

GRADUATE STUDENT HANDBOOK

Biological Systems Engineering



COLLEGE OF ENGINEERING
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
BIOLOGICAL SYSTEMS
ENGINEERING
VIRGINIA TECH.™

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MEET THE BSE GRADUATE PROGRAM ADMINISTRATION



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I. GUIDELINES FOR GRADUATE EDUCATION

Two sets of guidelines are provided for graduate study in the Biological Systems Engineering Department:

1. The Graduate School has general guidelines, which are found in the document [Expectations for Graduate Education](#).
2. The Department of Biological Systems Engineering guidelines, which are outlined in this Handbook.

II. OVERVIEW OF GRADUATE DEGREE PROGRAMS

Department of Biological Systems Engineering Mission Statement

The overall educational mission of the BSE graduate program is to graduate biological systems engineers to support sustainable production, processing, and utilization of biological materials and to protect natural resources.

The BSE M.S. program seeks to prepare its graduates to become successful in the practice of biological systems engineering or in the pursuit of Ph.D. degrees in BSE or other complementary disciplines.

The BSE Ph.D. program seeks to prepare its graduates to become successful educators, researchers and practitioners of biological systems engineering or other complementary disciplines.

Upon completion of the graduate program, students will be able to:

- demonstrate technical competence in chosen area of study

- demonstrate effective communication skills
- demonstrate ability to synthesize prior literature on a research topic
- demonstrate ability to contribute to scholarly research (does not apply to non-thesis Masters Degrees)
- understand the broader technical implications of their work
- understand the broader societal implications of their work

Overview of Graduate Degree Programs

The Department offers programs leading to Master of Engineering (M.Eng.), Master of Science (M.S.) or Doctor of Philosophy (Ph.D.) degrees in Biological Systems Engineering.

III. GRADUATE PROGRAM POLICIES AND PROCEDURES

The following policies and procedures have been established to guide the planning, development, operation, and completion of graduate programs in the Biological Systems Engineering Department. These policies and procedures have been developed for use by both graduate students and their advisors (major professors and advisory committee members).

Graduate students are expected to review these policies and procedures very carefully, and meet with their major professor to discuss them and seek clarification, if needed. The Graduate Program Director and/or the Department Head can also clarify policies and procedures. The graduate student and the major professor are responsible for meeting all the requirements. In addition to these policies and procedures, all BSE graduate students are expected to follow the [Graduate School Policies](#).

III.1. ETHICS AND RESEARCH INTEGRITY TRAINING

Since ethics is an important value for BSE students to know and uphold in their engineering practice the Commission on Graduate Studies and Policies Resolution 2012-13B mandates that “the Program of Study for all graduate students show a record of the student’s participation in the particular ethics and integrity activities delineated by the student’s program, department, or college, as part of the student’s graduation requirements.” This requirement came into effect for students matriculating in Fall 2014.

All graduate students are required to participate in ethics and integrity activities and diversity training as part of their graduate studies.

The ethics and integrity requirement consist of three components which include, BSE Orientation, BSE Seminar and an online training component. Typically, these requirements will be met during the first BSE Seminar required for new students in their first fall semester.

III.2. DIVERSITY TRAINING

Virginia Tech is preparing its graduate students to recognize and address issues around diversity and inclusion that are ingrained in every aspect of our society. The Inclusion and Diversity requirement, emphasizes the guiding values of the institution and takes an active stance in training students to be allies and advocates in their respective disciplines. All graduate students must pass ENGE 5304: Graduate Student Success in Multicultural Environments in their first semester to fulfill the Graduate School’s diversity training requirement.

III.3. ENROLLMENT

Full-time students on BSE assistantships are required to enroll for 15 credit hours each semester. Domestic students with no assistantship should enroll a minimum of 9 credits to become eligible for a full-time student status. Due to visa regulations, international students are required to register for a minimum of 12 credits to maintain full time student status.

In situations where course credits total is less than the above minimum enrollment, the student must register for either BSE 5994 Research and Thesis (for master's students) or BSE 7994 Research and Dissertation (for doctoral students) and increase the number of credit hours in order to meet the minimum enrollment.

