

# **GRADUATE STUDENT MANUAL**

## **Agricultural and Biological Engineering Department**

### **Degrees through the College of Agriculture and Life Sciences**

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# Contact Information

Throughout this manual references will be made to several people by their position names. The following is current contact information for those positions:

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## Introduction

This Graduate Student Manual is for the use of graduate students and faculty in the Agricultural and Biological Engineering Department of the University of Florida. It contains policies, regulations and suggestions to help make the student's graduate career mutually beneficial to the student and the department. Our department offers graduate degrees in two colleges, the College of Engineering and the College of Agricultural and Life Sciences. This volume of the manual covers degrees offered through the College of Agriculture and Life Sciences.

Agricultural Operations Management (AOM) and Applied Science Master of Science degrees and Ph.D. degrees are offered through the College of Agricultural and Life Sciences. The AOM programs are for students who desire to advance their technical management skills through additional course work and graduate level research.

For students with basic science degrees, the Applied Science Masters and Ph.D. programs aim to produce graduates with strong capabilities in problem-solving, interdisciplinary research, and methods for applying science to real world problems and issues with emphases on (1) the use of engineering methods and approaches, such as mathematical modeling, optimization, and information technologies, in application of science to problems at various spatial and temporal scales, and (2) an interdisciplinary experience in research at the Ph.D. level.

The department offers a combined B.S. and M.S. degree program, which allows qualified students to earn both a bachelor's degree and a master's degree with a savings of one semester. Qualified students can begin their master's program while a senior and count up to 12 hours of graduate courses for both bachelor's and master's degree requirements. Please check the undergraduate catalog or contact the graduate coordinator for qualifications and details.

*The Graduate Catalog* (The University Record, University of Florida, Graduate Catalog, <http://gradcatalog.ufl.edu/index.php?catoid=4>) contains additional applicable information. This department manual is intended to supplement rather than duplicate the *Graduate Catalog*. The student should rely on the *Graduate Catalog* as a final authority except where a more stringent requirement may be imposed by the college or department. The student may graduate under the requirements of any one catalog in effect during their enrollment. The requirements stated in the catalog constitute a contract between the university and the student. <http://gradcatalog.ufl.edu/>

An exception or exemption from the policies stated in this manual may, in certain cases, be appropriate. Requests for exception or exemption will be reviewed by the graduate committee when submitted in writing, after approval has been granted by the supervisory committee.

## Admissions Policy

### General

Admission to a master's degree program requires a 3.00 upper division grade point average (GPA) (based on a 4.00 system) submission of scores from the Graduate Record Examination (GRE). The minimum requirements for admission into the Ph.D. degree program are a 3.00 upper division undergraduate GPA, 3.25 graduate GPA and submission of scores from the GRE. No student who has failed a qualifying exam or final graduate exam at another University of Florida department will be admitted for graduate study in the Agricultural and Biological Engineering Department.

International students whose native tongue is not English must submit TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing System) scores. A minimum score of 80 on the internet-based version, 213 on the computer-based or 550 on the paper-based TOEFL is required. The minimum score for the ILETS is 6.0. Conditional admission may be offered by the departmental graduate committee to students who do not satisfy the admission criteria including the cases of a deficiency in the GRE, TOEFL, ILETS or GPA requirements. A conditionally-admitted student must meet the conditions set forth in his/her admission letter in order that subsequent registration may be allowed.

International students who have spent at least 1 academic year in a baccalaureate or post-baccalaureate degree program at a college or university in a country where English is the official language, are exempt from taking the TOEFL exam if their attendance was in the year immediately prior to UF admission. Students from countries where English is widely spoken are exempt from taking the TOEFL exam. A list of exemptions is on the Graduate School's web site: <http://graduateschool.ufl.edu/admission/english-exemption-countries>

The entire application packet of students is considered when admission decisions are made; however, the GRE Score is a very important factor in decisions. English is not the first language of many of our graduate students, so Verbal GRE scores of our current CALS graduate students range from 140 to 168. Quantitative GRE scores of students currently enrolled in Masters programs in the CALS range from 148 to 161 with an average of 150. Quantitative GRE scores of students currently enrolled in PhD programs in the CALS range from 151 to 168 with an average of 157

The deadlines for applying for admission to the ABE graduate program are January 15th for applications for the Fall semester and July 15th for applications for the Spring semester. All scores and materials must be received by the stated deadline. Apply as soon as possible to receive full consideration for assistantships and fellowships.

We offer a combined BS/MS degree through which up to 12 credits of graduate courses may be double-counted toward credit fulfillment of the [BS and MS degrees](#). To qualify, the following requirements must be met:

1. Senior status (4EG)
2. Minimum upper division GPA of 3.3
3. Completion of 20 credit hours of courses required for the AOM Bachelors Degrees.
4. Acceptable Verbal, Quantitative and Analytical Writing GRE Scores.

Replacement of elective credit within the BS option should be considered first, although it may be possible to substitute required AOM courses with approved graduate courses. The Department's Undergraduate Coordinator must approve such substitutions. Please check the undergraduate catalog or contact the Undergraduate Coordinator for qualifications and details.

Admission to the AOM Master of Science program in the College of Agricultural and Life Sciences requires a B.S. degree in Agricultural Operations Management or an equivalent undergraduate program (see [Appendix B](#)). Students who do not have an undergraduate Agricultural Operations Management degree or equivalent and desire a Master of Science degree in the College of Agricultural and Life Sciences must complete equivalent requirements through articulation.

Admission to the Applied Science M.S. program requires a B.S. degree in a basic science field with courses including analytic geometry, calculus, differential equations, 8 credits of general physics and 8 credits of general chemistry, or equivalent. If these requirements are not already met the student must articulate to meet them.

Admission to the AOM Ph.D. program requires a B.S. degree in AOM or a related discipline. Students who do not have an undergraduate Agricultural Operations Management degree or equivalent and desire a PhD degree in AOM through the College of Agricultural and Life Sciences must complete equivalent requirements through articulation ([see appendix B](#)).

Admission to the Applied Science Ph.D. program requires a B.S. degree in a basic science field and a master's degree in a science or engineering field with courses including analytic geometry, calculus, differential equations, 8 credits of general physics and 8 credits of general chemistry, or equivalent. If these requirements are not already met the student must articulate to meet them.

## Academic Advisor and Supervisory Committee

Students will be admitted only after a faculty advisor has been identified to serve as Major Professor and Chair of the student's Supervisory Committee. Prospective students are encouraged to contact ABE faculty in their area of interest. In addition to the advisor, the student is required to have a supervisory committee consisting of approved graduate faculty members. The advisor will serve as Supervisory Committee Chair. Purposes of the student's supervisory committee are: 1) to guide, inform, and counsel the student; 2) to discuss and approve a plan of study; 3) to discuss and approve a thesis or dissertation topic and research project proposal; 4) to review progress and provide advice during the student's research; and 5) to conduct the qualification (for Ph.D. students) and final examinations.

For a Master's degree program, the supervisory committee must consist of:

- no fewer than 3 members
- 2 members who are full-time permanent faculty members of the ABE graduate faculty
- 1 member from outside the ABE department

For a Ph.D degree program, the supervisory committee must consist of:

- no fewer than 5 members.
- at least 2 members who are full-time permanent faculty members of the ABE graduate faculty
- 1 external member (as described below)

All committees are required to have an external member who is a member of the graduate faculty of another University of Florida department. Faculty members of other departments who are affiliate members of the ABE department cannot serve as the external member required by the Graduate School. Faculty members from other universities cannot serve as the external member required by the Graduate School.

Students are encouraged to develop a close working relationship with their advisor and supervisory committee members and to communicate academic and department interests and concerns to them. Each student should schedule at least a one-hour meeting with his/her advisor each week to insure adequate communication.

An effective graduate degree program requires that course work, research and assistantship duties all reinforce the student's educational objectives. To facilitate this coordination, the supervisory committee should be formulated and submitted to the departmental graduate committee for approval during the start of their 2<sup>nd</sup> semester of study ([see Appendices E and F](#)). **A registration hold will be placed on all students not completing their committee as required.**

## Plan of Study

Each plan of study is unique to the individual student and should to meet the student's goals and career objectives as well as to being cohesive and concentrated in an area of study. Graduate students and their supervisory committees are expected to complete a plan of study by the end of the student's second term in Graduate School ([see Appendices E and F](#)). A plan of study must be submitted to the graduate committee no later than the end of the 2<sup>nd</sup> semester of study. Each student's plan of study must satisfy all requirements of the Graduate School and the Department as stated in the *Graduate Catalog* and this manual. **A registration hold will be placed on all students not completing their plan of study as required.**

Graduate credit is awarded for courses numbered 5000 and above. The work in the major field must be in courses numbered 5000 or above. For work outside the major, courses numbered 3000 or above, not to exceed 6 credits, may be taken provided they are part of an approved plan of study. None of the courses below the 5000 level with an ABE, AOM or PKG prefix may

be used toward meeting the minimum requirements. Courses in the Agricultural and Biological Engineering Department below the 5000-level and courses required for undergraduate degrees should be included on a plan of study as articulation courses in excess of the minimum requirements.

