

**The University of Georgia  
Biological and Agricultural Engineering  
Graduate Program Handbook**

Rev. August 2009

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# Chapter 1

## Introduction

Welcome to the University of Georgia and the Department of Biological and Agricultural Engineering! This handbook was approved by the faculty of the department and is designed to serve as a guide for applicants, graduate students and faculty to the degree requirements, policies and procedures of the department's Doctor of Biological and Agricultural Engineering, Master of Agricultural Engineering and Master of Biological Engineering degree programs.

The information provided in this handbook is consistent with Graduate School guidelines and should provide information regarding nearly all your questions about program policies and degree requirements. However, there could be circumstances where additional detail is needed. In these instances, consult the graduate bulletin, located at <http://www.uga.edu/gradschool/bulletin/>. If you are still unclear about something, please ask! You may direct your inquiries to the Engineering Academic office: [gradprog@engr.uga.edu](mailto:gradprog@engr.uga.edu). Further information about the Engineering Academic office can be found under Program Administration.

## **Chapter 2**

### **Important Deadlines and Events**

To assist in your timely progress toward your graduate degree, this chapter provides you with information and timetables of the steps to be taken each semester from application to completion of your PhD or MS degree. Links to the appropriate procedures or forms are included for your convenience.

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

### 2.1 Applying for Admission

#### 2.1.1 Admission Requirements

The department accepts applications from graduates having a bachelors and/or masters degree in engineering, physics, chemistry, biological sciences, mathematics, food science and agricultural sciences from recognized US and foreign institutions. Qualified applicants with a degree in the above mentioned non-engineering areas are frequently admitted under the condition that they will satisfactorily complete prescribed undergraduate engineering science courses as a part of their program of study.

Generally, applicants with BS degrees will be admitted as MS degree candidates; however, those with demonstrated research proficiency may be admitted directly into the PhD program, bypassing the MS degree.

#### 2.1.2 Proficiency (Make-up) Courses

When a candidate meets the stipulated performance standards for admission, background knowledge in Biological and Agricultural Engineering will be evaluated at the time of admission by the Department Graduate Committee, and admission may be recommended with a list of required make-up courses. Once enrolled, the student's Major Professor and Advisory Committee will evaluate the candidate's preparedness and may modify the list of make-up courses initially recommended by the Department Graduate Coordinator at the time of granting the admission. These changes must be approved by the Graduate Coordinator. The student **MUST** obtain at least a grade of B in all make-up courses.

Deficiencies may be satisfied by either completing recommended courses or by passing a placement examination administered by the Department Graduate Committee using questions solicited by the committee from instructors of the courses. Each candidate must have a satisfactory knowledge of engineering sciences and a field of biology if appropriate. Appendix C provides reference to aid in course selection in the engineering sciences, the biological sciences, ecological sciences and the veterinary sciences.

#### 2.1.3 Application Procedures

Most often, initial contact with a prospective student for graduate studies is made by a faculty member, the Graduate Coordinator or the Graduate School Admissions Office. If contact is first made by a faculty member, he/she is encouraged to immediately inform the Graduate Coordinator who, in cooperation with the Student Affairs Professional, supply the prospective student with instructions and information about the department's graduate program.

**Please note: The application deadline for engineering programs differs from that of the Graduate School!** Because the department prefers to admit students for the fall semester, **complete applications (see below) must be received by January 31 for the following fall semester.** Admissions beginning other semesters may be entertained under special circumstances (e.g., funded projects with non-fall start dates).

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

A complete application includes the following:

- University of Georgia Graduate School Application.
- G.R.E. Scores obtained within the last five years.
- Official transcripts of colleges and universities attended. When the original transcript is in a foreign language, attested translated copies of the transcript in English are required.
- Three letters of reference by persons familiar with your academic credentials, training and research potential.
- A one-page resume.
- An application for assistantship (if desired).

Foreign applicants must also provide the following:

- TOEFL Score (taken within last two years). Please be aware that the Graduate Coordinator may contact you for a telephone interview for further evaluation of your communication skills.

A step-by-step guide to the application process is provided below:

WHAT	WHEN	LINK/MAILING ADDRESS
Submit Online Application	Receipt Deadline: January 31	<a href="http://www.uga.edu/gradschool/admissions/requirements.html">http://www.uga.edu/gradschool/admissions/requirements.html</a>
Submit 3 Letters of Reference to Graduate Coordinator	Receipt Deadline: January 31	Submitted through online application process (recommended) or by e-mail or mail using Letter of Recommendation Form.  For instructions and links see: <a href="http://www.uga.edu/gradschool/admissions/requirements.html">http://www.uga.edu/gradschool/admissions/requirements.html</a>
Submit GRE and TOEFL Scores	Receipt Deadline: January 31	Scores to be sent directly to the Graduate School from the testing agency. The UGA institutional code for ETS reporting: <b>5813</b> (See above link for more information)
Submit Official Transcripts from all schools (except UGA) to UGA Graduate School	Receipt Deadline: January 31	The University of Georgia Graduate School 320 E. Clayton Street, Suite 400 Athens, GA 30602-4401  For more information, see website: <a href="http://www.uga.edu/gradschool/admissions/requirements.html">http://www.uga.edu/gradschool/admissions/requirements.html</a>
Submit 1-page resume to Graduate Coordinator	Receipt Deadline: January 31	Send by e-mail (preferred) to: <a href="mailto:gradprog@engr.uga.edu">gradprog@engr.uga.edu</a>  Or by mail to: Graduate Coordinator Engineering Academic Office Driftmier Engineering Center The University of Georgia Athens, GA 30602-4435
Submit Application for Assistantship	Receipt Deadline: January 31	Link to Application: <a href="http://www.engr.uga.edu/student_resources/grad_asst_form.html">http://www.engr.uga.edu/student_resources/grad_asst_form.html</a>

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

### 2.1.4 Application Evaluation Procedure

All applications for admission are evaluated by the Department Graduate Committee. The Graduate Coordinator will receive recommendations from each committee member individually. The Committee may choose to set limits and authorize the Graduate Coordinator to act without receiving members' recommendations when the applicants are either clearly qualified or not qualified. Based on the recommendations from the Committee, the Graduate Coordinator will forward the recommendation of the Department to the Graduate School regarding admission. The Graduate School Dean makes the final decision and notifies the candidate and the Graduate Coordinator.

The following set of criteria will serve as a guide to the Department's Graduate Committee in the admission process. Potential candidates are evaluated on:

- Grade Point Average—Graduate  $\geq 3.5/4.0$ ; Undergraduate  $\geq 3.0/4.0$
- GRE Scores—Verbal  $> 450$ ; Quantitative  $> 650$ ; Analytical  $> 3.5$
- Three letters of reference
- TOEFL Score (foreign students)—paper-based minimum 550;  $> 590$  preferred; computer based minimum 213; internet based minimum 80; speaking 20, writing 20
  - TAST Score (foreign students)—minimum 26.
- Transcripts are evaluated for evidence of an engineering or quantitative science background. Prospective students not having an engineering science background may be admitted with or without assistantship with stipulations to include selected extra undergraduate courses in their plan of study.

**Please note: Competition among applicants is keen!** The above guidelines do not reflect the actual scores of current admitted students:

Average of Students Admitted Fall 2009:

Average Graduate GPA: 3.94

Average Undergraduate GPA: 3.27

GRE Scores: Verbal: 465

Quantitative: 633

For more information about the admissions process, please visit the UGA Graduate School website:

<http://www.grad.uga.edu/>

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

### 2.2 PhD Student Timeline for Completion of Program

#### 2.2.1 Every Semester

WHAT	WHEN	HOW
Register	Continuing students must register during Early Registration.	For registration instructions, deadlines, course schedules and, academic calendar go to: <a href="http://www.reg.uga.edu/or.nsf/html/registration">http://www.reg.uga.edu/or.nsf/html/registration</a>  To register: <a href="https://oasisweb.uga.edu/">https://oasisweb.uga.edu/</a>
Pay Tuition	By tuition payment deadline.	For information about fee payment and deadlines, go to: <a href="http://www.bursar.uga.edu/">http://www.bursar.uga.edu/</a>
Midterm Withdrawal	See Academic Calendar for withdrawal deadline.	For Academic Calendar, go to: <a href="http://www.reg.uga.edu/or.nsf/html/Academic_Calendar">http://www.reg.uga.edu/or.nsf/html/Academic_Calendar</a>
Domestic Fellowship Application —1 <sup>st</sup> & 2 <sup>nd</sup> year US students	All semester	Apply for external fellowships—NSF, NDSEG, DOE, etc. For information: <a href="http://www.ovpr.uga.edu/researchnewsletter/index.html">http://www.ovpr.uga.edu/researchnewsletter/index.html</a>
Domestic Fellowship Application —3 <sup>rd</sup> & 4 <sup>th</sup> year US students	All semester	Apply for fellowships—NIH-NRSA, AHA, etc.  For information: <a href="http://www.ovpr.uga.edu/researchnewsletter/index.html">http://www.ovpr.uga.edu/researchnewsletter/index.html</a>