New students are expected to meet with their major professor before the beginning of classes to tentatively outline the courses to be taken during their degree program.

III.4. REGISTRATION

Registration for classes can be completed until the deadline specified on the University Calendar. Pre-registration, which takes place the preceding semester, is done by selecting the courses to be taken through the Hokie Spa portal. It is important to pre-register. If you are on an assistantship and your tuition is being paid for you, failing to pre-register could cause you to be assessed a late fee. In addition, the Department often cancels under-enrolled courses based upon pre-registration statistics. Also, pre-registration ensures continuity of access to resources, such as wireless internet and the student health center.

III.5. PROBATION DUE TO UNSATISFACTORY GRADES

Students whose cumulative GPA falls below a "B" (3.00 GPA) will be placed on probation by the Graduate School. Enrollment for one semester of probation normally is permitted to remedy an unsatisfactory GPA. If the student does not achieve a 3.0 GPA within one semester after being placed on probation, the Graduate School will consult with the department about dismissal of the student from Graduate School. A department can appeal to the Graduate School for additional time for the student to achieve a 3.0 GPA, providing the student is making reasonable progress in raising the GPA. If an appeal is made to the Graduate School for additional time it should come from the departmental Graduate Program Director or the Department Head. If extra time is granted, the student should be informed in writing of the amount of additional time allowed for achieving a 3.0 GPA. If the department does not support a time extension, the student will be dismissed from the Graduate School.

III.6. GRADUATE ASSISTANTSHIPS

Graduate students with assistantships are employees of the Department. Thus, a graduate student must fully understand their dual role; that of a student and that of an employee. Graduate students are expected to be both good students and good employees. They will be evaluated for their performance in both roles. The assistantship is provided to the student for work to be performed. It is not provided as a scholarship to go to school or to write a thesis.

Students funded by full-time Graduate Assistantships, whether GA, GTA, or GRA, are expected to work an average of 20 hours/week. The graduate student will be assigned a work supervisor (who may or may not be their major professor). Graduate students are expected to conduct and complete their work assignments in a professional manner. At the start of each semester, the graduate student should establish work hours with the work supervisor, and the students should be at their work station during this mutually agreed upon time. The student should realize that there will be differences in work assignments among graduate students. While efforts are made to avoid gross inequalities in job assignments, strict equality is not practical.

Academic Eligibility to Hold a Graduate Assistantship - Assistantships may be offered to degree seeking graduate students admitted to Regular (GPA of 3.00 or greater) or Provisional (GPA of 2.75-2.99) status.

Continuing an Assistantship - The continuance or renewal of an assistantship is contingent on satisfactory academic progress, satisfactory performance of GTA or GRA duties, and professional and personal conduct of an exemplary nature. At the end of each calendar year all students are required to file an annual progress report. This report will be used as the basis for evaluation of student's progress.

The Graduate School's requirement to continue to be eligible for an assistantship a student must maintain a GPA of 3.00 or higher and be making satisfactory progress toward attainment of a graduate degree. The academic department and the Graduate School may allow a student to continue on an assistantship for one semester of probationary status to remedy grade deficiencies.

The BSE Department expects M.S. and Ph.D. students to maintain a minimum GPA of 3.2 and 3.4 respectively, in order to hold an assistantship. If a student does not meet the minimum GPA they will be required to meet with their advisor and the BSE Department Head.

Personal Leave - Graduate students are on the same holiday schedule as the faculty in the Department of Biological Systems Engineering. If a student would like to request a holiday or personal leave outside of the university holiday schedule, they should consult with their work supervisor and major advisor in advance.

Vacations - Graduate students on teaching and research assistantships do not accumulate annual leave time for vacations. All graduate students must arrange vacation time with their work supervisor and/or major professor.

Sick Leave - Graduate students on teaching and research assistantships do not accumulate leave time for sickness. When the student is sick, both the work supervisor and major professor must be informed.