The required Supervisory Committee and Plan of Study templates are available on the department's website <http://www.abe.ufl.edu/academics/graduate/graduate-manuals/index.shtml>. After a plan of study has been approved by the student's supervisory committee, a copy with the signature of the student's advisor must be provided to the Coordinator of Academic Support Services for submission to the departmental graduate committee for final approval.

Since a supervisory committee and plan of study are formulated early in the program, it is likely that a student may wish to change a plan of study, committee, or even an advisor. There should be no hesitancy to make changes that are recognized to be educationally sound. If it becomes necessary to amend an approved plan of study, changes must be approved by the supervisory committee chair and the departmental graduate committee.

### *Non-Thesis Masters Degree Option*

PhD students can obtain a non thesis masters if they have completed 30 or more hours of coursework that satisfies the math/quantitative, seminar, supervised teaching and the 15 hour Major course requirements of their college. The non thesis masters program requires a supervisory committee and plan of study. The supervisory committee and plan of study must be approved by the Graduate Committee no later than the semester prior to the term in which the degree is awarded. Students must be registered in 3 hours of coursework related to the MS degree during the semester of graduation. Students may not be registered only in PhD research.

### *Transfer of Credit*

#### *Courses Taken as a Graduate Student at another institution:*

Courses open only for graduate credit (5000 and above) earned with a grade of A, A-, B+, or B may be transferred from an institution approved for this purpose by the Graduate School. Acceptance of transfer credit requires approval of the student's supervisory committee Chair or the Graduate Coordinator, the college dean, and the Graduate School. Transfer of credit may be considered from course work taken after completion of the undergraduate degree. Transfer coursework must be taken within the 7 years immediately preceding the date that the degree is to be awarded. Courses with "P" or "S" grading cannot be transferred. Transfer hours cannot be split (e.g. 9 hours taken, 8 transferred). A maximum of 9 credit hours may be transferred under the above guidelines as part of a master's program.

For PhD programs, a maximum of 24 course credits and a maximum of 6 research credits can be transferred from a master's program into the PhD plan of study. The course credits transferred must be appropriate to the PhD and be an integral part of the student's plan of study. Follow the procedure below for transfer of credit. An **official final** transcript from the previous institution must be on file with the UF Admissions Office.

For a Ph.D. program, a maximum of 15 credit hours beyond the master's degree taken at an institution offering the doctoral degree may be transferred in addition to the 30 credit hours allowed for the master's degree.

#### *Courses Taken as an Undergraduate Student at UF:*

University of Florida undergraduates who subsequently enroll in Graduate School may transfer a maximum of 15 credits of 5000 or 6000 level courses, earned with a grade of A, A-, B+, or B, taken as an undergraduate, provided (1) the courses to be transferred are in excess of the undergraduate degree requirements, and (2) the student had a 3.0 GPA at the time the courses were taken.

#### *Courses Taken as a Graduate Student at UF:*

For Ph.D. programs, a maximum of 24 course credits and a maximum of 6 research credits can be transferred from a master's program into the Ph.D. plan of study. The course credits transferred must be appropriate to the Ph.D. and be an integral part of the student's plan of study.

For a Ph.D. program, a maximum of 15 credit hours beyond the master's degree taken at UF may be transferred in addition to the 30 credit hours allowed for the master's degree.

*Transfer of Credit Request:*

If a student meets all requirements, the faculty advisor or student must then submit an email request to the Coordinator of Academic Support Services to process a transfer credit request. The request must be received by the Graduate School no later than 4:00 p.m. on the last day of classes of the first term of graduate study. *An official, final transcript of the student's master's program must be on file at the UF admissions office or the transfer of credit will not be processed.*

*Concurrent Graduate Programs:*

ABE students interested in pursuing a second master's degree from another department or pursuing a second master's degree from the ABE Department (ABE or AOM) concurrently must obtain written approval from each academic unit and the Graduate School Dean. The student must be officially admitted to both programs through regular procedures. No more than 9 credits from the first program may be applied toward the second. Contact the academic unit(s) for details.

Students currently enrolled in a graduate degree in another department at UF can pursue a concurrent master's degree in the ABE Department. Students must apply for admission to the ABE graduate program and be admitted. Students must fill out and obtain appropriate signatures on the Graduate School Concurrent Degree Program Form (<http://graduateschool.ufl.edu/files/concurrent-degree-program-form.pdf>)

*Time Limitation*

All work, including transferred credits, counted toward the master's degree must be completed during the 7 years immediately preceding the date on which the degree is awarded. All master's degrees counted in the minimum course requirements for a Ph.D. degree must have been earned in the last 7 years.

## Research Project Proposal

Ph.D. and master's students (thesis option) are expected to develop a research proposal for approval by their supervisory committee. The research proposal serves as a guideline for the student's research program. All graduate research projects are expected to include both analytical and experimental components. Copies should be provided to each member of the supervisory committee.

Graduate students are expected to submit an initial research proposal to the Coordinator of Academic Support Services ([see Appendices E and F](#)) no later than the end of their second semester of study. A registration hold will be placed on all students not completing their research proposal as required. This initial proposal should identify the research topic, state the proposed objective of the research project and present a time line for the student's graduate program:

1. Cover page with proposed thesis or dissertation topic or title, student's name, degree objective, and names of supervisory committee members. The cover page must be signed by the Supervisory Committee Chair indicating approval of the proposed research by all of the supervisory committee members.
2. Objectives - should be concise and logical.
3. Timetable - should indicate anticipated deadlines for completing various aspects of the research project.

<b>Requirement</b>	<b>Semester</b>	<b>Year</b>
Admission to ABE Graduate Program		
Completion of Coursework		
Qualifying Exam (for PhD students)		
Final Exam		
Expected Graduation Date		
End of Assistantship Funding ( <i>as stated on original Letter of Offer</i> )		

The initial research proposal should be brief (1-2 pages text, plus 1 page for timetable. The student should continue to develop the initial research proposal into a full research proposal under the guidance the student's supervisory committee.

# Requirements for Agricultural Operations Management Master of Science Degree

Admission to the AOM Master of Science program in the College of Agricultural and Life Sciences requires a B.S. degree in Agricultural Operations Management or an equivalent undergraduate program (see Appendix B). Students who do not have an undergraduate Agricultural Operations Management degree or equivalent and desires a Master of Science degree in the College of Agricultural and Life Sciences must complete equivalent requirements through articulation. Articulation courses do not count toward the 30 credit hours required for the master's program of study.

Each plan of study for an AOM Master of Science degree with thesis in the College of Agricultural and Life Sciences must have a minimum of 24 course credits plus up to 6 hours of thesis research, for a total of 30 hours. The plan of study must include a minimum of 12 combined credits of AOM, ABE or PKG courses at the 5000 level or higher (Non-Thesis programs must include 15 hours of departmental coursework) and a minimum of 3 credits of statistics at the 5000 level or above. *(Students wishing to use credit from a graduate statistics course not listed in the ABE Graduate Manual (Appendix C) or from another institution must provide a copy of the syllabus for approval by the ABE Graduate Committee).*

A master's degree with thesis must include a minimum of 3 credits of thesis research (ABE 6971). Additional thesis research credits may be taken to meet minimum registration requirements; however, the additional credits will not count toward meeting the credit requirements of the degree. **Students are required to take research credits during their semester of graduation (3 Fall/Spring, 2/Summer).** Graduate credit is awarded for courses numbered 5000 and above. The work in the major field must be in courses numbered 5000 or above. *Statistics courses and courses in the minor field cannot be substituted for departmental major courses (ABE/AOM/PKG).* For work outside the major, courses numbered 3000 or above, not to exceed 6 credits, may be taken provided they are part of an approved plan of study.

A maximum of 3 credits of AOM/ABE/PKG 6905 may be applied toward the minimum requirements for any single Masters degree. These credits will be considered for approval only when a description of the course content is filed with the plan of study. The student must obtain advisor approval before taking the course. The topic of the project must be in an area UNRELATED to the student's thesis.

Master's students *who entered the ABE graduate program in Fall 2011 and beyond*, are required to include one hour of ABE6940 in their Plans of Study. Master's students are allowed to take a maximum of 3 credits of supervised teaching (ABE 6940). Typically 20 to 30 hours of work is required to support 1 hour of supervised teaching. Students will be placed in assignments that best suit the needs of the ABE Department. *All graduate students are required to take the on-line FERPA training prior to enrollment in ABE6940.*

## *Thesis/Nonthesis Option*

AOM Masters degree students may choose a nonthesis 30 credit coursework only degree option. Normally, graduate assistantships will not be available to students pursuing nonthesis degrees. The nonthesis plan of study must include a minimum of 15 credits of major courses at the 5000 level or above that defines a meaningful, integrated area of academic concentration. Students may include a design or analysis project in their plan of study by enrolling in a maximum of 3 credits of AOM/PKG/ABE 6905. The topic of the project must be in an area UNRELATED to the student's thesis or field of study.