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

### 2.2.2 Steps toward Completion

WHAT	WHEN	HOW
Temporary Advisor Appointed	No later than 7 days from the date admission is granted	<u>The Temporary Advisor</u>
Attend Orientation	Scheduled prior to enrollment	<u>Orientation</u>
Review Research Programs	During the first semester in residence	<u>Review Department's Research Programs</u>
Major Professor Appointed	Within the first semester in residence	<u>Major Professor Assignment</u>
Form & obtain approval of Advisory Committee	By the middle of your 2 <sup>nd</sup> semester	<u>Advisory Committee Appointment</u>
Submit approved Preliminary Program of Study	By the middle of your 2 <sup>nd</sup> semester in residence	<u>Preliminary Program of Study</u>
Modify the Preliminary Program of Study	Whenever the changes are approved by the Advisory Committee	<u>Preliminary Program of Study</u>
Qualifying Written Exam	By the end of your 3 <sup>rd</sup> semester	<u>Qualifying Exam</u>
Submit approved Final Program of Study	Immediately following the qualifying exam	<u>Final Program of Study</u>
Present Dissertation Research Proposal	By the end of your 4 <sup>th</sup> semester	<u>Dissertation Research Proposal</u>
Apply to Candidacy	No later than 2 semesters prior to graduation	<u>Admission to Candidacy</u>
Apply for Graduation	2 semesters prior to graduation	<u>Application for Graduation</u>
Announce Oral Defense; Present Seminar	No later than 3 weeks prior to Final (Oral) Defense	<u>Announcement and Seminar</u>
Distribute Dissertation	3 weeks prior to Final (Oral) Defense	<u>Distribution of Dissertation</u>
Oral Defense		<u>Final (Oral) Examination</u>
Approval of Final Examination	No later than the last day of classes of the semester following the oral defense	<u>Final (Oral) Examination</u>

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

### 2.3 Masters Student Timeline for Completion of Program

#### 2.3.1 Every Semester

WHAT	WHEN	HOW
Register	Continuing students must register during Early Registration.	For registration instructions, deadlines, course schedules and, academic calendar go to: <a href="http://www.reg.uga.edu/or.nsf/html/registration">http://www.reg.uga.edu/or.nsf/html/registration</a> To register: <a href="https://oasisweb.uga.edu/">https://oasisweb.uga.edu/</a>
Pay Tuition	By tuition payment deadline.	For information about fee payment and deadlines, go to: <a href="http://www.bursar.uga.edu/">http://www.bursar.uga.edu/</a>
Midterm With-drawal	See Academic Calendar for withdrawal deadline.	For Academic Calendar, go to: <a href="http://www.reg.uga.edu/or.nsf/html/Academic_Calendar">http://www.reg.uga.edu/or.nsf/html/Academic_Calendar</a>
Domestic Fellowship Application —1 <sup>st</sup> & 2 <sup>nd</sup> year US students	All semester	Students interested in pursuing a PhD apply for external fellowships—NSF, NDSEG, DOE, etc. For information: <a href="http://www.ovpr.uga.edu/researchnewsletter/index.html">http://www.ovpr.uga.edu/researchnewsletter/index.html</a>
Domestic Fellowship Application —3 <sup>rd</sup> & 4 <sup>th</sup> year US students	All semester	Students interested in pursuing a PhD apply for fellowships—NIH-NRSA, AHA, etc. For information: <a href="http://www.ovpr.uga.edu/researchnewsletter/index.html">http://www.ovpr.uga.edu/researchnewsletter/index.html</a>

## CHAPTER 2. IMPORTANT DEADLINES AND EVENTS

### 2.3.2 Steps Toward Completion

WHAT	WHEN	HOW
Temporary Advisor Appointed	No later than 7 days from the date admission is granted	<u>The Temporary Advisor</u>
Attend Orientation	Scheduled prior to enrollment	<u>Orientation</u>
Review Research Programs	During the first semester in residence	<u>Review Department's Research Programs</u>
Major Professor Appointed	Within your first semester in residence	<u>Major Professor Assignment</u>
Form & obtain approval of your Advisory Committee	By the middle of your 2 <sup>nd</sup> semester	<u>MS Advisory Committee Appointment</u>
Submit Program of Study	By the middle of your 2 <sup>nd</sup> semester in residence	<u>MS Program of Study</u>
Modify the Program of Study	Whenever the changes are approved by the Advisory Committee	<u>MS Program of Study</u>
Present Thesis Research Proposal	By the end of your 3 <sup>rd</sup> semester	<u>Thesis Research Proposal</u>
Apply for Graduation	2 semesters prior to graduation	<u>Application for Graduation</u>
Announce Oral Defense	No later than 3 weeks prior to Final (Oral) Examination	<u>Announce Oral Defense</u>
Distribute Thesis	2 weeks prior to Final (Oral) Defense	<u>Review</u>
Prepare Journal Article Manuscript Draft	Prior to scheduling of Final Exam	<u>Journal Article</u>
Final Exam & Oral Defense		<u>Final Exam and Oral Defense</u>
Approval of Final Examination	No later than the last day of classes of the semester following the oral defense	<u>Final Exam and Oral Defense</u>
Order Copies of Thesis for Library		<u>Final Exam and Oral Defense</u>

## Chapter 3

### Administrative Issues

#### 3.1 The Department of Biological and Agricultural Engineering

The Department of Biological and Agricultural Engineering (BAE) has teaching, research and extension programs. The department faculty are located at Athens, Griffin and Tifton campuses. The Department Head is the chief administrative officer. The BAE Department is contained within the College of Agricultural and Environmental Sciences and is affiliated with the Institute of the Faculty of Engineering (FE). The Faculty of Engineering is designed as an institute without borders, having approximately 100 members from many units across the UGA campus. You are encouraged to consult [www.engr.uga.edu](http://www.engr.uga.edu) for additional departmental information and [www.engineering.uga.edu](http://www.engineering.uga.edu) for additional information pertaining to the Faculty of Engineering. See Appendix A for links to BAE and FE faculty information.

The undergraduate and graduate classroom instruction is provided primarily in the Driftmier Engineering Center in Athens, although courses may be in other classrooms around campus or from distant locations via distance learning. FE members are becoming increasingly engaged in providing engineering instruction at UGA. The Department's research program is conducted from all three locations (i.e. Athens, Griffin, and Tifton), and extension faculty are located across the state.

#### 3.2 Program Administration

The graduate program of the department is administered by the BAE Graduate Coordinator who also serves as a liaison between the department and the Graduate School. The Graduate School approves all actions related with the graduate programs. Students and faculty must invite the Graduate Coordinator to all meetings and keep him/her informed of progress toward completion of the degree.

Support to the Graduate Coordinator is provided by the Academic Office located in Room 120 of the Driftmier Engineering Center. Questions for the Graduate Coordinator may be directed to this office in person, by telephone (706) 542-0860 or by email: [gradprog@engr.uga.edu](mailto:gradprog@engr.uga.edu)

#### 3.3 Research Locations and Facilities

The selection of the Major Professor and research area will determine the location for the research portion of the program. The primary research location will normally be either at the main UGA campus in Athens, the UGA campus in Tifton or the UGA campus in Griffin. Under special circumstances, the primary research location may be at cooperating institutions such as the Environmental Protection Agency, and the USDA Agricultural Research Service.

See Appendix B for further information regarding the teaching and engineering research facilities located on the three campuses of the University of Georgia, College of Agriculture.

## *CHAPTER 3. ADMINISTRATIVE ISSUES*

### **3.4 Committees**

The following committees guide the processes of the BAE graduate program.

#### **3.4.1 Department Graduate Committee**

The Department Graduate Committee plays a decisive role in admission and assistantship decisions, evaluations and recommendations for degree program and examination administration or scoring. The Committee is comprised of four faculty members representing each of the campuses with two representing Athens and one student. It is chaired by the Graduate Coordinator and members are appointed by the Department Head.

#### **3.4.2 Advisory Committee**

The Advisory Committee is responsible for advising, examining and approving all facets of the student's progress. The composition of the committee's members varies depending on the degree program of the student. For information specific to your degree program, please see either [Masters Advisory Committee Appointment](#) or [PhD Advisory Committee Appointment](#).

#### **3.4.3 Appeals Committee**

The Appeals Committee evaluates cases in which a PhD student has failed the [Qualifying Exam](#) a second time and determines whether the student should remain in the PhD program or become an MS student. Appeals Committee members are appointed to a 2-year term by the Department Head.

### **3.5 Assistantships**

Financial support for graduate students is available on a competitive basis. The available funds from state and federal allocations and from sponsored research programs are allocated competitively. If financial support is desired, the applicant should complete and submit an [Application for Assistantship Form](#) directly to the department when the application to the Graduate School is submitted. In general, applications must be received by January 31 for award of an assistantship starting fall semester (August). Award of assistantships may be made throughout the year based upon the availability of funds.

#### **3.5.1 General Information**

Assistantships are generally awarded for July through June on an annual basis. Renewal of the assistantship is dependent upon the availability of funds and sufficient academic progress on the part of the student to warrant continuation of support. Assistantship rates are determined by the Department Head, in consultation with the Graduate School.

Students on assistantship may be asked to assist professors in various research, teaching and extension-outreach responsibilities, with thesis research being the predominant responsibility. Teaching-related duties may be responsibilities such as grading, occasional guest lectures and laboratory coordination. Extension-outreach duties may include duties such as assisting with various workshops. All masters students on assistantship are asked to assist in proctoring undergraduate computer labs.

## CHAPTER 3. ADMINISTRATIVE ISSUES

### 3.5.2 Travel

BAE encourages the participation of graduate students in state, regional, national, and international professional meetings. To the extent possible, travel support will be provided by the Department and the Graduate School. The Major Professor should be notified four months in advance when travel to professional meetings is anticipated. The travel request is submitted to the Graduate Coordinator with the recommendation of the Major Professor.

Travel funds to conduct research project(s) will be provided by the Department or via research grant. It is imperative that an early assessment (prior to initiation of the research project) of the travel requirements be made by the graduate student and his/her Major Professor. In the event that significant travel expense is anticipated during the research, a travel budget should be prepared for review and approval by the Department Head. For in-state travel, the student must use the Departmental Travel Request Form available in the mail room and submit the form, with the Major Professor's signature, to the Department Head for approval prior to each travel event. Similarly, for out-of-state travel, the student must submit the UGA Travel Authority form at least three weeks prior to the planned travel which will be prepared by the Administrative Associate with information coming from the major professor, Graduate Coordinator, Department Head, and Graduate School if the funding is coming from them. Once the graduate student returns, reimbursement for departmentally funded travel must be submitted to the Administrative Associate within one week of returning. Please see below for instructions for travel funding provided by the Graduate School.

