

Graduate Student Handbook Biological and Ecological Engineering Department



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1 Purpose of this Document

Education is not filling of a pail but lighting a fire
-John Dwayne

This handbook provides an overview of departmental policies in graduate education. It provides graduate students and advisers information on departmental policies regarding course requirements, general regulations and conflict resolution. This document details requirements specific to the Biological & Ecological Engineering Department.

2 Mission of the Department

Our mission is to achieve national and international recognition for integrated research and education in the programs broadly defined as Ecological Engineering, Biological Engineering, and Water Resources Engineering, with strong links to the agricultural and natural resources communities. Our constituencies will include environmental and ecological consulting firms, ecotechnology providers, entrepreneurial enterprises building new 21st-century biology- and ecology-based industries, public resource management agencies, and stakeholders in the state with interests in the focus areas outlined below. We accomplish our research and educational mission through a combination of undergraduate and graduate education, scholarly research, extension education, and public outreach.

Biological & Ecological Engineering (BEE) offers programs leading to the Master of Science and Doctor of Philosophy degrees. The BEE graduate program serves at the interface of engineering and life sciences. It is the application of problem solving techniques derived from engineering and life science principles to optimize the use and sustainability of resources. The curriculum is engineering-based with strong emphases in the life sciences and water resources. Courses focus on biological systems modeling, bioprocess engineering, bioenergy and bioproducts, bioremediation, regional hydrologic analysis, groundwater systems, irrigation, and water resource optimization.

Department email address: info-bee@enr.orst.edu

World Wide Web info: <http://bee.oregonstate.edu>

3 Research Focus

The department concentrates its research efforts on three major thrust areas: water resource engineering, ecological engineering and biological engineering.

Water resource engineering activities address questions related to: optimum water and energy use; agricultural water management; water allocation and storage; global climate change; modeling large-scale hydrologic systems; soil-water-atmosphere-plant system relationships; erosion control and soil drainage.

Our Ecological Engineering program examines topics such as watershed management, river ecohydrology, dynamics of coupled human/natural systems, and alternative landscape futures modeling.

Our researchers in the biological engineering program examine the use of bio-based processes and technologies for biofuels and high-value bioproduct development. Specific research topics in biological engineering include biohydrogen production, bacterial biofilm development, bioconversion processes, biomolecular separations, microscale fermentations, biofuels, downstream processing of biological products, and modeling of biological systems.

4 Admission Requirements

4.1 General Requirements for All Applicants

Most prospective graduate students have an undergraduate or graduate degree of recognized standing in a field related to biological and/or ecological engineering. A student's committee may require the student to take appropriate undergraduate courses to make up deficiencies in the undergraduate program. A list of required 'Undergraduate Fundamentals' is part of the Checklist for Biological and Ecological Engineering Programs of Study and is included in this handbook. Credit received in undergraduate courses taken to overcome deficiencies may not be used as credit towards meeting the requirements for a graduate degree.

To allow a complete evaluation of the student's ability to succeed, it is the policy of this department that all prospective graduate students must submit GRE scores before being accepted. There is no minimum score

requirement. Applications must also include a copy of the graduate school application, copies of transcripts, personal statement of objectives, and three letters of reference. Ph.D. applicants should also provide a list of publications and research experiences.

4.2 U.S. Citizens and Permanent Residents

- A four-year baccalaureate degree from an accredited college or university for MS applicants.
- Masters degree with thesis (i.e. a non-terminal masters degree) from an accredited college or university for PhD Applicants.
- A combined GPA of 3.00 on the last 90 credit hours of graded undergraduate work plus all work completed thereafter.

4.3 International Applicants

- Equivalent of an American baccalaureate degree with a B average GPA for MS applicants.
- Equivalent of an American masters degree with a B average GPA for PhD applicants.
- English language proficiency (TOEFL minimum score of 550 on the written test and 213 for the computer-based test). TOEFL scores must be no more than two years old at the time of registration.
- Sufficient financial resources.

5 Appointment Guidelines

5.1 Provisional Admission

The first requirement to admission is that a member of the faculty agrees to serve as major professor. Next, admissions must be approved by the Chair of the Graduate Committee or the Department Head.