All students pursuing nonthesis degrees are required to present a seminar to their Supervisory Committee in the final semester of their graduate program. The seminar topic should be related to the student's area of interest. The seminar is open to the Department.

A comprehensive written and/or oral examination may also be required at the discretion of the student's committee. If required, the comprehensive examination generally covers academic preparation and basic principles and applications in addition to any design or analysis project report. A final exam can be taken no sooner than two semesters after approval of a student's plan of study and project proposal.

Students who receive financial support from the department during the course of their Masters program, are required to prepare publishable reports describing their analysis or research.

## *Major Area*

The plan of study must include a minimum of 12 credits (15 credits for a nonthesis degree) of departmental ABE, PKG or AOM major courses at the 5000 level or above that defines a meaningful, integrated area of academic concentration (excluding ABE 6910 and ABE 6971). One hour of seminar (ABE 6931) and one hour of Supervised Teaching (ABE6940) is to be included in the major.

### *Minor Area (optional)*

A minor consists of a minimum of 6 hours of course work in a focused area related to the field of major study. Course work in the minor for the master's degree is not limited to the course offerings of one department, provided that the minor has a clearly stated objective. The combination of courses selected for the minor must be planned as part of the plan of study. A graduate faculty member, who clearly represents the interdisciplinary minor, must be included on the supervisory committee. If a minor is included as part of the plan of study, then no courses from the department of the minor can be included in the major.

## **Requirements for Applied Science Master of Science Degree**

For students with basic science B.S. Degrees, the Applied Science M.S. Program through the College of Agricultural and Life Sciences aims to produce graduates with strong capabilities in problem-solving, interdisciplinary research, and methods for applying science to real world problems and issues with emphasis on the use of engineering methods and approaches, such as mathematical modeling, optimization, and information technologies in application of science to problems at various spatial and temporal scales.

Admission to the Applied Science M.S. Program requires a B.S. Degree in a basic science field with courses including analytic geometry, calculus, differential equations, 8 credits of general physics and 8 credits of general chemistry, or equivalent. If these requirements are not already met, the student must articulate to meet them. ([See Appendix B](#)). Articulation courses do not count toward the 30 credit hours required for the master's program of study.

Each plan of study for an Applied Science Master of Science degree in the College of Agricultural and Life Sciences must include 30 hours. Thesis degrees must have a minimum of 24 course credits plus up to 6 hours of thesis research, for a total of 30 hours. The plan of study must include a minimum of 12 combined credits of AOM, ABE or PKG courses at the 5000 level or higher.

Requirements for a master's degree with thesis must include a minimum of 3 credits of thesis research (ABE 6971). **Students are required to take research credits during their semester of graduation (3 Fall/Spring, 2/Summer).** Additional thesis research credits may be taken to meet minimum registration requirements; however, the additional credits will not count toward meeting the credit requirement of the degree. Graduate credit is awarded for courses numbered 5000 and above. The work in the major field must be in courses numbered 5000 or above. *Courses in the minor field cannot be substituted for departmental major courses (ABE/AOM/PKG).* For work outside the major, courses numbered 3000 or above, not to exceed 6 credits, may be taken provided they are part of an approved plan of study.

Plans of study for thesis and non-thesis Applied Science Master of Science degrees must include a minimum of 9 credit hours of quantitative courses including mathematics at the 5000 level or above; engineering, modeling, simulation, and optimization methods; and applied statistics and/or probability. These quantitative courses must include 3 credits selected from the approved list of math or applied statistics courses in [Appendix C](#). (*Students wishing to use credit from a graduate statistics or math course not listed in the ABE Graduate Manual or from another institution must provide a copy of the syllabus for approval by the ABE Graduate Committee*).

The remaining 6 hours of quantitative courses may be selected from other courses in [Appendix C](#) or the example list in [Appendix D](#) or other similar courses. Beyond the 9-credit minimum quantitative course requirement, students should take additional math, information technology, systems analysis, optimization, microbiology, biology, chemistry, ecology, etc. as appropriate.

A maximum of 3 credits of AOM/ABE/PKG 6905 may be applied toward the minimum requirements for any single Masters degree. These credits will be considered for approval only when a description of the course content is filed with the plan of study. The student must obtain advisor approval before taking the course. The topic of the project must be in an area UNRELATED to the student's thesis.

Master's students *who entered the ABE graduate program in Fall 2011 and beyond* are required to include one hour of ABE6940 in their Plans of Study. Master's students are allowed to take a maximum of 3 credits of supervised teaching (ABE 6940). Typically 20 to 30 hours of work is required to support 1 hour of supervised teaching. No ABE 6910 (supervised

research) credits are allowed on the master's degree with thesis plan of study. Students will be placed in assignments that best suit the needs of the ABE Department. *All graduate students are required to take the on-line FERPA training prior to enrollment in ABE6940.*

### *Thesis/Nonthesis Option*

Applied Science Masters degree students may choose a nonthesis 30 credit coursework only degree option. Normally, graduate assistantships will not be available to students pursuing nonthesis degrees. The nonthesis plan of study must include a minimum of 15 credits of major courses at the 5000 level or above that defines a meaningful, integrated area of academic concentration. Students may include a design or analysis project in their plan of study by enrolling in a maximum of 3 credits of AOM/PKG/ABE6905. The topic of the project must be in an area UNRELATED to the student's thesis or area of study.

All students pursuing nonthesis degrees are required to present a seminar to their Supervisory Committee in the final semester of their graduate program. The seminar topic should be related to the student's area of interest. The seminar is open to the Department.

A comprehensive written and/or oral examination may also be required at the discretion of the student's non-thesis committee. If required, the comprehensive examination generally covers academic preparation and basic principles and applications in addition to any design or analysis project report. A final exam can be taken no sooner than two semesters after approval of a student's plan of study and project proposal.

Students who receive financial support from the department during the course of their Masters program, are required to prepare publishable reports describing their analysis or research.

### *Major Area*

The plan of study must include a minimum of 12 credits (15 credits for a nonthesis degree) of departmental ABE, PKG or AOM major courses at the 5000 level or above that defines a meaningful, integrated area of academic concentration (excluding ABE 6910 and ABE 6971). One hour of seminar (ABE 6931) and one hour of Supervised Teaching (ABE 6940) is to be included in the major.

### *Minor Area (optional)*

A minor consists of a minimum of 6 hours of course work in a focused area related to the field of major study. Course work in the minor for the master's degree is not limited to the course offerings of one department, provided that the minor has a clearly stated objective. The combination of courses selected for the minor must be planned as part of the plan of study. A graduate faculty member, who clearly represents the interdisciplinary minor, must be included on the supervisory committee. ABE students cannot obtain minors in Packaging Science or Agricultural Operations Management. If a minor is included as part of the plan of study, then no courses from the department of the minor can be included in the major.

## **Requirements for the AOM Doctor of Philosophy Degree**

Admission to the AOM Ph.D. program requires a B.S. or Masters degree in AOM or related agricultural management discipline (see Appendix B). Students who do not have an undergraduate or Masters degree in Agricultural Operations Management or equivalent and desire a PhD degree in AOM through the College of Agricultural and Life Sciences must complete equivalent requirements through articulation. Articulation courses do not count toward the 54 credit hours of coursework required for the PhD program of study.

