pollution
BREG 622 Watershed Modeling
BREG 628 Natural Wastewater Treatment Systems
CIEG 636 Biological Aspects of Environmental Engineering
CIEG 698 Groundwater Flow and Contaminant Transport

Students interested in developing a focus in another aspect of Bioresources Engineering can propose an alternate program of study approved by their graduate committee.

Graduate students must maintain a minimum GPA of 3.00 to remain in good academic standing. GPA requirements are monitored by the Office of Graduate Studies according to the Graduate Studies Academic Probation Policy.

Thesis Requirement

By the end of the first year (preferably in the first 6 months) of graduate study, candidates must submit to their committee for review and approval, a written research proposal describing the intended thesis research. The proposal should include a review of the pertinent literature, the methods and procedures of the research and a timetable for completion. The proposal may be refined if necessary. If there is a major shift in emphasis of the research, the proposal should be amended with the advice and consent of the committee.

The thesis should reflect the student's ability to conduct independent scholarly research and to report the results in a manner worthy of publication. It must conform to the University's Thesis and Dissertation Manual (available on the University web site under graduate student academic policies) as to format and other mechanics

The student may register for Master's Thesis (BREG 869) during any term or terms to accumulate the required 6 credit hours. The student will receive a temporary grade of S or U until successful completion of the thesis, when the advisor will record a letter grade.

A thesis defense will be conducted by the student's committee. The student will provide each member of the committee with a refined (but not final) draft of the thesis at least two weeks before the thesis defense. The date of the defense should precede the University deadline for thesis submission by at least two weeks to allow sufficient time for any required changes.

FINANCIAL SUPPORT

A. Assistantships and Fellowships

Graduate students in good standing may receive financial support from a research assistantship, teaching assistantship or fellowship. Graduate students on an assistantship or fellowship are expected to give their full-time attention to graduate study and may not engage in any remunerative employment while holding the assistantship or fellowship.

Research Assistantships: Students work on faculty projects for 20 hours per week. Assignments are made by the Chair, subject to the approval of the faculty(s) member directing the research project. Students on research assistantships are expected to enroll in a minimum of 9 credits per semester until the course requirements for the degree are fulfilled. After completing the course requirements, students on research assistantships may enroll for a minimum of 6 credits or sustaining.

Teaching Assistantships: Students assist in teaching undergraduate courses. Students may be expected to prepare and grade homework, laboratory reports and exams under the supervision of the instructor, handle routine class administrative procedures, laboratory classes and counsel and tutor individual students where necessary. In no case will the total workload exceed 20 hours per week. Students should view this as an opportunity to enhance their knowledge and to develop teaching skills at the college level. Assignments are made by the Department Chair, after consultation with faculty member(s) in charge of the course(s).

Fellowships: College or University Fellowships are reserved for outstanding students who are mostly in the advanced stages of their graduate career to support thesis research. Students holding a fellowship must register for 9 credits each semester.

B. Procedure for Nominating and Awarding Assistantships

Applications for Fellowships and Assistantships: Students wishing to be considered for nomination for a fellowship or assistantship should so indicate on their application for admission. Nominees must have a cumulative grade index of at least 2.8 in undergraduate courses for incoming students and 3.0 in graduate courses for continuing students. Fellowships and assistantships become available at various times of the year. Students should contact the Department Chair concerning their availability.

Awarding of Assistantships: Graduate research assistantships and teaching assistantships for qualified students are awarded by the Department. When possible, announcement of graduate research assistantships will be made by April 1 for fall semester and November 1 for spring semester. Students entering in the fall may begin working and receiving research assistantships in summer months. Other awards will be made by June 1 for the fall semester and December 1 for spring semester.

Retention of Assistantships: Awardees hold assistantships for one year. Assistantships will be reviewed by the end of April of the first year and evaluated for renewal. The review and evaluation for renewal will be conducted by the Department Chair and the

student's advisor. Review and evaluation of teaching assistantships should include input from the entire teaching faculty. The Department Chair will initiate the review.

TIME LIMIT

The University requires that the master's degree be completed within ten consecutive semesters. Students who devote full time to their program should earn the master's degree within two to two and a half years.

EFFECTIVE DATE AND NOTIFICATION TO STUDENTS

The requirements and guidelines stated herein are in effect for students entering the graduate program as of September 1, 2007.

All students applying for admission should receive this set of guidelines and information. Faculty advisors should be sure each of their graduate student advisees has a copy and is aware of these requirements. Copies are available in the Department office. Students are responsible for being familiar with the University Academic Regulations for Graduate Students published in the Graduate Catalog.