5.2 Conditional Admission

Students with a degree from a non-accredited institution or students who do not meet the minimum GPA requirement may be considered for conditional admission. To stay enrolled these students must satisfactorily complete specified requirements in order to demonstrate their ability to carry out graduate-level work. Note that more information regarding these rules may be found in the Graduate Catalog.

Students admitted to the university on a conditional basis are not eligible for an assistantship until they have accomplished regular admission status. Students on an assistantship are still responsible for paying all student fees each term.

Conditional admission of international students presenting TOEFL scores of at least 500 may be granted. This would require

- On-campus English language instruction prior to enrollment.
- Compliance with the subsequently specified plan for English and academic course work during each quarter until that student qualifies for regular admission status by achieving a TOEFL score of 550.

6 Financial Support

6.1 Graduate Research Assistantships

Graduate research assistants may be appointed on an academic-year (9 month) basis or a full-year (12 month) basis. No appointment can be for less than 0.20 FTE ('full-time equivalence') or more than 0.49 FTE. All graduate research assistants are required to provide service to OSU to justify their stipends. Graduate assistants on a 0.49 FTE appointment are expected to provide an average of 20 hours of service per week. *This service may be in addition to the time required to complete their thesis research.* Graduate research assistants at other FTE levels would provide proportional levels of service.

Department policy strongly recommends that a graduate research assistant should be enrolled for no less than sixteen credit hours in any term in which he or she is supported. Thesis credits can be used to satisfy enrollment requirements for these students. A minimum of twelve credit

hours per term and maintaining a GPA of 3.00 or better is required for continued financial support.

6.2 Graduate Teaching Assistantships

The department does not currently offer graduate teaching assistantships.

6.3 Scholarships and Awards

The department recognizes excellence in various student activities through a number of scholarships. These scholarships are in addition to university wide scholarships. A list of current departmental scholarships can be found at <http://bee.oregonstate.edu/programs/scholarships>

7 Policies and Requirements

The information in the following pages is taken, in part, from the Oregon State University Graduate Catalog. Additional information can be obtained by requesting a copy of the current Graduate Catalog from the Office of Admissions or the Graduate School.

Graduate students in the Department of Biological & Ecological Engineering are responsible for complying with the rules of the University, the Graduate School and the Department. In instances where the requirements of the Department are more stringent than those of the Graduate School, the departmental requirements specified will apply.

8 Role and Duties of Major Professor and Student

Having an open and honest relationship between the major professor and the student is central to the success of a graduate experience. The student should feel free to discuss successes and problems, mistakes, or disappointments. Throughout research and coursework, there are bound to be instances where things go wrong and this is to be expected. The sooner a problem is discussed, the sooner it can be resolved.

8.1 Duties of the major professor

- To guide the student in choosing a graduate program committee.
- To guide the student in developing a program of study.
- To ensure that thesis committee meets regularly and functions effectively.
- To supervise the student's research work, thesis, thesis research publication, and professional development.
- To provide basic computing resources for the student with access to printing and web access.
- To advise student in thesis preparation to meet university and departmental guidelines.
- To review and approve student's thesis before presenting it to other members of graduate committee.
- After completion of all requirements, approve students application for graduation.

8.2 Duties of the student

- It is the responsibility of the student to see that all deadlines and requirements are met.
- Select members for graduate program committee in consultation with major professor.
- Create a checklist for graduation requirements and deadlines (Please refer to Appendix A and B).
- Fulfill graduate program committee/advisor requirements.
- Fulfill Departmental requirements (see Appendix A).
- Fulfill University Graduate level requirements.

- Register for courses well in advance after formulating a program of study developed in consultation with major professor and graduate program committee.
- Perform research with integrity and due diligence.
- Collect appropriate data, perform data analysis and write a complete thesis with all necessary sections such as literature review, methods, results, discussion, conclusion, future work and engineering relevance.
- It is strongly recommended that full-time graduate students, who are not Graduate Research Assistants, register for 16 credits per term, including thesis research.
- Student must arrange regular meetings with major professor and graduate program committee.