III.7. PROFESSIONAL ATTITUDE

A major objective of the graduate research and teaching in the Biological Systems Engineering program is to prepare students for their future professional careers. As in many professional careers, tasks are project-oriented; rather than tracking hours. Students should be self-motivated and hold themselves accountable for completing tasks. In the BSE department, graduate students are treated as

fellow professionals whose ideas, concepts, and approaches are an integral part of the projects in which they participate.

III.8. SAFETY PROCEDURES

The [University Health and Safety Policy](#) is intended to help prevent accidents, illnesses and injuries; increase safety awareness; meet requirements of environmental, occupational health, and safety laws and regulations; reduce institutional liability; and establish safety responsibilities for members of the university community and visitors to university-owned property, including state-owned property associated with Virginia Tech.

Before using any laboratory facilities, students must become familiar with the safety procedures that apply to the area, through the laboratory manager. Only after an orientation on safety procedures by the laboratory manager, will permission be granted to use a specific laboratory facility. All accidents are to be reported to the laboratory manager and the student's Major Professor as well as the faculty member responsible for the designated area.

Student responsibilities include:

- Compliance with all university health and safety programs,
- Attendance at a mandatory safety orientation provided by the laboratory manager. and,
- Informing the laboratory manager, and supervisor of any safety hazards in the classroom, laboratory or other workplace areas.

III.9. REQUIREMENTS FOR STUDENTS WITHOUT A PRIOR ENGINEERING DEGREE

A student without a prior engineering degree is required to take the following two courses at either undergraduate or graduate level: Fluid Mechanics and Thermodynamics. The student needs to obtain a passing grade (P on a P/F scale, or C- (or better) on a letter scale). If undergraduate level courses are to be taken, the course credits cannot be counted towards the student's Plan of Study. These courses can be taken anywhere that is convenient to the student prior to or after joining the BSE graduate program. For MS students, the courses must be taken before the final MS defense exam.

IV. DEPARTMENTAL SUPPORT AND PRIVILEGES

Secretarial support and the use of the copy machine, printer, and other departmental supplies are not provided to students for completion of theses, dissertations, or for personal use. These services, however, are available for students in accomplishing teaching and research responsibilities assigned in the department. The student is responsible for all expenses involving preparation of the thesis or dissertation.

Office Space - Office space with appropriate furniture is available to graduate students while pursuing degree requirements. The Graduate Program Coordinator assigns office space. If students want to move to a different office space, they should first get the approval from the Graduate Program Coordinator.

Keys - Keys are issued by the faculty/staff member responsible for key distribution and must be returned prior to departure from the University. A key form must be completed, signed by advisor and submitted to the appropriate staff person.

Phones - Phones for student use are located in 214 Seitz Hall (231-6509). Toll calls may not be made from any phone in the department unless permission is granted by the major professor.

Photocopier - The photocopier in the department can be used for your teaching related activities and to a limited extent, for sponsored research related activities. For large amounts of copying, you should contact your major professor and make arrangement to use the Printing Services in Smyth Hall.

Supplies - All supplies ordered must have prior approval from the Major Professor. For items ordered from any other department, an ISR form (Interdepartmental Service Request) must be filled out and supplied when the materials are obtained. A copy must be given to the fiscal technician (Teresa Smith). The Major Professor should be consulted on current procedures for ordering supplies and equipment for your research. When ordered supplies are received, the packing slip is to be checked to ensure the materials ordered are included in the shipment; the packing slip should then be signed, dated, and given on the same day to (Teresa Smith).

IV.1. PROFESSIONAL TRAVEL

Graduate students may travel on official business and be reimbursed for their travel expenses. A [VT Travel Estimate and Approval Form](#) must be completed and filed for approval at least two weeks prior to the departure date. All business travel by graduate students must be approved in advance by the student's work supervisor/major professor and the department head. Copies of Travel Authorization forms can be obtained by contacting the BSE Department's financial analyst.

IV.2. UNIVERSITY VEHICLES – FLEET SERVICES

University vehicles are available for long distance trips for research related activities. Requests for use of University vehicles from [Fleet Services](#) require permission of the student's Major Professor. For all business trips a [VT Travel Estimate and Approval Form](#) must be filled out prior to the trip. University vehicles are not for personal use. A fleet services FS-2 form must be signed by the student and kept on file with the department prior to use of a Fleet Services vehicle. A signed form and valid driver's license must be presented to Env/Agri Research Manager (Laura Lehmann, 111 Seitz Hall).