The AOM Ph.D. degree in the College of Agricultural and Life Sciences is an advanced degree in technical management. It emphasizes managerial, quantitative techniques, and technologies as applied to agricultural business and operations management. A Ph.D. degree plan of study is based on all work completed beyond the B.S. degree, with a required minimum of 54 course work credits and a total of 90 credits including research credits. **Students are required to take research credits during their semester of graduation (3 Fall/Spring, 2/Summer).** Graduate credit is awarded for courses numbered 5000 and above. The work in the major field must be in courses numbered 5000 or above. *Courses in the minor field cannot be substituted for departmental major courses (ABE/AOM/PKG).* For work outside the major, courses numbered 3000 or above, not to exceed 6 credits, may be taken provided they are part of an approved plan of study. The plan of study must

include concentrations in the Quantitative Area, and the Operations, Systems and Managerial Area. Each plan of study must include courses from the following groups:

**Quantitative Area (9 hrs minimum)**

All Ph.D. students must achieve a level in mathematics equivalent to survey of calculus (MAC 2233). All students must include in their plan of study at least 9 hours of the following statistics courses or their equivalent:

STA 5106 (1) Computer Programs in Statistical Analysis  
STA 6166 (3) Statistical Methods in Research I  
STA 6167 (3) Statistical Methods in Research II  
STA 6207 (3) Applied Statistical Methods  
STA 6208 (3) Regression Analysis  
STA 6209 (3) Design and Analysis of Experiments  
STA 6857 (3) Applied Time Series Analysis

**Operations, Systems and Management Area (9 hrs minimum)**

ABE 5643C (3) Biological and Agricultural Systems Analysis  
ABE 5646 (3) Biological and Agricultural Systems Simulation  
ABE 6644 (3) Agricultural Decision Systems  
AEB 6182 (3) Agricultural Risk Analysis and Decision Making  
AEB 6184 (3) Economics of Agricultural Production  
AOM 5315 (3) Advanced Agricultural Operations Management  
AOM 5334C (3) Agricultural Chemical Application Technology  
AOM 5435 (3) Advanced Precision Agriculture  
PKG 5002 (3) Advanced Packaging, Society & the Environment  
PKG 5003 (3) Advanced Distribution & Transport Packaging  
PKG 5006 (3) Advanced Packaging Principles  
PKG 5105 (3) Advanced Consumer Products Packaging  
PKG 5206C (3) Advanced Package Decoration  
PKG 5256C (3) Advanced Analytical Packaging Methods  
PKG 6100 (3) Advanced Computer Tools for Packaging  
CAP 5635 (3) Artificial Intelligence Concepts  
CAP 5805 (3) Computer Simulation Concepts  
CAP 6685 (3) Expert Systems  
ESI 6417 (3) Linear Programming and Network Optimization  
ISM 5021 (3) Information Systems in Organizations  
ACG 5005 (2) Financial Accounting  
ACG 5065 (3) Financial and Managerial Accounting  
ACG 5205 (3) Advanced Financial Accounting  
AEB 6106 (3) Microeconomic Principles and Analysis  
AEB 6145 (3) Agricultural Finance  
EIN 6357 (3) Advanced Engineering Economy  
MAN 5245 (3) Organizational Behavior  
MAN 6051 (3) Managerial Planning  
MAN 6321 (3) Human Resource Management  
MAR 5624 (3) Introduction to Managerial Statistics  
MAR 6506 (3) Customer Analysis

Students requiring exceptions to the above requirements to fulfill their personal or program goals should submit a request in writing to the department graduate committee. Any exceptions must be approved by the student's supervisory committee before submission to the department graduate committee.

A maximum of 3 credits of AOM/ABE/PKG 6905 may be applied toward the minimum requirements for any single PhD degree. These credits will be considered for approval only when a description of the course content is filed with the plan of study. The student must obtain advisor approval before taking the course. The topic of the project must be in an area UNRELATED to the student's thesis.

PhD students *who entered the ABE graduate program in Fall 2011 and beyond* are required to include a minimum of three hours of Supervised Teaching (ABE 6940) in their Plans of Study. A maximum of 5 credits of supervised teaching (ABE

6940) may be included in the student's plan of study. This maximum limit cannot be waived and it applies to the entire graduate career. Typically 20 to 30 hours of work is required to support 1 hour of supervised teaching. Students will be placed in assignments that best suit the needs of the ABE Department. *All graduate students are required to take the on-line FERPA training prior to enrollment in ABE6940.*

The plan of study can include 6 hours of research credit transferred from the master's degree. Additional dissertation research credits may be taken to meet minimum registration requirements; however, the additional credits will not count toward meeting minimum degree requirements. No student can enroll for dissertation research credits (ABE 7980) before passing the qualifying examination.

### *Major Area*

The plan of study must include a minimum of 12 credits of major courses at the 5000 level or above that defines a meaningful, integrated area of academic concentration. The minimum number of ABE or AOM credits is 12 (excluding ABE 6910, ABE 6971, ABE 7979, and ABE 7980). Students who fulfilled the ABE6931 Seminar requirement during an ABE master's program are not required to take it again. A maximum of 3 hours of ABE6940 may be counted toward the 12 hours of ABE required coursework.

### *Minor Area (optional)*

For the PhD degree, a minimum of 12 credits at the 5000 level or higher is required for a minor in a certain department or program area as approved by the minor department or program area representative(s) on the supervisory committee. If two minors are selected, then each minor must consist of at least 8 credits. Course work in the minor is not limited to the course offerings of one department, provided that the minor has a clearly stated objective. The combination of courses selected for the minor needs to be as part of the plan of study. A graduate faculty member must be included on the supervisory committee who clearly represents the interdisciplinary minor.

## **Requirements for the Applied Science Doctor of Philosophy Degree**

Admission to the Applied Science Ph.D. program requires a B.S. degree in a basic science field or a master's degree in a science or engineering field with courses including analytic geometry, calculus, differential equations, 8 credits of general physics and 8 credits of general chemistry, or equivalent. If these requirements are not already met, the student must articulate to meet them. ([See Appendix B](#)). Articulation courses do not count toward the 54 credit hours of coursework required for the PhD program of study.

The Applied Science Ph.D. degree in the College of Agricultural and Life Sciences is an advanced degree providing training in problem solving capabilities, interdisciplinary research, and methods for applying science to real world problems and issues with emphases on (1) the use of engineering methods and approaches, such as mathematical modeling, optimization, and information technologies, in application of science to problems at various spatial and temporal scales, and (2) an interdisciplinary experience in research at the Ph.D. level.

A Ph.D. degree plan of study is based on all work completed beyond the baccalaureate, with a required minimum of 54 course work credits and a minimum total of 90 credits including research credits. **Students are required to take research credits during their semester of graduation (3 Fall/Spring, 2/Summer).** Graduate credit is awarded for courses numbered 5000 and above. The work in the major field must be in courses numbered 5000 or above. *Courses in the minor field cannot be substituted for departmental major courses (ABE/AOM/PKG).* For work outside the major, courses numbered 3000 or above, not to exceed 6 credits, may be taken provided they are part of an approved plan of study. The plan of study must include a minimum of 12 credit hours of quantitative courses including 3 hours of graduate level mathematics including engineering, modeling, simulation, and optimization methods; and applied statistics and/or probability. These quantitative courses must include 3 credits selected from the approved list in [Appendix C](#). The remainder of the 12-credit minimum quantitative courses may be selected from the example list in [Appendix D](#) or other similar courses.

Beyond the 12-credit minimum quantitative course requirement, students should take additional math, information technology, systems analysis, optimization, microbiology, biology, chemistry, ecology, etc. as appropriate. Students are encouraged to include interdisciplinary discussion group courses in their plans of study. This will provide students the opportunity to interact with faculty and students whose research contributes to solutions of complex problems and gain experience in working across disciplinary boundaries. The student is encouraged to have at least two committee members from other disciplines and from other institutions where there is strength in the chosen research area when feasible.

A maximum of 3 credits of AOM/ABE/PKG 6905 may be applied toward the minimum requirements for any single Masters degree. These credits will be considered for approval only when a description of the course content is filed with the plan of study. The student must obtain advisor approval before taking the course. The topic of the project must be in an area UNRELATED to the student's dissertation.

PhD students are required to include a minimum of three hours of Supervised Teaching (ABE 6940) in their Plans of Study. A maximum of 5 credits of supervised teaching (ABE 6940) may be included in the student's plan of study. This maximum limit cannot be waived and it applies to the entire graduate career. Typically 20 to 30 hours of work is required to support 1 hour of supervised teaching. Students will be placed in assignments that best suit the needs of the ABE Department. *All graduate students are required to take the on-line FERPA training prior to enrollment in ABE6940.*

The plan of study may include a maximum of 36 credit hours of dissertation research including up to 6 hours of research credit transferred from the master's degree. Additional dissertation research credits may be taken to meet minimum registration requirements; however, the additional credits will not count toward meeting degree requirements. No student can enroll for dissertation research credits (ABE 7980) before passing the Ph.D. qualifying examination.

### *Major Area*

The plan of study must include a minimum of 12 credits of major courses at the 5000 level or above that defines a meaningful, integrated area of academic concentration. The minimum number of combined ABE, AOM or PKG credits is 12 (excluding ABE 6910, ABE 6971, ABE 7979, and ABE 7980). Students who fulfilled the ABE6931 Seminar requirement during an ABE master's program are not required to take it again. A maximum of 3 hours of ABE6940 may be counted toward the 12 hours of ABE required coursework.

### *Minor Area (optional)*

For the PhD degree, a minimum of 12 credits at the 5000 level or higher is required for a minor in a certain department or program area as approved by the minor department or program area representative(s) on the supervisory committee. If two minors are selected, then each minor must consist of at least 8 credits. Course work in the minor is not limited to the course offerings of one department, provided that the minor has a clearly stated objective. The combination of courses selected for the minor needs to be as part of the plan of study. A graduate faculty member must be included on the supervisory committee who clearly represents the interdisciplinary minor.