9 Academic Requirements

A summary of academic requirements is given on the Checklist for BEE Programs of Study and is included in Appendix A. The M.S. and Ph.D. academic requirements described below are general requirements. Any exceptions must be approved by the BEE Graduate Committee and Department head. Students are advised to bring any potential exceptions to the notice of major professor and BEE Graduate Committee at the earliest.

9.1 M. S. Degree Specific Requirements

Master's degree programs require a minimum of 45 graduate credit hours including thesis (6 to 12 credits), or a project-in-lieu-of-thesis (3 to 6 credits). Exceptions to this capstone requirement are specified under the degree descriptions that follow these universal master's degree requirements.

Effective fall 2005, all graduate student programs of study submitted to the Graduate School must consist of, at least, 50% graduate stand-alone courses. The remaining credits may be the 500 component of 400/500 slash courses. General regulations for all master's programs can be found at <http://catalog.oregonstate.edu/Default.aspx?section=Graduate>

The residence requirement for the Master's degree is 30 credit hours on the OSU campus after admission as a graduate student. These 30 credits must appear on the Master's degree program of study.

All work toward a M.S. degree, including transferred credits, course work, thesis (if required), and all examinations, must be completed within five years. Credit hours used in one Master's program may not be used in an additional Master's program.

The final oral examination will be conducted by an examining committee which will consist of at least four graduate faculty members: two in the major field, one in the minor field, and (except for the non-thesis option) a Graduate Council representative.

Departmental requirements for the M. S. degree include the following course areas:

- Nine (9) credits of graduate level pure or applied biological sciences selected from the College of Agricultural Sciences and/or Science. The student's committee may allow some of these credits to be in natural resource sciences other than biology and would then prepare a letter to the Graduate Committee describing the rationale for that particular program.
- Nine (9) credits of graduate level engineering courses (in addition to BEE 529) which include significant components of engineering science and/or design, selected from the College of Engineering.
- Modeling Skills: BEE 529 (Biosystems Modeling Techniques).
- Departmental Seminars: Each student must take three department seminars (*BEE 507: Graduate Student Orientation, Graduate Research and Publication, and Oral Presentation Skills*) that are intended to develop their understanding of the profession and to develop presentation skills. Additional requirements may be set by the student's major or minor professor, by the department, or by the student's advisory committee as needed to strengthen his or her background.

9.1.1 Non-Thesis option

The non-thesis option or project-in-lieu-of-thesis, is intended for those students seeking a 'terminal' degree (student does not plan to continue

towards an advanced degree). Selection of this option requires the approval of the student's major professor. The total credit requirements are the same, but a project, which must include a minimum of 6 project credits (BEE 506), will be undertaken in lieu of a research thesis. At completion of the degree a written project report is submitted to the advisor and the department. Additionally, a public presentation of the project must take place before graduation.

9.2 Ph.D. Degree Specific Requirements

The equivalent of at least three years of full-time graduate work beyond the bachelor's degree is required. University guidelines suggest a minimum of 108 graduate credits, including 30-45 credits of Ph.D. thesis; M.S. thesis credits cannot be included. There is no rigid total credit requirement except for the university guidelines.

The student's doctoral study program is formulated and approved subject to departmental policies at a formal meeting of his or her doctoral committee. The committee consists of a minimum of five members of the graduate faculty, including two from the major department and a representative of the Graduate Council.

A minimum of one full-time academic year (at least 36 credits) should be devoted to preparation of the thesis. Gaining the ability to critically evaluate societal impacts and ethical issues associated with research in biological and/or ecological resource engineering is an important component of the Ph.D. program. *Toward this end, Ph.D. candidates are required to include in their dissertations a comprehensive treatment of the potential societal impact of their research.* This treatment would constitute an independent section (chapter) of the dissertation.

Departmental requirements for the Ph.D. degree include the following course areas:

- Twelve (12) credits of graduate level pure or applied biological sciences selected from the College of Agricultural Sciences and/or Science. The student's committee may allow some of these credits to be in natural resource sciences other than biology and would then prepare a letter to the Graduate Committee describing the rationale for that particular program.