The following Graduate School Travel Reimbursement Procedures were copied from a handout from the Graduate Coordinator's Assistant's Workshop given by the UGA Graduate School:

This information is provided so that graduate students may obtain reimbursement of travel expenses from the Graduate School as painlessly and as quickly as possible.

**Submit a check request form, a travel expense statement, and receipts as required.** All documents should be typed. Have someone on the faculty approve the travel expense statement. Original receipts are required for lodging, common carrier, parking, and registration fees.

**The reimbursement request must be received within 30 days of your return.** Reimbursement requests received after the 30 day deadline **will be denied**. Your materials should be delivered to: 320 E. Clayton Street, Suite 400, Athens, GA 30602-4401. If your departmental secretary or bookkeeper is helping with the typing, make sure that you get your materials to her well before the deadline.

**DO NOT charge an airline ticket to the Graduate School.** You may charge to your personal credit card or to another university account if you are authorized to do so.

**Please include an extra copy of the check request information.** This copy now includes all supporting documentation—travel expense statement, receipts, letters and copy of TA.

**Consult the university's Travel Regulations and Procedures if necessary.** This document is located on the web at: <http://www.uga.edu/campuslife/services/businessoffice/stuttravel.html>

**One trip per student per fiscal year.**

## *CHAPTER 3. ADMINISTRATIVE ISSUES*

### **3.5.3 Leave Policy**

The University of Georgia policy for graduate students on assistantships or fellowships does not provide for any leave—sick, annual, or miscellaneous. However, the BAE Department allows students to negotiate time off with their Major Professor and the Graduate Coordinator.

The Department will use the following general guidelines for considering any request for time off by students on graduate assistantships or fellowships, regardless of the source of funds.

- Time off with pay is a privilege granted by the Department on the basis of performance.
- Time off may be granted for illness, hospitalization, etc. at the discretion of the Major Professor. In the absence of a major professor, such decisions will be made at the discretion of the Graduate Coordinator.
- Time off for vacation will be based upon performance. Up to 5 working days per year may be granted at the discretion of the Department Head. The student should make a written request to her/his major professor who should provide a recommendation to the Graduate Coordinator.
- In all cases, the departmental Leave Request Form must be used to request time off and appropriate records will be maintained in the departmental office.
- University approved holidays are approved for all graduate students.
- Any unapproved time off will be leave without pay.

### **3.5.4 Probationary Period**

Assistantships are initially awarded for one semester only and are extended beyond the probationary period based on satisfactory performance of assigned duties as judged by the advisor(s) and the Graduate Coordinator.

### **3.5.5 Grades**

At the end of any semester in which a graduate student's cumulative GPA for courses approved for the graduate program falls below a 3.0, the student, the student's Major Professor, the Graduate Coordinator and the Department Head shall collectively discuss the factors related to the GPA. If the student's cumulative graduate GPA at the end of the next semester is less than 3.0, the assistantship shall be discontinued.

### **3.5.6 Other Employment**

The Department considers the academic requirements and duties of assistantship responsibilities to constitute a full-time commitment under normal circumstances. Thus, please note that holding other part-time or full-time employment in the University or outside the University, without prior approval from the Department Head may result in the immediate termination of the assistantship.

## *CHAPTER 3. ADMINISTRATIVE ISSUES*

### **3.5.7 Departmental Duties**

The BAE Department may provide those holding assistantships with opportunities to assist with proctoring and teaching responsibilities from time to time. These duties will be assigned depending on availability and the preparation of the student. Please be aware that the Department views these duties as important both to your academic experience and the operation of the Department. If assigned duties are repeatedly not performed, disciplinary action will result.

### **3.5.8 UGA Right to Know Training**

In accordance with the Public Employee Hazardous Chemical and Right to Know Act of 1988 enacted by the State of Georgia, the University of Georgia has developed a policy and plan to ensure that employees are protected from hazardous chemicals that may be encountered in the workplace. University policy requires that all students on assistantship complete the university's Right to Know training available online at: <http://www.busfin.uga.edu/rtk/RTKTrain3.html>

## **3.6 Use of Departmental Facilities**

### **3.6.1 Office and Lab Space**

Appropriate office space and furniture (i.e., desk, file drawer, etc.), are provided to all incoming Graduate Students until lab accommodations, that meet the unique needs of the research project, become available and are provided by the Major Professor. The Graduate Coordinator, who will work with the Department Head and the Major Professor to make appropriate arrangements, should be notified of any unique needs.

### **3.6.2 Keys**

The Department will issue keys to the building and to appropriate labs and offices within the building. These keys are not to be duplicated or loaned to others. They must be returned to the departmental office (Room 101) before leaving. Please be aware that failure to abide by the policy relating to keys may result in disciplinary action. Failure to turn in keys when terminating your assistantship may result in your check being withheld.

### **3.6.3 Computers and Printers**

Computers and printers are provided for students in the Graduate Offices (Room 607) and in some labs and other offices. For technical assistance, or to request additional software, contact the Systems Administrator at (706) 542-4816 or [support@engr.uga.edu](mailto:support@engr.uga.edu).

BAE provides paper and toner for printers. So that the department can continue to provide paper and toner for students, students are asked to use paper prudently. That is, print only research related materials and then, only the section of the document under revision rather than the entire document.

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### 3.6.4 Mail Service and Email Policy

Graduate students are each provided with a mail box in the Driftmier mailroom located in Room 202. Additionally, students in the BAE Graduate Program are required to create a UGAMail e-mail account which is provided at no cost to you upon enrollment. For information about UGAMail, or to set up your account, go to: <http://www.ugamail.uga.edu/index.html>

**Please note: It is important that you pick up your mail regularly and check your UGAMail account daily as the department and university rely on mail and email for official communication.**

### 3.6.5 Departmental Vehicles

Graduate students who are employed by the university and who possess a valid drivers license are eligible to check out departmental vehicles for official local, in-state and out-of-state travel.

Vehicle reservations are made in the Research Machine Shop (Lab 335). To reserve a vehicle, students must:

1. Obtain the permission of their major professor
2. Complete required State Vehicle Usage Forms\*
3. Check the availability of vehicles and complete a reservation slip for an appropriate vehicle

\*Students may be required to demonstrate driving proficiency

When picking up a vehicle:

1. Complete the sign-out form in the Research Machine Shop
2. Obtain a university hangtag for on-campus parking (if needed) from your major professor
3. Check fuel levels—The University Fuel Depot, located on Riverbend Road, is open from 7 a.m. to 11 p.m., Monday through Friday. A WEX card and pin are needed. Each vehicle will have a card. To determine your pin, please go to: <http://vehicle.ppd.uga.edu>

While traveling:

1. Students are expected to obey all traffic laws. **Any violations or fines are the responsibility of the student!**
2. **All accidents or incidents are to be reported as soon as possible.** See Section 3.8 for further instructions.
3. The university provides vehicle insurance for official university business only. **The university does not cover claims for vehicle damage or injuries sustained by unauthorized drivers or passengers or while not on official business.**

## *CHAPTER 3. ADMINISTRATIVE ISSUES*

When returning the vehicle:

1. Check that fuel levels are at least at half-full
2. Enter date returned on the check-out sheet
3. Report any mechanical problems to the Electronics Technician
4. Return the key to the proper location
5. Return hang-tag
6. Turn in Fuel Account Sheets to the Accounting Assistant (Room 203)
7. Turn in completed Travel Expense Statement and receipts to Accounting Assistant

The departmental motor pool is overseen by the Electronics Technician (706) 542-6764.

### **3.6.6 Purchasing**

With the approval of the major professor, students may purchase research materials.

Please consult your Major Professor or the Administrative Associate in Room 101 for instructions.

### **3.6.7 Research Machine Shop**

The Research Machine Shop is located in Lab 335 which is the building beyond the rear of the “300” hallway. The shop is equipped for the following:

- Sheet metal fabrication
- Precision metal fabrication
- Metal welding
- Wood and plastic fabrication

Students should arrange to use the shop facilities through their major professor. However, students may use the facilities for smaller projects with the approval of the shop supervisor. Before using the equipment, each student must demonstrate that they are capable of safely using the tool(s) before permission is granted. The use of some equipment is restricted to shop personnel only.

All equipment, including hand tools, should be returned to the proper storage location and any broken or damaged equipment reported to the shop supervisor.

The telephone number to the Research Machine Shop is: (706) 542-0875.

## *CHAPTER 3. ADMINISTRATIVE ISSUES*

### **3.6.8 Photocopier**

The department provides each graduate student with an ID number enabling the use of the copy machines located in Room 201. For the department to continue to supply paper and toner, copy machines should be used sparingly and limited mostly to assistantship-related work.

### **3.7 Student Fees**

Tuition is waived for students who hold graduate assistantships. However, activity, athletic, transportation, technology and health fees are mandatory for all students and fees are subject to change. For semester information, visit the Bursar's Office website: [www.bursar.uga.edu](http://www.bursar.uga.edu)

### **3.8 Accident and Incident Reporting**

University polices require that all serious accidents or incidences be reported as soon as possible. The College of Agricultural and Environmental Sciences provides definitions and procedures at: <http://www.caes.uga.edu/intranet/policy/section5/05-01.html>

### **3.9 Files, Correspondence and Forms**

The records of all graduate students are maintained by the Student Services Professional I, under the direction of the Graduate Coordinator. All inquiries regarding the status or contents of your files should be made to the Graduate Coordinator.