IV.3. DEPARTMENT VEHICLES

The Department has trucks which can be checked out for research and fieldwork. These trucks are for project use by graduate students and undergraduates only if employed by the department. Faculty must approve all students (graduate and undergraduate) in person or by email to the service center manager (Laura Lehmann, lauteany@vt.edu) before students are allowed to sign an FS-2 form for use. A fleet services FS-2 form must be signed by the student and kept on file with the department prior to use of a Fleet Services vehicle. A signed form and valid driver's license must be presented to Laura Lehmann (111 Seitz Hall).

Truck Check-out and Reservations

Keys are available in the Ecological Engineering Laboratory, 113 Seitz Hall. Faculty must approve all students (graduate and undergraduate) in person or by email to the service center manager (Laura Lehmann, lauteany@vt.edu) before students are allowed to sign an FS-2 form. A signed form and valid driver's license must be presented to Laura Lehmann (111 Seitz Hall).

Faculty need to provide student operators or the service center manager with a valid fund number to which their mileage will be charged. A Departmental charge account number is to be indicated on the vehicle checkout sheet at the time it is signed out. Department Truck checkout sheets are located in 113 Seitz Hall. Students must provide name, purpose for use, fund number, beginning and ending mileage and the location the truck was parked in when it was returned on the checkout sheet. Trucks may be reserved ahead of a scheduled trip by contacting Laura Lehmann (lauteany@vt.edu, 540-231-6094) to determine availability.

Department Truck Parking

Our Department trucks are state vehicles and are considered service vehicles. As such, they can be parked in any service (S) space on campus. If no service spaces are available, they can be parked in faculty/staff (F/S) spaces or commuter/grad (C/G) spaces. Department trucks CAN NOT be parked in handicap or carpool spaces. Additionally, the service spaces directly behind Seitz Hall underneath the walkway are for TWO vehicles only. Vehicles are only allowed to park in the striped area of the parallel space. Parking a third vehicle in the line next to the F/S spaces behind the building is off limits. This is to allow for proper view for vehicles leaving the parking area between Seitz and Smyth. If you park a vehicle in the non-striped space you may be ticketed. The last person to use the vehicle and park it there will be responsible for the ticket. If you have any questions regarding the use of departmental vehicles, please contact Laura Lehmann (111 Seitz).

In Case of an Accident

If you are involved in an accident while using a department truck you must contact the police and the department as soon as possible. Contact Laura Lehmann at 540-231-6094 to report any accidents to the department. Insurance information and a copy of the vehicle registration are located in the orange packet in the glove box of the truck. The orange packet has a blue form which must be filled out by the police officer on the scene and returned to the department as soon as possible. Further instructions for reporting the accident are outlined on the orange packet.

IV.4. EQUIPMENT RETURN

Each student should return building keys to Teresa Smith (Seitz 202)

V. DEGREE DETAILS

MASTER OF ENGINEERING (M.ENG.)

Provisional Admission

Provisional Admission to a graduate degree is open to an applicant whose GPA is below 3.00 required by the Graduate School, but generally not lower than 2.75, who has other experience or qualifications that demonstrate potential to undertake graduate study and whose admission is requested by the admitting academic unit. After attempting 12 graduate credits and earning at least a 3.00 GPA, a student is changed to Regular status by the Graduate School. If a 3.00 GPA is not earned in the first 12 credit hours attempted, the Graduate School will consult with the academic unit to determine whether the student should be allowed to continue for one additional semester on probationary status.

Major Professor and Advisory Committee

Each M.Eng. student must have an Advisory Committee. This committee must be formed before the plan of study is filed. Some graduate students may be assigned an interim, while others are recruited to work with a specific faculty member, who will serve as the major professor. A permanent major professor should be selected prior to forming the Advisory Committee. The student's major professor serves as the chair of the student's Advisory Committee. The Advisory Committee will consist of three faculty members (including the advisor). Each Advisory Committee should include at least one external (Non-BSE) faculty member.