## **Grade Point Requirements for Graduation**

The appropriate grade point requirements for graduation are:

1. A minimum 3.00 GPA in all graduate level courses at the University of Florida.
2. A minimum 3.00 GPA in all courses that comprise the major. In this case, the major is not just ABE, PKG and AOM courses. The major also includes courses from other departments that have been declared a part of the major.

## **Registration**

Registration for course work each term is the responsibility of the student. Course registration should conform to the student's plan of study, and the minimum and maximum hours of registration as stated in the Graduate School Catalog (under General Regulations). Course selection for each term should be made in close consultation with the advisor. A student must be registered for an appropriate load during the term in which he/she graduates ([see Table 1](#)). Students not registered by the end of the Drop/Add period each semester must be dropped from their assistantship or fellowship.

Students who neglect to register on time will be responsible for personally paying the late registration fee. The ABE department WILL NOT pay this fee for students out of departmental funding.

## **Dropping Courses**

The Graduate School has no rigid policy concerning graduate students dropping courses other than each graduate student must maintain a minimum registration in order to continue receiving assistantship or fellowship support. After the normal drop/add period, each request to drop a course must be approved by the chair of the student's supervisory committee. International students may need clearance from the UF International Center to process a late drop/add.

After Drop/Add, students must petition their graduate department for all schedule changes, which are then reviewed and processed by the College of Agricultural and Life Sciences.

If a student successfully petitions to both drop AND add a course after Drop/Add:

- The change is processed as two actions, a drop and an add.
- **The student will be fee liable for both the course dropped and the course added to his/her schedule.**

If there is no university error and the student believes the fees for the dropped course should be waived due to an extenuating circumstance, the student must submit a petition to the University Petitions Committee.

*TABLE 1. Minimum Registration Requirements*

[Click here](#) for a complete list of all graduate student registration requirements:

Note: For students on appointment for the full summer, registration must total that specified for C term. Registration may be in any combination of A, B, or C terms. However, courses must be distributed so that the student is registered during each term on appointment.

	Fall & Spring	Summer		
		A	B	or C
Full-Time Graduate Students not on Appointments	9-12	4	4	8
Assistants on .25 - .74 and/or 1/4, 1/3, & 1/2-Time Assistants	9	3	3	6
Graduate students not on appointment but using University facilities and/or faculty time	3	1	& 1	or 2
Graduate Students not on Appointment during Final Term	3	1	& 1	or 2

## Tuition and Financial Aid

Payment of fees by the dates listed in the front of the *Graduate Catalog* is an integral part of the registration process. For students classified as non-Florida residents, the tuition charges are considerably higher than for Florida residents. See the *Graduate Catalog* for State residency requirements. Normally, students on graduate assistantships of 1/4 time or greater will be issued tuition waivers for about 95% of the cost of tuition, subject to availability of funds. All students are responsible for paying their required fees and any remaining tuition regardless of the value of fee waivers.

A graduate student with an assistantship, fellowship, or traineeship must not accept other aid without Graduate School permission and must be registered in accordance with the schedule shown in Table 1.

All non-Florida students who are U.S. citizens or permanent residents are eligible for out-of-state fee waivers the year after they have filed for Florida residency status. It is the student's responsibility to file for Florida residency status when they first enroll at UF. The detailed procedures and requirements are outlined in the [Graduate Catalog](#).

Financial aid in the form of scholarships and loans may be available to highly qualified graduate students. In general, such awards are available to students pursuing either Master's or Ph.D. degrees. For information concerning availability of scholarships and loans and the necessary qualifications, students should contact the Dean's Office in the College of Agriculture and the Office for Student Financial Affairs.

## Normal Progress

Students in pursuit of the Master of Science and Doctor of Philosophy degrees are expected to complete at least the minimum hourly requirement each term and to maintain an acceptable academic grade point average. An acceptable GPA is understood to mean 3.00. Students who fall below these standards will be considered to be on academic probation. If a student remains below this standard for two consecutive terms, he/she is subject to termination.

A master's degree is expected to be completed within two years and a Ph.D. degree within four calendar years of study. The student's progress will be formally assessed by the Supervisory Committee Chair at the end of each term to determine whether he/she should be continued in the program and whether he/she should continue receiving financial assistance from the department.

## Graduate Seminar Course and Departmental Seminars

All graduate students attending classes on the UF campus are required to register for 1 credit of ABE 6931 during the first or second semester of the first graduate degree.

Students who will not be on campus for most of their academic program and who are located at Research Units can satisfy seminar requirements by

- Coordinating with the faculty instructor for ABE 6931
- Enrolling in ABE 6931 (distance section)
- Participating in center seminar series under supervision of their major professor

REC students must contact the Academic Services Coordinator to have a special section created for this course. Students pursuing additional degrees are not required to take a second seminar class.

Students are expected to attend at least 50% of all departmental seminars. Students are encouraged to suggest topics and speakers of particular professional interest for departmental seminars.

All graduate students are required to present a seminar to the department at the end of their graduate programs. This can be the presentation given during the defenses of Ph.D.s and Masters with thesis. Nonthesis Masters students should present a seminar related to their area of study.

## Thesis and Dissertation

Students begin work toward a thesis or dissertation from the time they enter Graduate School. Careful planning and a timetable will help avoid delays as well as give the student valuable training.

Resources for preparation of theses and dissertations are available at the Graduate School Editorial Office and also online (<http://gradschool.rgp.ufl.edu/editorial/introduction.html>). For technical support in creating an electronic thesis or dissertation, see <http://www.circa.ufl.edu/~etd/>.

The thesis or dissertation is to be developed by students with the supervision and criticism of their advisors. Students and their advisors may agree to prior review of the thesis, either section-by-section or in its entirety or both. When the advisor is satisfied that the document is ready for review by the supervisory committee, the advisor will authorize distribution. Students should expect several major changes and corrections in their thesis or dissertation to be required by the supervisory committee. Therefore, students must allow enough time to make required changes. Students must submit the final draft of the thesis or dissertation to members of the supervisory committee at least 10 working days prior to the date of the final exam. The final draft should be complete in every respect including figures, tables, and bibliography, but in a form to allow for incorporation of editorial and/or substantive changes with minimal expense or inconvenience to the student. Turn-around

time for thesis reviews can often be considerably reduced if the graduate student notifies the committee members in advance of the date when draft copies will be submitted for review.

The thesis or dissertation must be defended in time to meet Graduate School Deadlines. The Graduate School requires that Masters theses be defended before first submission to the Graduate School. The first submission for PhD dissertations can be before the dissertation defense. Guidelines for submission of theses and dissertation to the Graduate School can be found at: <http://graduateschool.ufl.edu/graduation/checklists>.

The student is required to distribute final copies of the thesis or dissertation to appropriate offices and faculty members. In addition, students should prepare a copy for themselves, their advisor, and other members of the supervisory committee who express a desire for a copy.

### *Thesis and Dissertation Deadlines*

Deadlines for the submission of original signature pages with theses or dissertations are published by the Graduate School each term <http://graduateschool.ufl.edu/graduation/deadlines>. The deadline for submission of signature pages for theses or dissertations is the same as the deadline for submission of the final exam form. In all cases, the student must schedule the oral examination prior to the deadline to allow time for corrections, since corrections are to be completed before final signatures. The department Coordinator of Academic Support Services must be notified of the examination time, date, location and dissertation or thesis title at least 10 days before the date of the examination.

The final oral examination is open to all interested graduate faculty. An announcement will be sent via email to departmental faculty and graduate students. The defense of the thesis or dissertation should be well prepared including any appropriate visual aids. One of the aims of the preparation should be to synthesize the important conclusions in a time-efficient presentation, on the order of 30 minutes, leaving ample time for questions and discussion. Normally 3 hours should be scheduled for the final oral examination.

## **Qualifying Examination for Ph.D. Degree**

All Ph.D. candidates must take the qualifying examination. It may be taken during the third term of graduate study beyond the bachelor's degree. The student must be registered in the term the qualifying examination is given.

The examination, prepared and evaluated by the full supervisory committee or the major and minor academic units, is both written and oral and covers the major and minor subjects. Except for allowed substitutions, all members of the supervisory committee must attend the oral part. The student and chair or co-chair must be in the same physical location. With approval of the entire committee, other committee members may attend remotely using modern technology. At this time the supervisory committee is responsible for deciding whether the student is qualified to continue work toward a Ph.D. degree.

If a student fails the qualifying examination, a re-examination may be requested, but it must be recommended by the supervisory committee. At least one term of additional preparation is needed before re-examination.