Copies of all correspondence, including most forms, are required to be included in your student file. Please remember that it is your responsibility to know, and adhere to, form submission deadlines. For specific deadline dates, see <http://www.uga.edu/gradschool/academics/deadlines.html>

For general information (e.g., brochures, assistantship application forms, etc.) relating to the graduate program, please visit the Engineering Academic Office located in the Driftmier Engineering Center, Room 120.

### **3.10 Residency Requirement**

The Graduate School limits the number of transfer hours to six (6) for all Masters Program students. Therefore, all but these six hours are required to be taken at UGA.

## CHAPTER 3. ADMINISTRATIVE ISSUES

### 3.11 Change of major from MS to PhD

The Graduate School Dean requires the following if the change of objective from MS to PhD is to be approved:

1. The cumulative GRE score must be at least 1000
2. The undergraduate GPA must be 3.0 (or its equivalent)
3. A compelling case for the change must be given

The department requires a Graduate GPA of 3.5 to consider this change of major.

To develop a compelling case (item 3), the Graduate Coordinator will suggest one of the following paths:

1. Form an approved MS Committee and present a research proposal to that committee and the Graduate Coordinator, typically after 2 semesters. The student would complete a preliminary doctoral plan of study showing the graduate courses and grades of courses taken to date. The Graduate Coordinator and the committee would assess the research proposal. A funded proposal written by the student would also strengthen the case. The major professor would also provide the Graduate Coordinator with a letter of justification for the degree change. In the case of a positive MS Committee and Graduate Coordinator assessment, the Graduate Coordinator would then petition the Graduate School for the change of degree objective.
2. Present the following items to the Graduate Coordinator: Evidence of scholarly work prepared for publication in a scholarly journal and/or a funded research proposal written by the student; a preliminary doctoral plan of study and a letter of justification written by the major professor. The Graduate Coordinator would ask the appropriate Graduate Admissions committee to evaluate the material. In the case of a positive Graduate Committee and Graduate Coordinator assessment, the Graduate Coordinator would then petition the Graduate School for the change of degree objective.

### 3.12 Graduate Certificates

Certificates are recognized as an excellent way to package qualifications for various jobs in industry. Graduate students may elect to pursue certificate programs while they complete degree requirements. Certificates are available in the following areas:

#### Certificate Program

Certificate in Computer Science and Engineering  
Certificate in Engineering Physics  
Certificate in Coastal and Oceanographic Engineering  
Certificate in Atmospheric Sciences

#### Coordinator

Dr. Sidney Thompson  
Dr. E.W. Tollner  
Dr. David Stooksbury  
Dr. David Stooksbury

BAE certificates generally require 18 additional course hours, with some overlap of the MS program of study being possible. Specific details for each certificate are available from the coordinators listed above and in the BAE Website. Certificates generally require students to complete an MS (or PhD) thesis (dissertation) in the general area.

## CHAPTER 3. ADMINISTRATIVE ISSUES

The Graduate School also offers the Interdisciplinary Certificate in University Teaching for PhD students. To learn more about this certificate, go to:

[http://www.uga.edu/gradschool/academics/certificate\\_teaching.html](http://www.uga.edu/gradschool/academics/certificate_teaching.html)

### 3.13 Student Resources

#### 3.13.1 The Engineering Graduate Club

Officially named, The Graduate Club of the Biological and Agricultural Engineering Department, the club is available to all Engineering graduate students “to foster the social, educational, and professional interests of graduate students”. Incoming Graduate Students are introduced to the club at Graduate Engineering Programs Orientation.

#### 3.13.2 Professional Societies

Graduate Students are encouraged to participate in the student chapters of the following societies currently active within BAE:

- ASABE – The Society for Engineering in Agricultural, Food, and Biological Systems
- ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers
- EBE – Engineers without Borders
- SWE – Society of Women Engineers

#### 3.13.3 Counseling at CAPS

Graduate school can not only be challenging academically but socially and personally too. CAPS offers individual and group counseling as well as outreach programs addressing a wide range of topics including stress management, cultural diversity and relationship issues. For more information, visit: <http://www.uhs.uga.edu/CAPS/index.html>

#### 3.13.4 Resources for International Students

##### 3.13.4.1 The Office of International Education

International students needing help with immigration, financial help, mandatory health insurance or employment issues can get advice here. For further information, visit <http://www.uga.edu/oie/>

##### 3.13.4.2 The International Student Life Office

The International Student Life (ISL) Office at the University of Georgia serves as an *Archway to the World* for both U.S. and international students attending the University. With a number of exciting cultural programs, students and community members alike can travel around the world without leaving UGA. In addition to programs that enhance international awareness, ISL also provides orientation sessions for new international students, individual counseling, and advises approximately twenty-five international student organizations. If you questions about housing, student organizations, taxes or social issues, you may get assistance at: <http://www.uga.edu/isl/>

## Chapter 4

# Requirements for all Degrees

### 4.1 BAE Orientation

An orientation to the BAE Department is held for all new graduate students prior to the start of the fall semester. Some of the activities and topics covered during orientation include the following:

- An introduction to the Graduate Handbook and some of the policies contained herein
- Advising and registration
- Employment paperwork for those on assistantship
- Computer user and photocopier accounts
- Office space assignment
- Lab tours at the Athens Campus
- Proctoring of Undergraduate Computer Lab
- Research Machine Shop
- Departmental Vehicles

Orientation is not only an opportunity for new graduate students to familiarize themselves with the logistical aspects of graduate study; it is also an introduction to, and welcome from, the faculty, students and staff of BAE!

### 4.2 The Temporary Advisor

The Graduate Coordinator will appoint a temporary advisor no later than seven (7) days from the date admission is granted.

Responsibilities of the Temporary Advisor include:

- Consulting with the student in the preparation of a course schedule for the first semester
- Explaining information related to:
  - Expertise of faculty members and their active research programs.
  - General requirements of the Department.
  - General information about the University.
- Assisting the Graduate Coordinator in the selection and appointment of a major professor.
- Mentoring the student until a major professor is selected.

The Major Professor must be a full member of the graduate faculty; however, this is not a requirement for the Temporary Advisor.

## CHAPTER 4. REQUIREMENTS FOR ALL DEGREES

### 4.3 Course Registration

A graduate student using university facilities and/or staff time must register each semester. All students on assistantships **MUST** enroll in **ALL** semesters during the academic year, including the summer term. Also, they must register by the scheduled registration day. **Please be aware that failing to meet these requirements may result in the termination of your assistantship!** Also, please note that all students must register for the semester in which they intend to graduate.

The full-time course load is 12 hours per semester during the academic year and 9 hours during the summer. The minimum/maximum course load a student may enroll in follows:

	<u>Min.</u>	<u>Max.</u>
Students w/o assistantship	3	18
Students with assistantship		
One-fourth (.25)	9	18
One-third (.33) time	12	18
Four-ninth (.44) time	12	18
One-half (.50) time	12	18
UGA Full-time employee	3	6

### 4.4 Review of Department's Research Programs

In the first semester of residence, the student is expected to become familiar with faculty research projects in their area of interest. The Graduate Coordinator and the student arrange visits with faculty working in related areas. (See [Appendix A](#))

Please be aware that those students who are offered assistantship from a contract or grant are obligated to assist in research related to grant objectives.

### 4.5 Major Professor Assignment

The student will provide a written request to the Graduate Coordinator explaining the reasons for his/her recommendation of a major professor and set up an appointment with the Graduate Coordinator for a discussion in person. After receiving the student's input the Graduate Coordinator will, in consultation with the Department Head, appoint the student's major professor before the start of the second semester.

#### 4.5.1 Responsibilities of the Major Professor

The major professor will serve as a mentor, cooperater, encourager, critic, and friend to the graduate student. The major professor will identify the strengths and the weaknesses of the student and assist the student in achieving his/her goals. It is thus a task not to be taken lightly. If the program is conducted successfully, the major professor and student will learn from each other. With input from the major professor, the student will begin the process of selecting a research topic, advisory committee members, and coursework. Throughout the student's graduate program, the major professor

## *CHAPTER 4. REQUIREMENTS FOR ALL DEGREES*

has the responsibility to ensure that the student continues to make satisfactory progress toward completion of the degree.

The strengths and weaknesses of the student should be assessed early in the program. Perceived problem areas should be addressed directly. The student must be proficient in basic sciences, engineering sciences, and mathematics to be successful in a graduate program in engineering. Additionally, students must also have developed oral and written communication skills in order to contribute effectively in their careers. The major professor should provide as many opportunities as possible for the student to improve his/her oral presentation skills by arranged and impromptu presentations and opportunities to lecture in classes where appropriate. PhD students should also be encouraged to give presentations of research papers at professional meetings.

Research is a key component; particularly to the PhD student's program. The major professor should encourage the student to practice creatively the three "I's" of research: Initiative, Ingenuity, and Imagination. The research project is the aspect in which the individual can perhaps best exercise his/her independence as well as ability to work and communicate in a group setting. The student should be aware of the total program of the major professor and how his/her part of the research fits into that program. This will require frequent meetings with the full research team and cooperators to communicate current status and goals of the program. Thus, it is important that the major professor keep the student informed of his/her work and current goals.

It is fully expected and encouraged that the student both: a) work on aspects of the major professor's research program that may not be related directly in the student's thesis/dissertation; and b) incorporate other aspects of the major professor's work into his/her thesis/dissertation. The major professor may ask the student to collect data with or for him/her or another student on a related topic that is not necessarily to be reported in the dissertation. Likewise, the major professor or another student may have data which the student may be able to use directly without compromising the data for other use. The student should also be made aware of other research of the BAE Department.

The major professor must actively seek ways to challenge the student to work under his/her own initiative. Choice of a research topic and the undertaking of the research require a judicious balance between over-direction and under-direction by the major professor. Some students may initially need more direction than others, but the ultimate goal is for the student to develop abilities for independent research. To do so obviously requires adequate education and training in engineering and science, but it also requires self-motivation and confidence.