- Twelve (12) credits of graduate level engineering courses (in addition to BEE 529) which include significant components of engineering science and/or design, selected from the College of Engineering.
- Modeling Skills: BEE 529 (Biosystems Modeling Techniques).
- Departmental Seminars: Each student must take three department seminars (*BEE 507: Graduate Student Orientation, Graduate Research and Publication, and Oral Presentation Skills*) that are intended to develop their understanding of the profession and to develop presentation skills. Additional requirements may be set by the student's major or minor professor, by the department, or by the student's advisory committee as needed to strengthen his or her background.
- One (1) credit of additional seminar that focuses on professional topic areas and/or presentation skills (in addition to the 3 credits of BEE Departmental seminars).

9.3 Graduate Minor

A graduate minor is an academic area that clearly supports the major. On a M.S. or Ph.D. program, a minor may be:

- An academic area available only as a minor
- the same major with a different area of concentration
- an approved major at another institution in the Oregon University System
- an integrated minor

Note: An integrated minor consists of a series of cognate courses from two or more areas. These courses must be outside the major area of concentration, with most of the courses being outside the major department. The graduate faculty member representing the integrated minor must be from outside the major department. Graduate minors are listed on the student's transcript.

If a minor is declared, approximately two-thirds of the work must be in the major field and one-third in the minor field. The student's advisory committee must include a member from the minor department.

9.4 Dual Major

For the M.S. or Ph.D. degree, a student may pursue two graduate major areas instead of the traditional single major. Only one degree is awarded, and the student must basically satisfy all degree requirements for majors in both areas.

10 Thesis/Dissertation

10.1 Research

Each graduate student's research project is the centerpiece of his or her graduate educational experience. *At least 15 hours per week should be spent on the research project from the first day a student enters the graduate program, whether on an assistantship or not, regardless of course load.* The research project must be composed of original work that addresses an area of contemporary concern to science or engineering. As such, the results should be obtained using conceptually sound methods, and with sufficient precision to be suitable for publication in the peer reviewed journals.

M.S. students should have completed a research proposal by the end of their second term at OSU and Ph.D. students should complete research proposals by the end of their first year in the program. "The development of a research proposal is intended to help the student focus on developing a problem statement and hypotheses, and to focus on concrete details of the proposed methodology. The latter is important to accomplish prior to fieldwork and the process of writing can help identify potential methodological problems at an early stage. Proposal writing can also help identify writing problems – too often these are left unaddressed until the thesis. Lastly, the proposal document helps the committee understand the scope of work and provides a structure on which they can comment and provide guidance. The format of the proposal is intended to be flexible and under the direction of the student's major advisor".

Graduate students must file a study program with the Graduate School before completing 18 hours of graduate credit. This is the responsibility of the student. *A student who does not file a program within the specified deadline will not be allowed to register for the next term.* A study program is developed under the guidance of the major and minor professors and is signed by the Department Head before filing in the Graduate School.

Changes in the program may be made by submitting a *Petition for Change Form*.

10.2 Preparation

Every thesis must be written in grammatically correct English and should be thoroughly checked for errors in math or transcription of data. Although this is fundamentally the responsibility of the student, the major professor will support this effort.

Detailed guidelines for preparation of the thesis are presented in

Preparing a Thesis or Dissertation at OSU

which can be found on the OSU website. Students should check with the Graduate School before the final thesis draft is prepared to ensure that the format meets current standards.

OSU policy states that all matters related to thesis preparation and costs are the responsibility of the student. Services required, such as clerical help, duplication, etc., must be arranged for outside the Department. In some instances the thesis research relates to a sponsored project; so the thesis may form a necessary part of the required project reports. In those cases, and with approval of the major professor, the cost of preparation of the thesis can be supported in part by the research grant.

OSU requires that final copies of each thesis be submitted to the university and to the department. When the final library copies of the thesis are submitted to the Graduate School, students are required to follow the guidelines listed in the Survival Guide posted on the web at oregonstate.edu/dept/grad_school/docs/student-success-guide.pdf.