Plan of Study

Prior to completion of the second semester, the student should submit a copy of the program of study, signed by all Advisory Committee members, and a brief, one page, project prospectus (PDF) to the Graduate Program Coordinator. Upon approval by the Graduate Committee and the Department Head, the Graduate Program Coordinator will electronically submit the program of study to the Graduate School. Additional requirements include the following:

- A minimum of 6 credit hours of courses in Biological Systems Engineering Department approved for graduate credit;
- A minimum of 6 credit hours of Math and/or Statistics (or approved equivalents); and
- A minimum of 24 credit hours of course work; and
- A minimum of 30 total credit hours (which includes the 24 course credits plus an appropriate amount of BSE-5904 Project and Report credits for a total of 30)

Progress Reports

Frequent progress reports, either oral or written, must be made by the student to their Advisory Committee. The frequency of the reporting and the manner of presentation will be determined by the student's major professor. However, a Graduate Student Annual Report, required by the Graduate School, should be submitted to the Graduate Program Coordinator in January for any student who has completed at least one semester at Virginia Tech.

Graduate Seminar

Graduate students are expected to register for the first fall BSE departmental seminar course (BSE 5944) and attend all regular and special departmental seminars unless approved by the major professor or faculty member in charge of seminar.

Project Report

Graduate students at the M.Eng. level are required to present a project report at the time of their final examination.

MASTER OF SCIENCE (M.S.)

Provisional Admission

Provisional Admission to a graduate degree is open to an applicant whose GPA is below 3.00 required by the Graduate School, but generally not lower than 2.75, who has other experience or qualifications that demonstrate potential to undertake graduate study and whose admission is requested by the admitting academic unit. After attempting 12 graduate credits and earning at least a 3.00 GPA, a student is changed to Regular status by the Graduate School. If a 3.00 GPA is not earned in the first 12 credit hours attempted, the Graduate School will consult with the academic unit to determine whether the student should be allowed to continue for one additional semester on probationary status.

Major Professor and Advisory Committee

Each M.S. student must have an Advisory Committee. This committee must be formed before the plan of study is filed. Some graduate students may be assigned an interim, while others are recruited to work with a specific faculty member, who will serve as the major professor. A permanent major professor should be selected prior to forming the Advisory Committee. The student's major professor serves as the chair of the student's Advisory Committee. The Advisory Committee will consist of three faculty members (including the advisor). Each Advisory Committee should include at least one external (Non-BSE) faculty member

Plan of Study

Prior to completion of the second semester, the plan of study should include a listing of all courses, giving name and credit hours, using the appropriate form, depending on type of M.S. program. The student should submit a copy of the program of study, signed by all Advisory Committee members, and a brief, one page, [research prospectus](#) to the Graduate Program Coordinator. Upon approval by the Graduate Program Director and the Department Head, the Graduate Program Coordinator will electronically submit the plan of study to the Graduate School. Additional requirements include the following:

A minimum of 6 credit hours of courses in Biological Systems Engineering Department approved for graduate credit;

- A minimum of 9 credit hours of Math and/or Statistics (or approved equivalents); and
- A minimum of 21 credit hours of course work; and
- A minimum of 30 total credit hours (which includes the 24 course credits plus an appropriate amount of BSE-5994 Research and Thesis credits for a total of 30)

For students who participated in the accelerated BS/Master's program graduate credits taken as an undergraduate may be used for graduate credit only if the course was designated on the Accelerated Undergraduate/Graduate Status and Course Designation Form.

Thesis Proposal

Each M.S. degree candidate is required to submit a written proposal to the student's Advisory Committee stating the significance, goal, and general approach to be taken to accomplish the stated objectives. The thesis proposal should be submitted no later than 9 months after the beginning of the M.S. Program. The student's major professor will then call a meeting of the student's Advisory Committee to discuss the proposal. Upon approval of the proposal, any significant variations must have the approval of the student's Advisory Committee.

Progress Reports

Frequent progress reports, either oral or written, must be made by the student to their Advisory Committee. The frequency of the reporting and the manner of presentation will be determined by the student's major professor. However, a Graduate Student Annual Report, required by the Graduate School, should be submitted to the Graduate Program Director in January.