Thus, the specific responsibilities of the major professor are:

- To ensure that the student has a rigorous program of academic coursework and research which meets departmental criteria and provides the student with an education at the highest possible level of excellence
- To assist in the selection of a course of study
- To actively involve the Advisory Committee, who, like the major professor, provides expertise, examines and evaluates plans of study with regard to their respective areas of expertise
- To oversee completion of all BAE and Graduate School requirements, including submission of all required forms, on a timely basis
- To provide guidance to the student so that he/she can become an effective leader through his/her engineering and scientific contributions

## CHAPTER 4. REQUIREMENTS FOR ALL DEGREES

- To ensure that the student successfully completes the graduate program, or alternately, to identify at an early stage that it is not in the student's best interest to continue in the program.

### 4.6 Teaching Requirements

All students should attend the Graduate School orientation for teaching assistantships in the fall. Details may be obtained from the Student Affairs Professional I in Room 120. All students are advised to receive some teaching experience. The department endeavors to provide some teaching experience for all students. Teaching experience may include one or more of the following:

- Assisting in classroom teaching (lectures, grading, etc.)
- Assisting in laboratory exercises
- Providing tutoring when arranged by the department
- Accessing and preparing materials for lectures or lab
- Being responsible to teach part of a course or an entire course
- Preparing and providing continuing education short courses, workshops, etc.

As much as possible, teaching assignments should include student contact and be diverse for a positive learning experience.

For teacher training and support, please go to: [http://www.ctl.uga.edu/teach\\_asst/teach\\_asst.htm](http://www.ctl.uga.edu/teach_asst/teach_asst.htm)

### 4.7 Policy on Academic Honesty

The University of Georgia Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." All students in the BAE Graduate Program are expected to adhere to the university's policy on academic honesty. To review the policy, go to: <http://www.uga.edu/ovpi/honesty/ah.pdf>

### 4.8 Policy on Responsible Conduct in Research and Scholarship

As a companion to the university's policy on academic honesty, it is expected that BAE Graduate Program students adhere to the university's policy on responsible conduct in research and scholarship. To review the policy, go to: <http://www.ovpr.uga.edu/rinteg/#1>

### 4.9 Academic Probation and Dismissal

A student is placed on academic probation when his/her cumulative graduate grade point average falls below 3.0 and remains on probation as long as the cumulative average is below 3.0. Proficiency (Make-up) Courses will not be counted towards maintaining the minimum cumulative graduate grade point of 3.0. The student must make a minimum 3.0 graduate grade point average on at least 9 hours in each of the succeeding semesters while on academic probation. If the student makes below a 3.0 grade point average during probation, he/she will be dismissed. If a student repeats a course, the last grade received will be used in the calculation of grade point average for the purposes of determining academic probation or dismissal decisions.

## *CHAPTER 4. REQUIREMENTS FOR ALL DEGREES*

An incomplete (I) grade must be removed before the completion of 2 semesters. Otherwise, under the Graduate School policy, the grade is automatically changed to a grade of Fail (F) by the Registrar.

Whenever a student is placed on academic probation, the student, the Major Professor, the Graduate Coordinator and Department Head shall collectively discuss factors related to the low GPA and if the student has an assistantship, they will also evaluate the assistantship assignment. If the student remains on academic probation for two consecutive semesters, his/her assistantship will be discontinued.

Graduate students may appeal an academic dismissal to the Graduate School Dean. For information, go to:

<http://www.uga.edu/gradschool/academics/regulations.html#ProbationDismissal>

### **4.10 Application for Graduation**

The Application for Graduation must be submitted online to the Graduate School two semesters prior to your anticipated graduation date. The form and further instruction can be found at the Graduate School's Forms and Publications for Current Students website located at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

# Chapter 5

## Requirements for the PhD Degree

### 5.1 Overview

The PhD course of study unifies the diverse knowledge bases of the biological, agricultural, physical, social, and engineering sciences to enable the student to lead in the discovery of engineering solutions critical to the development of complex biological and agricultural systems.

### 5.2 Required Coursework

The Graduate school requires that the Graduate Plan of Study contain 16 hours of coursework at the 8000/9000 level, exclusive of research/dissertation hours, in addition to other work completed for prior degrees. Typically, 51-54 semester hours beyond the bachelor's degree in engineering is expected, including mathematics and statistics (approximately 12 hours), engineering science core (approximately 9 hours), and courses in the area of emphasis (30 hours). Students not having a BS in an engineering discipline may be required to complete additional requirements specified by the Graduate Coordinator.

BAE places high value on advanced proficiency in mathematics, statistics, student's selected area of science, and knowledge of research methods. To achieve this proficiency, the following requirements must be met.

Required:

The department requires the following courses (or their equivalent approved by the Graduate Coordinator) to provide fundamental knowledge for conducting original engineering research.

ENGR 6910 Research Methods (2 hrs)

ENGR 6101, 8102, 8103 Computational Methods is a module course (3 hrs)

ENGR 8950 Graduate Seminar (1 hr. each year, up to a maximum of 3 hrs)

ENGR 9000/9300 Doctoral Research/Dissertation (at least 6 hrs)

Course(s) should be included to provide students with knowledge of sensors and instrumentation for engineering research.

Recommended:

Courses in advanced mathematical and statistical methods (15 hrs)

Courses in student's selected area in science (9 hrs)

## CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE

The student, in consultation with the Advisory Committee, selects courses which contribute to the development of an in-depth knowledge. The selection of courses should be guided to have the student acquire the following:

- Competency in the selected area of science
- Ability to integrate diverse knowledge
- Creative thinking ability for defining problems
- Ability to conduct original research

### 5.3 PhD Advisory Committee Appointment

The Graduate Coordinator must appoint an Advisory Committee by the middle of the second semester. A student's Advisory Committee will be composed of the major professor and at least three other members approved by the Graduate School. At least two of the three additional members must be full or provisional members of the Graduate Faculty. The Graduate School will allow one member to be non-faculty; however, this person must submit a vita to the Dean of the Graduate School showing evidence of a terminal degree in an appropriate field of study. The major professor and at least two other members, or a majority of members, will be from the faculty of the Department of Biological and Agricultural Engineering. Other members of the committee may be from cooperating departments and/or colleges of the University.

The major professor of the student will be the chair of the Advisory Committee. Based on the student's program of study, a co-major professor may be identified. The major professor will keep the Advisory Committee fully involved in the student's program of study. The committee's recommendations will be forwarded only when at least four-fifths of the members approve the recommendation.

The Advisory Committee is responsible for advising, examining and approving all facets of the student's progress. The major professor, in consultation with the Advisory Committee, should carefully evaluate the student at the end of the first year in order to advise the student whether or not to continue in the program and provide a written recommendation to the Graduate Coordinator. (See [Evaluation of Student's Preparedness](#))

To receive approval from the Graduate School, the Advisory Committee for Doctoral Candidates Form must be completed and submitted by the Graduate School deadline found at:

<http://www.uga.edu/gradschool/academics/deadlines.html>

The student and major professor are expected to fill out the form, obtain required signatures, and submit to the Graduate Coordinator. The Advisory Committee for Doctoral Candidates Form is available at: [http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

In case there is a need to change the composition of the Advisory Committee, the form must be completed again. Before doing so, the student should consult with the Major Professor and the Graduate Coordinator.

## CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE

### 5.4 Program of Study

#### 5.4.1 Preliminary Program of Study

The preliminary program of study must be comprised of a list of courses selected on the basis of constituting a logical whole in the area of interest and must include make-up courses, if any are required (see [Appendix C](#)). This form is to be completed by the student and approved by the Advisory Committee and submitted to the Graduate Coordinator before the end of the second semester of graduate study. This is a preliminary program and is retained in the department only. This program of study can be modified at the discretion of the Advisory Committee and the approval of the Graduate Coordinator. If the preliminary program of study is modified, the changes should be forwarded to the Graduate Coordinator for the student's departmental file. The Preliminary Doctoral Program of Study Form is available at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

#### 5.4.2 Final Program of Study

The Final Doctoral Program of Study Form must be submitted prior to admission to candidacy and by the Graduate School deadline. See: <http://www.uga.edu/gradschool/academics/deadlines.html>

The final program of study must include all changes made since the approval of the preliminary program and will generally include 27 hours of course work beyond the MS level including a minimum of 3 hours of ENGR 9300.

Undergraduate [Proficiency \(Make-up\) Courses](#) taken either to fulfill research skills requirements or to remove deficiencies may not be calculated in the 30 consecutive hours of resident credit. Failure to enroll during summer semester is not considered an interruption for residency requirements.

The final program of study must show all graduate courses (including courses from the Master's degree) and all make-up courses relevant to the doctoral program; not just courses satisfying the minimum degree requirement. This program of study must be submitted on the proper form for approval by the Advisory Committee, the Graduate Coordinator and the Dean of the Graduate School.

The Final Doctoral Program of Study Form is available at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

### 5.5 Evaluation of Student's Preparedness

The Advisory Committee must meet before the end of the first year in residence to carefully evaluate the student's preparedness for the PhD program. This evaluation may be conducted by an interview to determine the student's progress in the program. The committee must judge whether or not the student is prepared to the extent that he/she will be able to successfully complete required courses, develop a comprehensive understanding of knowledge in the subject area, develop an understanding of research methods, and complete the dissertation research. The Advisory Committee must inform the Graduate School of its evaluation in writing. In case the student is not prepared for the PhD program, he/she may be allowed to complete an MS degree.