Doctoral students entering their degree programs fall of 2000 or after are also required to submit an electronic copy in .pdf format. One bound copy is to be delivered to the department. In order to avoid loss of this copy, it will not be allowed to leave the office. It is requested that the student provide the department with a PDF and an unbound copy of the thesis. This will provide a check-out copy for faculty or students who might need access to the information in the future. In addition, one copy should be supplied to the major professor. The student is advised to retain a personal copy.

11 Examinations

11.1 Ph.D. preliminary exams

The purpose of the preliminary exam is to ensure the student's readiness to advance to candidacy. He/she must demonstrate knowledge of major and minor fields, and the ability to plan and conduct Ph.D. level research. It is a university requirement that students must be enrolled for a minimum of 3 credits in any term in which they undertake written or oral preliminary exams.

1. Program of Study Approval: The first step is to have the program of study approved by the student's program committee. As part of that process, the members of the committee review and sign the student's Program Check List.

Written preliminary exams (called 'written comprehensive examination' in the OSU catalog) and oral preliminary exams are given after coursework is largely completed and early enough in the research program that the committee is able to influence its direction.

2. Written Comprehensive Exam: This is required by the Department. The exact format for each student will be a decision of that student's program committee. Some example options would include:
 - Development of one research proposal.
 - Response to a series of questions prepared by the program committee (3-7 days is provided to the student to develop the response).
 - A proposal describing the student's thesis research.

The written exam is reviewed by the student's entire committee which will then confer and decide if the student has performed adequately to move on to the oral preliminary exam. The student then schedules the oral exam with the committee and the Graduate School at least one week prior to the exam date.

3. Oral Preliminary Exam: This is required by the University and must be scheduled with the Graduate School at least one week in advance of the date. The student should schedule the oral exam to allow a

duration of 3 hours; the 'target' as stated in the OSU catalog is to be 'at least 2 hours'. At least one week prior to the exam, the student distributes to the committee an outline describing his/her proposed research. Typically the student is expected to deliver a short (15-20 minute) presentation of proposed research. Questions at the oral exam can cover coursework, the proposed area of research and/or the written exam results. No more than half the exam period should be devoted to specific aspects of the research proposal. More general questions can cover any societal impact of research or background coursework described on the student's Program Checklist.

- (a) **Pass:** Upon approval of the graduate committee with the possibility of up to one dissenting vote, student is declared as having passed and can progress into the next step of the program towards completion of dissertation research.
- (b) **Fail with an opportunity to retake exam only once:** Should the student fail the first oral exam, a second exam may be given, but no sooner than one month after the original exam.
- (c) **Fail without an opportunity to retake exam:** The student will be terminated from the graduate program.
- (d) **Adjourn for a period not less than 1 term:** During this period, student must address areas of significant concern and complete the specific tasks that graduate committee suggests.

11.2 M.S. and Ph.D. final oral exam

Final oral exams may be taken only after all other requirements for the degree have been satisfied. Final oral exams must be scheduled at least one week prior to thesis/dissertation deposit deadline. These exams will be a minimum of two hours in duration, the first part of which is devoted to presentation (open to public) and discussion of the thesis/dissertation (closed door). These exams will be advertised to the department at least one week prior to the scheduled date. Students and faculty of the department and university are invited and encouraged to attend the first portion of any M.S. or Ph.D. final oral exam; thus an effort should be made to schedule the exam on the hour, to minimize conflicts with classes.

Complete thesis/dissertation draft must be submitted to the committee at least a week before the final oral exam. Thesis option master's and doctoral students will be required to submit only the pretext pages of their thesis to the Graduate School for editing, instead of the entire thesis draft. For a listing of pretext pages, see the online Thesis Guide at <http://gradschool.oregonstate.edu/success/thesis-guide>. There are four possible outcomes of the final oral exam:

1. **Pass:** Upon approval of the graduate committee with the possibility of up to one dissenting vote, student is declared pass and will be recommended for degree, subject to final approval from major professor and Department.
2. **Fail with an opportunity to retake exam only once:** Should the student fail the first oral exam, a second exam may be given, but no sooner than one month after the original exam.
3. **Fail without an opportunity to retake exam:** The student will be terminated from the graduate program.
4. **Adjourn for a period not less than 1 term:** During this period, student must address areas of significant concern and complete the specific tasks that graduate committee suggests.