Graduate Seminar

Graduate students are expected to register for the first fall BSE departmental seminar course (BSE 5944) and attend all regular and special departmental seminars unless approved by the major professor or faculty member in charge of seminar.

Research Seminar

Graduate students at the M.S. level are required to present a seminar at the time of their final examination.

Technical Publication

Each graduate student should prepare an article based on his/her thesis research for an appropriate technical journal and, after approval by the major professor, submit it for publication.

Final Exam

Each M.S. candidate is required to pass an oral final exam administered by the student's Examining Committee, normally composed of members of the student's Advisory Committee with additional members added, if necessary. This examination will cover not only the thesis, but the student's general preparation in Biological Systems Engineering as well. A typed draft copy of the student's thesis, approved by the major professor, must be submitted to the Examining Committee members at least two weeks prior to the examination. In addition, each member of the Examining Committee should be furnished with a copy of the student's approved plan of study. Normally, the candidate will be asked to make a short presentation to the Examining Committee highlighting important aspects of the research. The first half of the examination will be devoted to examining the thesis. The second half of the examination will be more general in nature, and will draw from the student's background, including course work.

On the basis of the candidate's performance during the examination and the quality of thesis, the Examining Committee will determine whether the student has passed or failed:

- A majority vote of the Examining Committee is required to pass. The Committee may, however, require thesis revisions and/or inform the candidate of areas of weakness revealed by the examination.
- If the student is not successful, the Examining Committee will point out deficiencies and recommend a possible date for the second examination.
- Any student failing the final examination twice will be subject to dismissal from the program.

DOCTOR OF PHILOSOPHY (PHD)

Provisional Admission

Provisional Admission to a graduate degree is open to an applicant whose GPA is below 3.00 required by the Graduate School, but generally not lower than 2.75, who has other experience or qualifications that demonstrate potential to undertake graduate study and whose admission is requested by the

admitting academic unit. After attempting 12 graduate credits and earning at least a 3.00 GPA, a student is changed to Regular status by the Graduate School. If a 3.00 GPA is not earned in the first 12 credit hours attempted, the Graduate School will consult with the academic unit to determine whether the student should be allowed to continue for one additional semester on probationary status.

Advisory Committee

All Ph.D. students must have an Advisory Committee. This committee must be formed before the plan of study is filed. The major Professor normally serves as chair of the Advisory Committee. The Advisory Committee will consist of minimum of four faculty members (including the advisor). At least two members of the committee must be from the BSE Department, and at least one must be from outside the BSE Department.

Plan of Study

Each Ph.D. student's plan of study must be submitted prior to completion of the third semester. The plan of study should include a listing of all courses, giving name and credit hours, using the appropriate form, depending on type of Ph.D. program. The student should submit a copy of the program of study, signed by all Advisory Committee members, and a brief, one page, research prospectus (PDF) to the Graduate Program Coordinator. Upon approval by the Graduate Program Director and the Department Head, the Graduate Program Coordinator will electronically submit the program of study to the Graduate School.

Doctoral degree programs must include, in addition to the Graduate School requirements:

- A minimum of 9 credit hours of Biological Systems Engineering approved for graduate credit;
- A minimum of 9 credit hours from Mathematics and/ Statistics equivalents); and
- A minimum 30 credit hours of coursework (these totals may include acceptable graduate courses from master's degree programs or other graduate studies, completed either at Virginia Tech or other universities up to a maximum of 50%); and
- A minimum of 90 total credit hours (which includes the 30 course credits plus an appropriate amount of BSE-7994 Research and Dissertation credits for a total of 90).

Doctoral students must satisfactorily complete both written and oral preliminary examinations. The preliminary examination should be taken no later than 18 months from the date of initiation of the Ph.D. program, in order to continue graduate assistantship support without interruption. The planned date (semester and year) for the examinations must be submitted with the program of study.