## *CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE*

### **5.6 Comprehensive Examination**

The purpose of the comprehensive examination is to evaluate whether or not the student has developed proficiency in unifying the diverse knowledge bases of the biological, agricultural, physical, and engineering sciences in the engineering analysis and problem solving within the domain of biological and agricultural systems. To successfully complete this examination, the student must demonstrate that he/she has acquired fundamental knowledge to the extent whereby he/she can effectively comprehend new scientific discoveries and interact with scientists, and has developed abilities in the discovery of engineering based solutions. The examination consists of both a 2-part written exam and an oral exam.

Copies of the written comprehensive examination and scores of the student will be kept on file by the Graduate Coordinator. All Graduate School regulations and requirements for the comprehensive examination for PhD candidates must be met. The Major Professor and the Graduate Coordinator must complete appropriate forms for admission to candidacy immediately after the successful completion of both written and oral examinations by the student.

#### **5.6.1 Eligibility**

Each BAE PhD student, starting with the fall 2007 class, will be required to take the first part of the written exam by the end of their third semester of study as long as they have maintained the minimum 3.0 GPA. Students entering with deficiencies may petition the Graduate Advisory Committee to defer a semester if the need for additional coursework is justified. Summer terms do not count as academic semesters of residency. A student will be allowed to take the oral examination only after successful completion of the written examination.

#### **5.6.2 The Written Exam**

The written exam is divided into two parts; the first part being a general exam (hereafter referred to as the Qualifying Exam), focusing on advanced engineering science. The second part being a written exam, focusing deeper into the student areas of study (hereafter referred to as the Comprehensive Written Exam) and administered by the student's Major Professor.

##### **5.6.2.1 The Qualifying Examination**

The philosophy behind the Qualifying Exam is one of integration. The exam was developed to both strengthen students' research, teaching, outreach, fund raising, and team building skills, as well as to develop students who are well-rounded in advanced engineering sciences. The overall intent of the exam is to assist students to be life-long learners; to teach similar courses when they become professors themselves and to adapt as the nature of their work changes.

The Qualifying Exam will be composed of two three-hour sessions; it will be administered by the Graduate Advisory Committee, and offered two times a year (January and June). The questions for the Qualifying Exam will be assembled from a pool of questions from faculty. The Graduate Advisory Committee will set the grade and make one of the following recommendations to the Graduate Coordinator for approval: 1) Pass; 2) Pass with required conditions; or 3) Fail.

## *CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE*

Conditions in (2) will be based on the committee's interpretation of the student's exam performance relative to the Qualifying Exam philosophy.

A student may retake the exam only once. At the time of the exam retake, the student must meet the G.P.A. requirement and otherwise be in good academic standing. A retake will automatically be set for the next exam schedule.

### **5.6.2.2 Appeals Process**

In the case of a second exam failure, the student's case will be automatically considered within 30-days by the BAE Appeals Committee. The Appeals Committee will be appointed by the BAE Department Head to serve a two year term. The Appeals Committee will solicit comments from the student's research advisor, and other faculty members selected at his discretion. Other members of the BAE Graduate Faculty may provide input to the Appeals Committee for consideration during the appeal deliberations. A vote of the Appeals Committee will be taken by secret ballot and tallied by the Appeals Committee Chair or his/her designate. A simple majority will be required for a student to remain in the program as a PhD student. There is only one opportunity for appeal.

Students will be notified of final outcome after the appeals meeting. Students will not be told the results of exam vote, but only the outcome of the entire process of exam appeal (i.e., the student remains a PhD student or becomes an MS student and must exit the program after satisfying MS degree requirements). The Graduate Advisory Committee will notify the student and the student's Major Professor in writing of the exam outcome and any additional requirements.

### **5.6.2.3 The Comprehensive Written Exam**

This policy is still under development and will be added when complete.

### **5.6.3 The Oral Exam**

The oral examination can be taken only after passing the written examination. The oral examination is administered by the Advisory Committee with the Major Professor as chairman. The Major Professor of the student, in consultation with the student, the advisory committee, and the Graduate Coordinator, will select the time and location of the oral examination within one month after the completion of the written examination. The Major Professor will notify the Graduate School through the Graduate Coordinator. All faculty of the Department of Biological and Agricultural Engineering and of other departments that encompass the student's program will be invited. The student must receive a passing grade on the exam from at least four-fifths of the Advisory Committee. The oral examination and thesis proposal may be scheduled on the same day but must be scheduled at separate times.

## *CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE*

### **5.7 Dissertation Research Proposal**

Students pursuing the PhD program in Biological and Agricultural Engineering must complete a dissertation on a subject within their major field of study. The dissertation must document originality in research, independent thinking, scholarly ability, and technical mastery of the field of study. It must add fundamental knowledge or improved interpretation of facts already known within the field. Its conclusions must be derived from logic, its literary form acceptable, and its value worthy of publication within a major refereed journal in the field of study.

The student shall prepare a formal dissertation research proposal for written and oral presentation to the student's Advisory Committee before the end of the fourth semester in residence (sixth semester for a student who enters the PhD program with only a BS degree). Following an abstract, the proposal should clearly include a statement of the problem, work to be undertaken, objectives and its significance, relation to similar previous or current research, outline of the plan of work delineating anticipated theoretical and experimental procedures, and bibliography. Following oral presentation by the student, the Advisory Committee will conduct an evaluation to determine the suitability of the proposed research topic as well as the student's depth and breadth of knowledge required for accomplishing the dissertation study. This oral query on the research proposal does not substitute for the comprehensive oral examination.

Approval of the dissertation research proposal requires agreement of at least four-fifths of the members of the Advisory Committee as evidenced by their signing the Approval Form for Doctoral Dissertation and Final Oral Examination which, together with the approved written proposal, will be filed with the Graduate Coordinator.

The Approval Form for Doctoral Dissertation and Final Oral Examination is available at:  
[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

### **5.8 Admission to Candidacy**

Admission to PhD candidacy is required at least two semesters prior to graduation. Prior to admission to candidacy, the final program of study and the comprehensive written and oral exams must be successfully completed. If some requirements have not been met, filing the admission to candidacy forms may be deferred until such time as the deficiency is satisfied.

The application form is typically submitted by the Major Professor to the Graduate Coordinator immediately after the administration of the comprehensive exam. The form is then forwarded to the Graduate School. Usually, the admission to candidacy form is filed along with the report of the results of the written and oral comprehensive examinations.

Please be aware that a student must be admitted to candidacy within six years of enrolling in Graduate School and must complete requirements for the degree within five years of being admitted to candidacy.

## *CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE*

### **5.9 Dissertation and Final (Oral) Examination**

The dissertation should be prepared under the direction of the Major Professor according to the guidelines of the Graduate School. This may be in the traditional format or involve a series of articles in the acceptable technical publication format included as chapters. The use of articles, prepared in accordance with the guidelines to authors, for an appropriate journal is encouraged. Dissertations with journal articles should also include an introduction, comprehensive review of the literature, statement of a hypothesis, list of research objectives, and conclusions or dissertation summary. If the traditional dissertation format is selected, then at least one article for publication should also be prepared and reviewed simultaneously with the dissertation review. The format of the dissertation should be discussed with both the Major Professor and Advisory Committee early during the research.

Graduate School Dissertation Guidelines are available at:

<http://www.uga.edu/gradschool/academics/thesis.html>

#### **5.9.1 Preparation and Review of the Dissertation**

The Major Professor should be regularly consulted during all phases of the dissertation preparation. When the dissertation meets the approval of the Major Professor, he/she will certify this approval and distribute copies to the Advisory Committee, schedule the final oral defense, and notify the Graduate School through the Graduate Coordinator. The committee members will have three weeks to read and evaluate the completed dissertation.

The Graduate School will announce the time and place of the oral defense of the dissertation. Written approval by at least four-fifths of the Advisory Committee is required before the dissertation is approved as ready for final defense. If the Advisory Committee declines to approve the content of the dissertation for final defense, the Major Professor will notify the student and the Graduate School.

For submission deadlines for the format check and the Final Defense Approval Form, go to:

<http://www.uga.edu/gradschool/academics/deadlines.html>

#### **5.9.2 Approval Form for Doctoral Dissertation and Final Examination**

Part I of this form will be completed by the Major Professor when he/she feels that the dissertation is suitable for reading by the Advisory Committee. Part II of the form requires the signatures and actions of the Advisory Committee for the dissertation. If at least four of the five committee members "approve" or "approve with suggested changes" the dissertation, the Major Professor will complete Part III of the form after all required changes have been made. The oral defense can then be scheduled. The student must be registered for at least three (3) hours in the semester the oral defense is scheduled. Part IV of the form will be completed after the oral defense.

The Final Defense Approval Form is available at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

## *CHAPTER 5. REQUIREMENTS FOR THE PHD DEGREE*

### **5.9.3 Announcement and Seminar**

It is highly recommended that the candidate arrange to present a seminar on the dissertation research one to three weeks prior to the oral examination. The candidate should invite interested members of the academic community.

### **5.9.4 Final (Oral) Examination**

The oral defense of the dissertation research will be the final examination. The oral examination will be chaired by the candidate's Major Professor. In addition to the candidate's Advisory Committee, other faculty are welcome to participate in the final examination. For the candidate to successfully pass this examination, four-fifths of the Advisory Committee must approve the dissertation with "no changes" or with "suggested changes," and pass the candidate in the oral defense. In case the candidate fails the examination or his/her dissertation is disapproved, the Advisory Committee must provide written recommendations including the time within which appropriate improvements must be made. The Advisory Committee must also target a date by which a second and final oral examination must be taken.

Upon the successful completion of the final examination, the Major Professor, in consultation with the Graduate Coordinator, must complete all appropriate forms and submit them to the Graduate School without delay but no later than at least one week prior to the graduation date. The final draft of the dissertation must be submitted to the Graduate School for approval no later than the last day of classes of the semester following the final examination. If this deadline is missed, the dissertation must be defended again and pre-approved by the Advisory Committee.