**Time lapse:** There must be at least 2 terms between the oral part of the qualifying examination and the date of the degree. The term the qualifying examination is passed is counted, if the examination occurs before the midpoint of the term. The written qualifying exam is to be coordinated and administered by the student's faculty advisor. The examination is to be developed within the guidelines that a reasonably competent PhD student can successfully complete the examination in approximately 24 hours. It is expected that each supervisory committee member will provide the student with a written exam. The written portion must be passed prior to taking the oral portion. Normally 3 hours should be scheduled for the oral portion of the qualifying examination. The qualifying examination may be conducted using video and/or telecommunications. However, the student and chair or co-chair must be in the same physical location. All other members may participate from remote sites via technological means. There may be one substitute participant who is not the chair or external member in special circumstances with prior approval.

If the student fails the written or oral examination, it is the committee's responsibility to decide when the student can retake another qualifying examination. Normally, a student will not be permitted to take either the written or oral qualifying examination more than two times.

Following successful completion of both written and oral qualifying examinations, the student is eligible for PhD candidacy. In addition to successfully completing the qualifying examinations, the student must have chosen his/her dissertation topic

and must have a minimum of 3.00 GPA both in the major and must maintain an overall 3.0 GPA for all work attempted in the graduate program.

***Time Limitation:*** All work for the doctorate must be completed within 5 calendar years after the qualifying examination, or this examination must be repeated.

## **Final Examinations**

The comprehensive oral examinations and the oral defense of a thesis, project or dissertation may be conducted using video and/or telecommunications. However, the student and chair or co-chair must be in the same physical location. All other members may participate from remote sites via technological means. There may be one substitute participant who is not the chair or external member in special circumstances with prior approval.

### *Master of Science, Thesis Option*

The examination covers the thesis research, and may also cover academic preparation and basic principles and applications. A final exam can be taken no sooner than two semesters after approval of a student's plan of study and research proposal.

### *Master of Science, Nonthesis Option*

All students pursuing Nonthesis degrees are required to present a seminar to their Supervisory Committee in the final semester of their graduate program. The seminar topic should be related to the student's area of interest. The seminar is open to the Department.

A comprehensive written and/or oral examination may also be required at the discretion of the student's non-thesis committee. If required, the comprehensive examination generally covers academic preparation and basic principles and applications in addition to any design or analysis project report. A final exam can be taken no sooner than two semesters after approval of a student's plan of study and project proposal.

### *Ph.D. Degrees*

After submission of the dissertation and the completion of all other prescribed work for the degree, but in no case earlier than six months before the conferring of the degree, the candidate will be given a final examination, oral or written or both, by the supervisory committee meeting on campus. The examination will cover the dissertation research, and it may also cover academic subjects and basic principles and application of the principles to the dissertation subject. A final exam can be taken no sooner than two semesters after passing the qualifying exam.

## **Foreign Language Requirements**

There is no foreign language requirement for any degree; however due to the international nature of Agricultural and Biological Engineering the students are encouraged to take advantage of the language courses offered at the University of Florida.

## **Administrative Policies**

### *Policy on Graduate Student Support*

Regardless of whether a graduate student is supported with state or grant funds, the purpose of these policies is to encourage timely progress toward completion of degree requirements and to make optimal use of available funding and other resources (space, faculty time, equipment, etc...). It is expected that graduate students' assistantships will be supported with grant and/or state funds. State funds may be used to support international students when the student's expertise and background are needed to further our research programs.

Since recruitment of outstanding domestic graduate students is very competitive, state support will be given on a first-come first-serve basis, as soon as an outstanding student has been identified. The Graduate Coordinator will review requests for state money assistance for new graduate students and will make recommendations to the Department Chair who will make the final decisions.

### *Length of Support*

Graduate students on financial support (grant or state funds) may receive support for up to 2 years at the master's level and up to 4 years at the Ph.D. level. Information specific to each student is contained in the student's Letter of Offer. Continuation beyond these periods for exceptional cases will be subject to review on a case by case basis.

The faculty advisor will make the request for continuation with state funds at least a semester before the student is scheduled to be off financial support. Requests for continuation should be made as early as possible because of the need for planning to make adjustments for the budget year. If continuation of the assistantship is with grant funds, the grant P.I. will make the decision, with the approval of the Department Chair.

In all cases, a Funding Extension Form detailing the source of the funding must be completed prior to each additional semester and submitted to the Coordinator of Academic Support Services for review by the Department Chair. ***Students who do not receive an approved funding extension are to be considered self-funded for the duration of their program unless additional funding becomes available.***

### *Assistantship Responsibilities*

Assistantship requirements normally include thesis or dissertation activities but can include other tasks assigned by the faculty advisor or Graduate Committee.

All students who entered the ABE graduate program in Fall 2011 and beyond, must participate in the Department's teaching and/or extension education programs by developing new lecture, online resource, distance education and laboratory material for courses or by conducting lectures or laboratories. Masters students must include a minimum of one hour of ABE 6940 Supervised Teaching in their Plans of Study and PhD students must include at least three hours of ABE 6940 Supervised Teaching in their Plans of Study. Up to 5 hours of credit for ABE 6940 Supervised Teaching can be included in PhD Plans of Study. A score of 55 on a UF SPEAK test (<http://ase.ufl.edu/testing.html>) or a score of 28 on the Speaking portion of a TOEFL iBT test is required of all graduate students whose native language is not English before they can lecture in courses. UF permits provisional teaching assignments for students scoring 45 or 50 on a UF SPEAK test or 23 - 27 on the Speaking portion of the TOEFLiBT if they concurrently enroll in EAP 5836 Academic Spoken English 2 (<http://ase.ufl.edu/syllabi2.html>).

In order to remain on assistantship a student must be registered for the appropriate number of credit hours each term ([see Table 1](#)).

### *Semester Evaluation*

Each graduate assistant will be evaluated by his/her faculty advisor based upon performance of assigned duties; compliance with department requirements such as maintenance of office hours, regular visits with faculty advisor, academic progress; and meeting the requirements of the supervisory committee, department, college, and graduate school relating to the timely execution of required documents such as plan of study, supervisory committee appointment form, etc.

### *Vacation and Sick Leave*

- A. Vacation and sick leave is a departmental courtesy benefit and not a University benefit.
- B. Vacation leave may be taken by the graduate assistant with the approval of his/her advisor.
- C. Please note that all graduate assistants, regardless of percent employment or actual hours worked, are expected to be on duty at least part of every working day not taken as vacation or sick leave, including the period between academic terms. Official state holidays are not considered to be working days.

## *Office Assignments*

Office space is assigned to graduate students on a space-available, priority basis. Office assignments are made by the department Coordinator of Academic Support Services. Most office space is in conventional offices shared by multiple graduate students, and some desks are in laboratories. Priority of office space is generally given in the following order, however this does not imply selection of location is based on the same priority. The Graduate Coordinator or Coordinator of Academic Support Services may adjust actual locations to best meet the needs of all students and the needs of the department.

- A. Full-time graduate research assistants
- B. Ph.D. graduate assistants with assistantships
- C. Other Ph.D. students
- D. Masters students as space allows

If desk assignments are not available for Masters students, a shared office space will be made available. Permanent storage of personal items is not permitted in the shared space and desks are not assigned. Lockers are available for use by Master's students and may be obtained from the Coordinator of Academic Support Services.

Room keys will be assigned to graduate students by the Research Program Coordinator. The Research Program Coordinator will enter the student's Gator 1 ID information into the building's security system, so that the student's Gator 1 ID will unlock entrance doors to Frazier Rogers Hall. Keys will unlock graduate student office doors and laboratory doors. Graduate students who have need for access to the shop will be assigned a key with these additional capabilities.

Graduate students must turn in any keys assigned to them upon completion of their graduate program. **Keys are not to be loaned to non-departmental personnel. It is unlawful to duplicate these keys.** Entrance doors automatically lock between 5:00 P.M. and 7:30 A.M. and on weekends and holidays.

## *Research involving Data Collection using Human or Animal Subjects*

If your research involves data collection using animals or humans, you must be familiar with the University of Florida procedures that ensure that the rights and welfare of the animals and people are adequately monitored and protected. All research projects involving human or animal subjects, even if it is purely observational, must be approved before the project begins by one of three boards outside of the department. Federal regulations prohibit retroactive approval and any research results obtained without approval cannot be used.

Before you begin any such research, it is critical that you obtain approval from the appropriate UF committee: the Institutional Review Boards or the Institutional Animal Care and Use Committee. Information regarding these committees is found in the UF Graduate Student Handbook.

## *Research Data, Software, Designs and Manuscripts*

All research data, patents, designs, computer software, creations, etc. obtained by graduate students on assistantship support are the property of the State of Florida. All research data and other requested materials must be submitted to the advisor before the student leaves the University of Florida. If any patents or copyrights are awarded to the inventions or designs of any graduate student's thesis or dissertation research, then both the student and his/ her advisor are credited. They can receive a percentage of the profits or royalties realized from the patents or copyrights.