12 Course Loads, Grades and Time Limits

Any student who receives less than a 3.00 GPA for two consecutive terms, or who cannot maintain a 3.00 GPA after three terms, will be notified that he/she is no longer considered a candidate for a graduate degree in the Biological & Ecological Engineering Department.

Unsatisfactory performance of duties, failing an oral exam, academic dishonesty or other violations of the Student Conduct Regulations may all serve as grounds for dismissal from the Department and/or Graduate School.

Students admitted to MS program must complete all requirements of the program within **five** years under normal circumstances. Students in PhD program must complete all requirements within **seven** years from the date of joining the program. Students who have obtained a masters degree elsewhere must complete the requirements for PhD in **six** years.

13 Satisfactory Student Progress Criteria

Continuous satisfactory performance in academics and research is essential for success in graduate school. Biological & Ecological Engineering Department continuously strives towards excellence in academics and research. As a part of that effort graduate students in Biological & Ecological Engineering Department will be continually assessed in two major areas.

1. Academic criteria

Students must enroll for a minimum of 12 credits although department strongly recommends enrollment in 16 credits. Students must maintain a minimum 3.00 GPA in all quarters. Students must meet minimum enrollment requirements to be eligible for financial aid/assistantship. Any student who receives less than a 3.00 GPA for two consecutive terms, or who cannot maintain a 3.00 GPA after three terms, will be notified that he/she is no longer considered a candidate for a graduate degree in the Biological & Ecological Engineering.

Student, in consultation with their major professor and thesis committee should prepare a graduate program of study before completing 18 credits.

2. Research criteria

Each graduate student's research project is the centerpiece of his or her graduate educational experience. At least 15 hours per week should be spent on the research project from the first day a student enters the graduate program, whether on an assistantship or not, regardless of course load. The research project must be composed of original work that addresses an area of contemporary concern to science or engineering. As such, the results should be obtained using conceptually sound methods, and with sufficient precision to be suitable for publication in peer reviewed journals.

Development of a research proposal is intended to help the student focus on developing a problem statement and hypotheses, and to focus on concrete details of the proposed methodology. All MS students should complete a research proposal by the end of their second term. All PhD students must complete a research proposal by end of their first year. The format for the research proposal will be decided by the

student's major advisor and committee. All proposals must include a timetable for thesis research. A copy of the proposal signed by the graduate committee will be kept with student's major professor.

Monitoring student progress

At the beginning of every quarter, all graduate students in the Department must submit a 1-2 page summary and research objectives for that quarter to the student's major professor. Major professor is expected to assess research progress. Continued poor performance may serve as grounds for termination of assistantship/dismissal from the graduate program at the Department and/or Graduate school. Guidelines for the graduate student progress are listed in Appendix B.

14 Professional Responsibilities and Academic Conduct

Graduate students enrolled at OSU are expected to conform to basic regulations and policies developed to govern the behavior of students as members of the University community. Violations of honesty are unacceptable in course work, lab notes, and oral or written reports. Any work that is not that of the student must be fully referenced as to its origins. Any writing that is directly quoted must be indicated with quotation marks. Assignments that are carried out with other students should be noted as such. Values written in lab books and reports must be factual, having been taken directly from an instrument, or a summary of instrument readings. Any data that is omitted must be documented as such, i.e., partial data sets must be identified.

14.1 Publication of Research

Scientific research is at the heart of the graduate education. Evaluation of research by peer review process, publishing in peer reviewed journals and dissemination of research findings through publications, proceedings is central to scientific research. Such published research enhances the standing of the graduate students, faculty, department and university. Therefore, all graduate students, especially those on assistantships are expected to publish their research findings in peer reviewed journals. Graduate students

are expected to complete publication-ready drafts of papers before they leave the university.

14.2 Significant Teaching Experience

In today's competitive world, communication skills are very important for student success in academia, industry, government agencies and NGO's. Significant teaching experience, especially for PhD students, is expected by academic employers. PhD students are expected to obtain sufficient training in communication skills. While departmental seminars will provide a basic framework to develop communication skills, students are advised to talk to their major professors about opportunities such as presenting lectures, conducting lab sessions, and other avenues to demonstrate significant teaching experience.