## Chapter 6

# Requirements for the MS Degree

### 6.1 Overview

The Biological and Agricultural Engineering Department (BAE) offers research-based master's degrees inspired by applications in agricultural, biological and environmental systems. The MS Program provides an opportunity for learning skills in advanced data analyses, original research presentation and problem definition.

### 6.2 Required Coursework

A student must complete at least 24 semester hours of graduate credit, excluding thesis. At least 12 semester hours must be UGA courses open only to graduate students. The 12 hours may not be satisfied by transfer credit, master's research (7000), thesis writing (7300), or independent study courses. The Department places high value on advanced proficiency in mathematics, the student's selected area of engineering and science, and knowledge of research methods. To achieve this proficiency, the following requirements must be met.

The Department requires the following courses (or their equivalent) approved by the Graduate Coordinator to provide skills for engineering research.

ENGR 6910 Research Methods (2 hrs)

ENGR 8950 Graduate Seminar (1 hr)

ENGR 6101, 8102, 8103 Computational Methods is a module course (3 hrs)

Course(s) should be included to provide students with knowledge of instrumentation for engineering research, advanced mathematics, statistical methods and computers. Students with non-engineering BS degrees are highly encouraged to take ENGR 6920 Engineering Design.

The courses in the program of study are selected by the student in consultation with his/her Major Professor and the Advisory Committee and approved by the Graduate Coordinator. Generally, the courses selected should have the student acquire the following:

- Understanding in the selected area of study
- Ability to synthesize knowledge
- Rational problem solving skills
- Confidence in conducting independent work.

The MS in Biological Engineering expects that students will have 9 hours of life science. Some suggested courses are shown in [Appendix C](#).

## *CHAPTER 6. REQUIREMENTS FOR THE MS DEGREE*

### **6.3 Masters Advisory Committee Appointment**

The purpose of the Advisory Committee is to advise, review, examine and recommend actions on all aspects of the student's graduate studies. Thus, the Advisory Committee is charged to work with the student in the development of the program of study and thesis research proposal, and to review and examine the student's performance in developing an understanding of the selected courses and thesis research. Actions of the major professor and the Advisory Committee are required on all recommendations before the Graduate Coordinator can forward his/her recommendation to the Graduate School.

The student and the Major Professor should identify faculty members who may serve on the committee and discuss with the Graduate Coordinator before contacting potential members of the committee. The major professor must agree with the selection of committee members before the request is presented to the Graduate Coordinator for approval. In many cases, the student and the Major Professor may recommend more than two additional members. These additional members can be voting or non-voting members which permits the flexibility of selecting competent individuals from other colleges, universities and industries who may not be members of UGA Graduate Faculty. The majority of the committee members will be from the BAE faculty.

The Advisory Committee must be approved by the middle of the second semester of graduate study and the Advisory Committee for Master of Arts and Master of Science Candidates Form must be completed and submitted by the Graduate School deadline found at:

<http://www.uga.edu/gradschool/academics/deadlines.html>

The student and Major Professor are expected to fill out the form, obtain required signatures, and submit to the Graduate Coordinator. The Advisory Committee for Master of Arts and Master of Science Candidates Form is available at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

### **6.4 Masters Program of Study**

The program of study must be prepared and approved by the middle of the second semester in residence. A program of study is the list of courses identified in consultation with the Advisory Committee. This action leads to good selection of courses for acquiring knowledge in the selected area of study. The committee's recommendation should be forwarded to the Graduate Coordinator for his/her approval. The Graduate Coordinator will forward his/her recommendation for the Graduate School Dean's approval.

The program of study may be amended with the approval of the Advisory Committee and the Graduate Coordinator. In this case, submit the Recommended Change in Program of Study Form for the approval of the Graduate School Dean. Please note that the thesis credit hours cannot be counted toward the 24 hours of graduate course credit requirement. Also, at least 12 semester hours in UGA must be earned from courses restricted to graduate students only. Sample programs of study are available in [Appendix D](#).

For the Graduate School submission deadline, go to:

<http://www.uga.edu/gradschool/academics/deadlines.html>

## *CHAPTER 6. REQUIREMENTS FOR THE MS DEGREE*

The above mentioned forms are available at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

### **6.5 Thesis**

Students are encouraged to make regular progress toward completing their thesis research. Consulting regularly with your Major Professor and Advisory Committee and writing parts of the thesis while actively conducting research is highly recommended.

The format of the thesis and other requirements are explained in the guidelines available from the Graduate School at: <http://www.uga.edu/gradschool/academics/thesis.html>

The Graduate School places deadlines for submission of your thesis! Go to:

<http://www.uga.edu/gradschool/academics/deadlines.html>

#### **6.5.1 Research Proposal**

A written proposal and an oral presentation of the proposed thesis research to the Advisory Committee are required by the BAE Department.

In general, a thesis proposal will include a summary, an introduction which states the problem, previous and current research, work to be undertaken, objectives and its significance, analysis of the problem, hypothesis, outlined plan of work, anticipated theoretical and experimental work, bibliography and resource needs.

The Graduate Coordinator in consultation with the major professor schedules the oral presentation of the thesis proposal. The Graduate Coordinator may be present with the Advisory Committee for the oral presentation.

Following approval by the Advisory Committee, the Major Professor immediately completes the Thesis Research Proposal Form and submits it to the Graduate Coordinator for final approval. The thesis research proposal must be approved before research is undertaken.

The student is expected to have an approved proposal by the end of the second semester. Whenever this deadline is missed, the student and the major professor may be asked to provide a written progress report to the Graduate Coordinator. Failing to have an approved thesis proposal by the end of the third semester will reflect unsatisfactory progress requiring special attention.

#### **6.5.2 Review**

The student should provide adequate time for the members of the Advisory Committee to review the thesis research and thesis draft. Generally, the student's Major Professor approves the quality of the thesis draft before one copy each is provided to the Advisory Committee members and the Graduate Coordinator. The student should distribute the draft copies at least two weeks before the scheduled final examination. The final examination will be postponed when the majority of the Committee does not approve the written thesis draft.

## *CHAPTER 6. REQUIREMENTS FOR THE MS DEGREE*

### **6.5.3 Journal Article**

The quality of thesis is judged by evaluating whether the research is publishable in a reputable refereed journal. The student should prepare at least one manuscript for a refereed journal following the publication guidelines. The manuscript should be in the final form requiring only minor editing. The Major Professor may not agree to schedule a meeting of the Advisory Committee for the purpose of conducting final examination without a satisfactory draft of the manuscript.

### **6.5.4 Final Examination and Oral Defense**

The purpose of the final examination and oral defense is to evaluate whether the following criteria have been met:

- A. The student has gained knowledge in the selected area of study through course work which has significantly increased his/her ability in engineering analysis and rational problem solving.
- B. The student's understanding of research process is at a level where he/she can independently approach problem definitions and solutions.
- C. The thesis research work is of a quality which will likely be approved by peers for publication in a reputable refereed journal.

Part I, the final exam, tests for criteria A. The format is either written and oral, or oral only.

Part II, the oral defense, is an evaluation of criteria B and C. The format is oral only.

Generally, both Part I and Part II will be oral during a single meeting of the Advisory Committee; however, either the student or the committee may choose to conduct the two-part examination separately in both written and oral formats.

It is required that the Graduate Coordinator be present for the Oral Defense and any oral portion of the final exam. The Advisory Committee conducts these examinations and recommends action by a majority vote. Students and faculty of the Department are invited to attend the portion of the examination dealing with the presentation of the thesis research.

### **6.5.5 Approval Form for Master's Thesis and Final Examination**

The Approval Form for Master's Thesis, Defense, and Final Examination Master of Arts and Master of Science Candidates must be submitted to the Graduate School. Part I of this form will be completed by the Major Professor when he/she feels that the thesis is suitable for reading by the Advisory Committee. Part II of the form requires the signatures and actions of the Advisory Committee for the thesis. The Major Professor will complete Part III of the form after all required changes have been made. The oral defense can then be scheduled. The student must be registered for at least three (3) hours in the semester the oral defense is scheduled. Part IV of the form will be completed after the oral defense.

The form is available at:

[http://www.uga.edu/gradschool/forms&publications/currentstudent\\_forms.html](http://www.uga.edu/gradschool/forms&publications/currentstudent_forms.html)

## **Appendix A**

### **Faculty Membership Information**

A listing of BAE faculty and their area(s) of specialty is located at:

[http://www.engr.uga.edu/directory/people.php?user\\_type\\_id=1](http://www.engr.uga.edu/directory/people.php?user_type_id=1)

Members of the Faculty of Engineering (FE) and their areas of specialty can be found at:

[http://www.engineering.uga.edu/foe/faculty/list\\_name.php](http://www.engineering.uga.edu/foe/faculty/list_name.php)

## **Appendix B**

### **Facilities**

Extensive teaching and engineering research facilities are located on the three campuses of the University of Georgia, College of Agriculture at Athens, Griffin, and Tifton. Information about facilities at each of the UGA campuses is available at:

<http://www.engr.uga.edu/facilities.html>

## Appendix C

### List of Supplementary Courses

A student with a non-engineering degree is expected to take adequate coursework in engineering to enable him/her to pass the Fundamentals of Engineering Exam. To accomplish this, the student will be required to take (or demonstrate proficiency in) 28 semester hours of coursework selected from undergraduate engineering courses. The selection of the appropriate courses will be made by the student, the major professor and the Advisory Committee and approved by the Graduate Coordinator. The following list of courses is not exhaustive.