All Ph.D. students are encouraged to take a college teaching courses (such as courses within the Graduate School's Future Professoriate Graduate Certificate program) as part of their program of study

Preliminary Examination

The Preliminary Examination should normally be taken near the end of the Ph.D. course work and no later than 18 months after the beginning of the Ph.D. program. Students admitted to the Direct Ph.D. program should take the Preliminary Examination no later than 2 years after the beginning of their Program. The purpose of this examination is two-fold: 1) to test the student's mastery of doctoral course work, and b) to evaluate the student's ability to initiate ideas and pursue scholarly research. The examination is administered by the student's Examining Committee and should have both oral and written components. The Examining Committee may include members of the student's Advisory Committee and others, if necessary. At least one-third of the required credits (including research credits) must be taken after passing the preliminary examination. The procedure for the examination is as follows:

1. Upon the request of the major professor, written questions are prepared by the Examining Committee members and made available to the student about one month in advance of the oral examination. Individual committee members may choose the format to administer their portion of the written examination (the exam may be open book or closed book; in class with specified time limits; or out of class without time limits.) The nature of the written questions is up to the individual committee members. However, they are normally related to the student's course work or general area of their studies. Upon completion of the written examination, the student will return the answers to the major professor who will then submit them to the committee members at least one week prior to the oral examination.
2. Request to schedule a preliminary examination must be made through the Graduate School's [Exam Scheduling System](#).

Dissertation Proposal

Within 18 months after the start of the program, each Ph.D. student must present a written research proposal of the dissertation topic to the Advisory Committee for its approval. The student's major professor will then call a meeting of the Advisory Committee where the student will make an oral presentation of the proposal and discuss it with the committee.

The purpose of the written and oral presentation of the research proposal is to determine the feasibility and originality of the proposed research, and to offer suggestions to the student regarding the proposed research. Significant variations to the dissertation proposal must have the approval of the Advisory Committee.

Progress Report

Frequent progress reports, either oral or written, must be made by the student to their Advisory Committee. The frequency of the reporting and the manner of presentation will be determined by the student's major professor. However, a Graduate Student Annual Report, required by the Graduate School, should be submitted to Graduate Program Director in January.

The students are advised to keep all Advisory Committee members well informed of their research and dissertation progress. This could be accomplished by meeting with the Advisory Committee members on a regular basis. The review of progress should be carried out at least once every six months after the dissertation proposal has been presented.

Graduate Seminar

Graduate students are expected to register for the first fall BSE departmental seminar course (BSE 5944) and attend all regular and special departmental seminars unless approved by the major professor or faculty member in charge of seminar. Doctoral students are also required to register for one spring seminar course (BSE 5944).

Research Seminar

Doctoral students will present two seminars. The first seminar should be scheduled during the semester in which the oral preliminary examination is taken, and the second seminar at the time of the final examination

Technical Publication

Each graduate should prepare at least one article, based on his/her research work, and after approval by the major professor, submit the article to peer refereed publications. Publications accepted and appeared in print before graduation will enhance the success of completing the program.

Final Exam

Each Ph.D. candidate is required to pass an oral final examination administered by the student's Examining Committee. It is the responsibility of the student to allow all members of their Ph.D. Examining Committee sufficient time to closely evaluate the Ph.D. dissertation and judge the creativity and adequacy of the research work. Copies of the final typed draft of the dissertation must be made available to all members of the Examining Committee at least two weeks prior to the date of the defense.

The final Ph.D. oral examination is primarily devoted to the defense of the dissertation, and the evaluation will be based on the following criteria:

- Originality of content
- Significance of the problem studied
- Methods of analysis
- Achievement of the research objectives
- Interpretation and discussion of results
- Clarity of presentation and adherence to the format requirements

At the final defense, the Ph.D. candidate generally makes a 30-minute presentation, unless specified otherwise by their major professor.

Request to schedule final examination must be made through the [Graduate School Exam Scheduling System](#). Requests must be made no less than two weeks prior to the examination date. The exam card will be sent directly to the major professor. The student is expected to return the card to the Graduate Program Coordinator within 24 hours with appropriate signatures.

Students who fail the final oral examination will be required to correct deficiencies in the dissertation as indicated by the Examining Committee. Any student failing the final oral Ph.D. examination twice will be subject to dismissal from the program.