Graduate students are strongly encouraged to submit manuscripts for publication of their findings. The advisor and others involved directly with the research project are to be listed as co-authors. It is recognized that graduate students may leave the University without preparing a manuscript to submit for publication and may or may not do so within a reasonable time. Twelve months after the student leaves the University, the advisor can use the thesis and research data to prepare a manuscript for publication if the student has not already done so. Under this arrangement, the advisor would be the senior author and the former student would be a co-author.

## *Computer Time and Assistance*

All student offices, classrooms and laboratories have internet access. Upon arrival at the department, students should submit an Application for ABE Network Account (Appendix G) to the department's Systems Programmer who will set up the account ID and initial password.

The departmental computer teaching lab is available to all students at times when classes are not scheduled for the lab. Students working on class assignments in this lab are given priority over students working on research assignments.

### *Purchases and Support*

Requests for staff support should be channeled through the student's advisor. Services are restricted to work in support of research activities with the approval of the advisor. Under no circumstances will these services be available for activities related to course work or thesis or dissertation preparation. Expenses related to the preparation of required reports or publications based on theses and dissertations are legitimate departmental expenses.

All purchases made for extension, research and teaching activities, whether related to thesis research or not, must receive prior approval of the student's advisor. Details for making purchases are available from the departmental fiscal office.

### *Use of State Vehicles*

State vehicles are for **OFFICIAL USE ONLY**. Operators of state vehicles must abide by all state laws as specified in "Rules of the Road" available from any Florida Highway Patrol Office. Special courtesy to other drivers should be exercised at all times, since one is representing the department, university, and state when driving a state vehicle.

A valid Florida driver's license is required to operate state vehicles. As required by the State of Florida, a commercial driver's license may be required for operation of certain vehicles. Caution: Only persons employed by the university are covered by state insurance while operating a university-owned vehicle. A graduate student on an assistantship meets the employment criterion.

Students operating state vehicles should check with their advisors and the Research Program Coordinator concerning current procedures for signing out vehicles, purchase of fuel, maintenance of vehicle log book, etc.

### *Use of Shop Facilities and Services*

Graduate students are generally expected to fabricate experimental equipment needed for their thesis or dissertation research that is not otherwise available. Students must follow all policies and regulations regarding the use of shop facilities. The policies and rules are:

- A. These shops are intended only for research, teaching and extension activities.
- B. The precision machine shop can only be accessible to persons obtaining permission from the Research Program Coordinator.
- C. During the Monday through Friday work week the general shop is accessible to faculty, graduate students, and staff from 8 A.M. to 5 P.M. During the Monday through Friday work week the teaching shop is available to faculty, graduate students, and staff if their activities do not interfere with classroom instruction.
- E. To insure safety, all persons using the shop facilities must work only when another person is within the same laboratory area during its use. In cases of extensive or complex fabrication, shop personnel may help with the work. Use of shop personnel must be arranged by the student's advisor in advance. Graduate students should not use general shop supplies (steel, plastic, pipe, etc.) without prior approval of the Research Program Coordinator and faculty advisor.

### *Laboratory Safety Procedures*

Graduate students are generally required to perform chemical or biological experimental research to obtain data for their thesis or dissertation.

Before beginning work in any Agricultural and Biological Engineering (ABE) laboratory students are required to:

1. Read and understand all Safety and/or Biological manuals and attend required Safety, Biological and Hazardous Waste training.
2. Submit a Standard Operating Procedures (SOP) for each procedure to the Lab Manager or PI prior to beginning any experiments.
3. Wear Personal Protective Equipment (PPE) (ANSI approved goggles, long pants, closed toed shoes-required in all laboratories, appropriate gloves, and laboratory coats,.)

4. Label all liquids in glassware with proper names. Avoid using chemical abbreviations. Labels should include the name of the user and the date.
5. No eating or drinking is permitted in the laboratory. The break room should be used for eating and drinking.
6. To insure safety, never begin an experiment alone in the laboratory, and never work without the *Principal Investigator* and Lab Manager's knowledge. In addition, when you are working in the laboratory outside of your regular lab time, you must inform your PI and/or other lab members.

## APPENDIX B

*Note: Required articulation courses do not count toward the credit hours of coursework required for a graduate program of study. Students may have to pay for articulation courses out-of-pocket as they may not be included in assistantship funding.*

### *Equivalency Requirements for Agricultural Operations Management*

	Semester Credits
Biological Sciences	7
CHM2045 and Lab	4
Applied Physics	3
Survey of Calculus	3
Basic Economics Course	4
Management/Production Management Courses	9
Agricultural Operations Management Courses	9
Technical Agriculture Courses	6-9

### *Equivalency Requirements for Applied Science Degree*

	Semester Credits
Biological Sciences	7
Analytical Geometry and Calculus I and II	8
Differential Equations	3
General Physics I and II (including labs)	8
General Chemistry I and II (including labs)	8

# APPENDIX C

## *Lists of Courses for Mathematics Requirement and for Applied Statistics Requirement*

### **Math Courses:**

	Semester Credits
ABE 6933 Data Diagnostics	3
ABE 6986 Applied Mathematics in Agricultural Engineering	3
ECH 6847: Mathematical Basis of Chemical Engineering	3
EGM 5121C: Data Measurement and Analysis	3
EGM 6321 Principles of Engineering Analysis I	3
EGM 6322 Principles of Engineering Analysis II	3
EGM 6323 Principles of Engineering Analysis III	3
EGM 6341 Numerical Methods of Engineering Analysis I	3
EGM 6342 Numerical Methods of Engineering Analysis II	3
EGM 6351 Finite Element Methods	3
EGM 6352 Advanced Finite Element Methods	3
MAA 5104 Advanced Calculus for Engineers and Physical Scientists I	3
MAA 5105 Advanced Calculus for Engineers and Physical Scientists II	3
MAA 5404 Introduction to Complex Variables for Engineers and Physical Scientists	3
MAA 6236 Mathematical Analysis for Statisticians	3
MAD 6406 Numerical Linear Algebra	3
MAD 6407 Numerical Analysis	3
MAP 5304 Intermediate Differential Equations for Engineers and Physical Scientists	3
MAP 5345 Introduction to Partial Differential Equations	3
MAP 6217 Intro to Calculus of Variations for Engineers and Physical Scientists	3
MAP 6375 Numerical Partial Differential Equations	3
MAP 6376 Finite Element Method	3
MAP 6505 Mathematical Methods of Physics and Engineering	3
MAP 6506 Mathematical Methods of Physics and Engineering II	3
MAS 5157 Vector Analysis	3
MAS 5311 Introductory Algebra I	3
MAS 5312 Introductory Algebra II	3
STA 5325 Fundamentals of Probability	3
STA 5328 Fundamentals of Statistical Theory	3
STA 5701 Applied Multivariate Methods	3
STA 5823 Stochastic Process Methods	3
STA 6207 Regression Analysis	3
STA 6208 Design and Analysis of Experiments	3
STA 6226 Sampling Theory and Applications	3
STA 6326 Introduction to Theoretical Statistics I	3
STA 6327 Introduction to Theoretical Statistics II	3

***The Applied Science Ph.D. require 3 credits minimum from the above list. Substitutions may be accepted only with prior approval by the department graduate committee***

# Applied Statistics Courses:

Semester Credits

STA 6166 Statistical Methods in Research I  
or ALS5932 Introduction to Applied Statistics for Ag and Life Sciences 3

*Note: Only one of ALS 5932 or STA 6166 (but not both) may be applied towards any program of study (since they cover essentially the same material). If one's program requires STA 6167, the student is encouraged to take STA 6166 (which is the official prerequisite) or obtain advance permission from the STA 6167 instructor to enroll in STA 6167 without STA 6166.*

STA 6166 Statistical Methods in Research I (or ALS5932) 3  
STA 6167 Statistical Methods in Research II 3

A compilation of UF Statistics courses can be found at [https://ufstatscourses.shinyapps.io/shiny\\_tutorial/](https://ufstatscourses.shinyapps.io/shiny_tutorial/)

***The Applied Science MS degree require 3 credits minimum from Appendix C. Substitutions may be accepted only with prior approval by the department graduate committee***