- ENGR 2120 3 hrs. Statics\*
- ENGR 2130 3 hrs. Dynamics
- ENGR 2140 3 hrs. Strength of Materials
- ENGR 2150 3 hrs. Fluid Mechanics
- ENGR 3150 3 hrs. Heat Transfer\*
- ENGR 3140 2 hrs. Thermodynamics
- ENGR 2170 3 hrs. Electric Circuits
- ENGR 4240 3 hrs. Introduction to Microprocessors
- ENGR 3120 3 hrs. Spatial Data Analysis
- ENGR 3270 3 hrs. Engineering Electronics I
- ENGR 3300 3 hrs. Mechanisms and Machine Kinematics
- ENGR 3410 3 hrs. Intro to Natural Resource Engineering
- ENGR 3540 3 hrs. Physical Units Operation
- ENGR 3610 3 hrs. Structural Design
- ENGR 4650 3 hrs. Control of Structural Environments I

The above list of courses requires that Calculus I, II, III and Differential Equations be completed prior to enrolling in these courses. Courses marked with an asterisk (\*) are usually offered in the summer term.

A student with an engineering degree, whose program of study has emphasis in biological engineering, is expected to take adequate coursework in biological sciences to provide him/her a fundamental understanding of biological materials and biological systems. To accomplish this, the student will be required to take (or demonstrate proficiency in) 11-12 semester hours of coursework selected from the following list of courses. The selection of the appropriate courses will be made by the student, the major professor and the Advisory Committee and approved by the Graduate Coordinator.

- BIOL 1107-1107L 4 hrs Principles of Biology I
- BIOL 1108-1108L 4 hrs Principles of Biology II
- BCMB/BIOL 3100 3 hrs Intro. Biochem. and Molec. Biology
- BIOL/GENE 3204 3 hrs Genetics
- MIBO 3500 3 hrs Introductory Microbiology
- MIBO 3510L 2 hrs Introductory Microbiology Laboratory

## APPENDIX C. LIST OF SUPPLEMENTARY COURSES

In addition to the 11-12 semester hours of foundation coursework from the above list, additional biological science courses may be needed to develop proficiency in a selected area. The following is a list of "recommended" courses. Note that graduate credit may be granted for 6000-level courses. For course description information, please visit the [UGA Bulletin](#).

<u>Biochemistry</u>		<u>Credit Hours</u>
BCMB 4010/6010	Biochemistry & Molecular Biology	3
BCMB 4030/6030	Lab. Techniques in Biochem. & Molecular Biol.	3
BCMB 8010	Advanced Biochemistry & Molecular Biology	4
BCMB 8020	Advanced Biochemistry & Molecular Biology	4
<u>Botany</u>		
BIOL/BTNY 1210-1210L	Elementary Botany	4
BTNY 3830-3830L	Elementary Plant Physiology	4
BTNY 6230-6230L	Plant Anatomy	4
BTNY 6500	Introduction to Gene Technology	3
BTNY 6830	Plant Physiology	3
<u>Chemistry</u>		
CHEM/BCMB 6190	Introduction to NMR Spectroscopy	3
CHEM/BCMB 8189	Fundamental Principles of NMR Spectroscopy	3
CHEM 8220	Physical Methods in Inorganic and Bioinorganic Chem.	4
CHEM 8310	Reaction Mechanisms in Organic Chemistry	3
CHEM 8820	Electrochemistry	3
CHEM 8830	Electronics	4
CHEM 8840	Surface and Thin Film Analysis	3
CHEM 8920	Thermodynamics and Statistical Mechanics	3
CHEM 8940	Chemical Kinetics and Dynamics	3
<u>Entomology</u>		
ENTO 3650-3650L	Medical Entomology	3
ENTO 3740-3740L	Agricultural Entomology	3
ENTO 3820-3820L	Forest Entomology	2
ENTO 6000-6000L	Advanced General Entomology	3
<u>Genetics</u>		
BIOL/GENE 3200	Genetics	3
BIOL/GENE 3210	Experimental Genetics	3
BIOL/GENE 6200	Advanced Genetics	3
<u>Microbiology</u>		
MIBO 6090	Prokaryotic Biology	3
CBIO/MIBO 6100	Immunology	3
MIBO 6600L	Advanced Laboratory Methods in Microbiology	3

## APPENDIX C. LIST OF SUPPLEMENTARY COURSES

<u>General Biology (Courses additional to those listed above)</u>		<u>Credit Hours</u>
BIOL/ECOL 3500-3500L	Ecology	4
BIOL/ECOL 3510	Ecology Laboratory	3-4
BIOL/VPAT 5040L/7040L	Theory of Electron Microscopy	3
BIOL/VPAT 5050L/7050L	Electron Microscopy Laboratory	3
 <u>Veterinary Sciences</u>		
VPHY 6050	Animal Physiological Chemistry	2
VPHY 6090	Comparative Mammalian Physiology	3
VPHY 6100	Comparative Mammalian Physiology	3
PHRM/VPHY 6910	Introductory Toxicology	3
PHRM/VPHY 6930-6930L	Methods in Toxicology (analytical methods course)	1-3
PHRM/VPHY 8000	Cardiovascular Physiology	2
VPHY 8080	Ruminant Physiology	3
VPHY 8120	Renal and Fluid-Electrolyte Physiology	2
VPHY 8200	Animal Mol. Biology: Concepts & Current Lit.	2
VPHY 8400	Neurophysiology	2
VPHY 8460	Molecular Pharmacology	3
PHRM/VPHY 8910	Organ Systems Toxicology I	3
PHRM/VPHY 8920	Organ Systems Toxicology II	3
PHRM/VPHY 8930	Toxicology of Ag. & Ind. Chemicals Environment	3
 <u>Ecology and related graduate courses</u>		
ECOL 6020/L	Field Systems Ecology	3
ECOL 6000	Population and Community Ecology	3
FORS 8360	Quantitative Approaches to Conservation Biology	4
GEOG 6220	Ecological Biogeography	3
ECOL 4010/6010	Ecosystem Ecology	3
ECOL 8580	Theory of Systems Ecology	4
GEOG 6810	Conservation Ecol. & Resource Mgmt.	3
 <u>Pharmacy</u>		
PHRM 6400	Human Physiology I	4
PHRM 6500	Human Physiology II	4
PHRM 7210	Special Topics: Neurophysiology/ Neuropharmacology of Synapse	3-5
PHRM 7260	Clinical Pharmacokinetics	3
PHRM 8260	Pharmacokinetics I	4
PHRM 8420	Cardiovascular Pharmacology	3
PHRM 8430	Advanced Neuropharmacology	3

Please keep in mind that some of the above courses have required prerequisites.

## Appendix D

### Sample Programs of Study

#### MS in Agricultural Engineering

##### Example Program of Study

##### Required Courses: (3 hrs)

ENGR 6910 Research Methods	2
ENGR 8950 Graduate Seminar	1
ENGR 6101, 8102, 8103 Computational Methods Modules	3

##### Engineering Courses (12 hrs)

ENGR 6580 Bioconversion Engineering	3
ENGR 8980 Advanced Topics in Biological Engineering - Fish Pond Design in Developing Countries (Honduras)	3
ENGR 8990 Advanced Topics in Agricultural Engineering - Composting	3
ENGR 8990 Advanced Topics in Agricultural Engineering - Physical Properties of Agricultural Materials	3

##### Other Courses (9 hrs)

STAT 6210 Statistical Methods I	3
STAT 6220 Statistical Methods II	3
EETH 8990 Environmental Dispute Resolution	<u>2</u>
	<b>26 hrs</b>

## APPENDIX D. SAMPLE PROGRAMS OF STUDY

### MS in Biological Engineering

#### Example Program of Study 1

##### Required Courses: (3 hrs)

ENGR 6910 Research Methods	2
ENGR 8950 Graduate Seminar	1
ENGR 6101, 8102, 8103 Computational Methods Modules	3

##### Biological Science Courses (9 hrs)

MIBO 6090 Prokaryotic Biology	3
BCMB 6000 General Biochemistry and Molecular Biology	3
BTNY 6830 Plant Physiology	3

##### Other Courses (18 hrs)

STAT 6510 Mathematical Statistics I	3
MATH 6500 Numerical Analysis I	3
MATH 6510 Numerical Analysis II	3
ENGR 6510 Eng. And Design of Biochemical Proc. I	3
ENGR 6230 Sensors & Transducers	3
MIBO 6610-610L Soil Microbiology	3
	<u>3</u>
	<b>33 hrs</b>

### MS in Biological Engineering

#### Example Program of Study 2

##### Required Courses: (3 hrs)

ENGR 6950 Research Methods	2
ENGR 8950 Graduate Seminar	1
ENGR 6101, 8102, 8103 Computational Methods Modules	3

##### Biological Science Courses: (8 hrs)

BCMB 6000 General Biochemistry & Molec. Biol.	3
MIBO 6090 Prokaryotic Biology	3
BTNY 8140 Algal Ecology	2

##### Other Courses: (18 hours)

STAT 6510 Mathematical Statistics I	3
ENGR 6510 Engr. And Design of Biochemical Proc. I	3
ENGR 6520 Engr. And Design of Biochemical Proc. II	3
ENGR 6110 Momentum and Heat Transport Processes	3
ENGR 6920 Engineering Design	3
ENGR 6230 Sensors & Transducers	3
	<u>3</u>
	<b>32 hrs</b>

# **Appendix E**

## **Sample PhD Qualifying Exam Questions**

**Under development**

## Appendix F

### Other Resources

The following resources may be useful to Graduate Students. For the most current contact information and additional resources, students are advised to refer to the UGA website at [www.uga.edu](http://www.uga.edu)

#### **Disability Resource Center**

Provides Academic and Support Services

[www.dissvcs.uga.edu/](http://www.dissvcs.uga.edu/)

#### **Family & Graduate Housing**

[www.uga.edu/housing/gradfam/index.html](http://www.uga.edu/housing/gradfam/index.html)

#### **Veteran's Educational Benefits**

Office of the Registrar

106 Holmes/Hunter Academic Building

(706) 542-8772