## APPENDIX D

### *Example Quantitative Course List for Applied Science MS/Ph.D. Degrees*

	Semester Credits
ABE5038 Advanced Fundamentals & Applications of Biosensors	3
ABE5152 Electro-Hydraulic Circuits/Controls	3
ABE 5332 Advanced Agricultural Structures	3
ABE 5442 Advanced Bioprocess Engineering	3
ABE 5643C Biological and Agricultural Systems Analysis	3
ABE 5646 Biological and Agricultural Systems Simulation	3
ABE 5653 Rheology and Mechanics of Agricultural and Biological Materials	3
ABE 5663 Environmental Biotechnology	3
ABE 5707C Agricultural Waste Management	3
ABE 5815C Food and Bioprocess Engineering Design	4
ABE 6005 Applied Control Automation	3
ABE 6031 Instrumentation in Agricultural Engineering Research	3
ABE 6035 GIS in Hydrology	3
ABE 6037C Remote Sensing in Hydrology	3
ABE 6252 Advanced Soil and Water Management Engineering	3
ABE 6254 Simulation of Agricultural Watershed Systems	3
ABE 6262C Remote Sensing in Hydrology	3
ABE 6265 Vadose Zone Modeling	3
ABE 6266 Nanotechnology in Water Research	3
ABE 6615 Advanced Heat and Mass Transfer in Biological Systems	3
AOM 5431 GIS and Remote Sensing in Agriculture and Natural Resources	3
CWR 5125 Groundwater Flow I	3
CWR 6115 Surface Hydrology	3
CWR 6525 Groundwater Flow II	3
CWR 6536 Stochastic Subsurface Hydrology	3
CWR 6537 Contaminant Subsurface Hydrology	3
SOS 6622 Vadose Zone Hydrology	3
STA 6166 Statistical Methods in Research I	4
STA 6167 Statistical Methods in Research II	4
STA 6200 Fundamentals of Research Design	2
STA 6201 Analysis of Research Data	3
STA 6207 Applied Statistical Methods	3
STA 6208 Regression Analysis	3
STA 6209 Design and Analysis of Experiments	3

## APPENDIX E

### *Summary of Procedures for Master of Science Degree*

It is the student's responsibility to ascertain that all requirements have been met and that every deadline is observed.

<http://graduateschool.ufl.edu/graduation/checklists>

<u>Requirement</u>	<u>Person Responsible</u>	<u>Completion Date</u>
Select Advisor and Members of Supervisory Committee	Student	Middle of First Term
Request Transfer of Credit from other Undergraduate, Postbaccalaureate, or Graduate Programs	Faculty Advisor Student	End of first term. Email to Academic Services Coordinator.
Submit signed Supervisory Committee form to Academic Services Coordinator.	Faculty Advisor Student	Beginning of second term
Submit approved Plan of Study to Academic Services Coordinator.	Faculty Advisor Student	End of second term
Submit approved Research Project Proposal to Academic Services Coordinator.	Faculty Advisor Student	End of second term
Obtain a copy of Deadline Dates from Graduate School website.	Student	Term prior to one in which degree is to be awarded
Notify Academic Services Coordinator of Intended Graduation Date	Student	Two weeks before last day of classes in term <b>preceding</b> the term in which the degree is to be awarded
Submit Petitions regarding Degree Requirements	Academic Services Coordinator	4:00 PM of last day of classes in term <b>preceding</b> the term in which the degree is to be awarded
Final Term Registration	Student	3-Credit Minimum (ABE 6971), (2-Credit during Summer)
Present Seminar on Thesis Research or Nonthesis Project	Student	During Last Term
Apply for graduation on ISIS	Student	Prior to published deadline in Deadline Dates
Notify Academic Services Coordinator of Final Exam date, time, place & thesis title.	Faculty Advisor Student	Not later than 10 working days before examination
Final Examination	Faculty Advisor	Prior to published deadline in Deadline Dates. Submit Final Examination Report Forms to Academic Services Coordinator.
Pay Library Processing Fee	Student	Prior to thesis submission to Graduate School
Submit thesis to Graduate School Editorial.	Student	Prior to published deadline in Deadline Dates
Return office key, desk key and all equipment to Research Program Coordinator	Student	Prior to departure

## APPENDIX F

### *Summary of Procedures for Ph.D. Degree*

It is the student's responsibility to ascertain that all requirements have been met and that every deadline is observed.

<http://graduateschool.ufl.edu/graduation/checklists>

<u>Requirement</u>	<u>Person Responsible</u>	<u>Completion Date</u>
Select Advisor and Members of Supervisory Committee	Student	Middle of First Term
Request Transfer of Credit from other Undergraduate, Postbaccalaureate, or Graduate Programs	Faculty Advisor Student	End of first term. Email to Academic Services Coordinator.
Submit signed Supervisory Committee form to Academic Services Coordinator.	Faculty Advisor Student	Beginning of second term
Submit approved Plan of Study to Academic Services Coordinator.	Faculty Advisor Student	End of second term
Submit approved Research Project Proposal to Academic Services Coordinator.	Faculty Advisor Student	End of second term
Written and Oral Qualifying Examinations	Faculty Advisor	Normally taken after completion of at least two terms of Ph.D. study. There must be a minimum of two terms between the successful completion of the exam and the graduation date.
Submit Admission to Candidacy Form	Faculty Advisor	Submit to the Academic. Services Coordinator. upon satisfactory completion of entire Qualifying Exam
Registration in doctoral research	Student	Register in ABE 7979 before admission to candidacy. Register in ABE 7980 after admission to candidacy.
Obtain copy of Deadline Dates and have record checked at Student Records Office, 288 Grinter Hall	Student	Term prior to one in which degree is to be awarded
Notify Academic Services Coordinator of intended graduation date	Student	Two weeks before last day of classes in term <b>preceding</b> the term in which the degree is to be awarded
Petitions regarding degree requirements.	Academic Services Coordinator	4:00 PM of last day of classes in term <b>preceding</b> the term in which the degree is to be awarded
Final term registration	Student	3-Credit minimum (ABE 7980), (2-Credit during Summer)
Present seminar on Dissertation Research	Student	During last term
Apply for graduation on ISIS	Student	Prior to published deadline in Deadline

Dates

First submission of dissertation and related forms to Graduate School Editorial Office	Student	Prior to published deadline in Deadline Dates
Notify Academic Services Coordinator of Final Exam date, time, place & dissertation title.	Faculty Advisor Student	Not later than 10 working days before examination.
Final Examination	Faculty Advisor	Prior to published deadline in Deadline Dates. Submit Final Examination Forms to Academic Services Coordinator.
Pay Library Processing Fee and Publication Fee	Student	Prior to dissertation submission to Graduate School
Submit Dissertation to Grad School Editorial Office	Student	Student Prior to published deadline in Deadline Dates
Return departmental key, desk key and all equipment to Graduate Program Assistant	Student	Prior to departure

# APPENDIX I

## *Graduation Checklist*

- \_\_\_ E-mail the Academic Support Services Coordinator (ASSC) the semester prior to graduation to do a requirements check.
- \_\_\_ Present seminar to department (You should have completed ABE6931). The seminar can be part of a final defense.
- \_\_\_ Have all grade changes for incomplete grades submitted. **DO NOT DELAY THIS!**
- \_\_\_ **IMPORTANT...**if you made changes to any coursework for a concurrent degree you must resubmit a corrected, signed program of study to the graduate school.
- \_\_\_ If you are getting a minor you must send the ASSC the list of courses for the minor to be submitted to the graduate school.
- \_\_\_ Confirm on your transcript that courses did transfer from a former Master's program if you including them in your PhD program of study.
- \_\_\_ The graduate school requires 12 hours of dept. coursework in the major for a Master's program (15 for non-thesis). I may have to petition to have non-ABE/AOM/PKG courses counted, so let me know a full semester before you graduate so I can review your transcript/POS and petition if necessary.
- \_\_\_ Schedule a conference room for your defense. They book up early so don't wait.

**Semester of graduation:**

- \_\_\_ **Register for required number of research hours (DO NOT FORGET THIS RULE!).**  
                   3 hours in Fall or Spring      2 hours in Summer

- \_\_\_ Register for required number of total hours if you are on an assistantship or Fellowship  
 Spring/Fall=9 assistantship/12 Fellowship      Summer=6 assistantship/8 Fellowship

- |  |  |
|--|--|
| ___ Apply for graduation   | On ISIS  |
| ___ Reserve regalia for ceremony   | Registrar's website – graduation checklist                                   |
| ___ Guide for Preparing Theses & Dissertation<br>( <a href="https://gradschool.ufl.edu/editorial/introduction.html">https://gradschool.ufl.edu/editorial/introduction.html</a> ) | ETD - Grad School Editorial Site   |
| ___ Deadline dates list<br>( <a href="http://gradcatalog.ufl.edu/content.php?catoid=4&amp;navoid=893">http://gradcatalog.ufl.edu/content.php?catoid=4&amp;navoid=893</a> )       | Grad school website  |
| ___ Schedule defense date  | Give to ASSC with date, time, place & title 10 working days prior to defense |
| ___ Final exam form- <b>MS non-thesis</b>  | Request form for Sup. Committee to sign. Return to ASSC.                     |
| ___ Exit Interview with Dr. Haman  | Schedule with executive assistant  |
| ___ Forwarding address   | Provide to ASSC  |
| ___ Turn in desk, office key   | To Paul Lane, prior to graduation  |