15 Conflict Resolution

We sincerely strive to ensure a conflict free work environment. We expect everyone from the University community to observe high standards of professional conduct. We recognize that sometimes some problems may arise. Department strongly encourages that any grievances be informally addressed by having an open, honest discussion with the faculty or staff with whom the problem has arisen. Additionally, the major professor or Department Head may try to resolve the issue and arrive at a mutually acceptable solution. If the grievance is not addressed informally, a formal process under university guidelines may be initiated by the Department Head.

16 General Regulations Concerning Facilities

16.1 ID Cards, Keys and Office Space

All Oregon State University students are eligible to receive an I.D. card that allows access to various campus services and activities. Detailed

information about these cards and how to acquire one can be found in the Schedule of Classes.

Keys to access labs will be based on individual needs. The Department office will provide necessary forms after obtaining approval from the major professor. Keys can be obtained from the key shop located on campus. Keys are the property of OSU and are the students responsibility. Keys must not be shared/replicated under any circumstances. Please report any lost keys immediately. Office space will be provided for graduate students enrolled in the department. Space for graduate students who are advised by our faculty but enrolled in other departments is not guaranteed due to lack of sufficient space and is available only on an application basis. No space may be occupied without permission of the Department.

16.2 Computing Support

The goal of computing support within the Biological & Ecological Engineering Department is to provide robust access to computing resources within the department and across campus. Computing resources are provided at three levels: 1) within the department, 2) at the College of Engineering, and 3) through OSU computing support. Students should visit the department's home page at <http://bee.oregonstate.edu> for updated policies regarding computer access.

All BEE students are given a computer account that is centrally administrated. It is an ENGR account, which is accessible from any computer on campus, as long as you login to the ENGINEERING domain. If you have not set up your account, you may do so by taking your student ID card to Hovland Room 108. Use your ID with the swipe card reader to access the machines, and follow the instructions to create a new account. Remember your account name and password. When you log on from any NT server on campus to the ENGINEERING domain, you will automatically have a drive mapped (Z:) to a STAK volume on a central ENGR server. This provides you with 1.2GB of space on that server. Any computer that is connected to the departmental network is required to conform to certain standards. These standards reflect needs for security, access, and ANY COMPUTER THAT DOES NOT CONFORM TO THESE STANDARDS WILL BE DISCONNECTED FROM THE NETWORK.

- You must have the BEE Network Administrator set up your machine
- You must have an ‘admin’ account on your machine. The Network Administrator can set this up.
- You must have Symantec or any other Department approved antivirus running and configured correctly. The Network Administrator can set this up.
- BEE student laptop printer setup - printer access for BEE students with laptops.

16.3 Printing, Copying and Other Services

Departmental secretarial service may not be used by graduate students for matters that are of a personal nature. This includes course work, forms, copying, thesis preparation and personal correspondence. Please note - departmental stationary, envelopes and postage are not allowed to be used for personal business.

Long-distance telephone calls charged to authorization codes assigned to faculty are paid for with department funds and are reviewed monthly. Personal long-distance telephone calls are not to be made when using these authorization codes. *Use of these authorization codes to make personal telephone calls will result in a letter of reprimand or termination from the program and the individual will be expected to pay for the phone calls.*

The copy machine in the main office is available to students for personal or project-related copying. Faculty members have been assigned access codes and any copying done on those codes will be charged to the faculty member account. This access code can be made available to students for project-related copying on a fee basis but only with the approval of the major professor. Personal copying is to be done on a personal access code (available from the office staff) and the charge is five cents per page for single-sided copies. Personal copying is not allowed when using a faculty member access code. If you need help determining whether a copy job is personal or otherwise, check with the office staff. The number of copies made on each code is recorded by the copier and reviewed monthly.

OSU security personnel are responsible for closing and locking outside doors to Gilmore Hall and the Annex around 6:00 p.m. Once security personnel secure the building, doors should remain closed and locked in

order to protect the security of the building and its contents. Propping doors open after hours allows easy access to individuals not authorized to be in the building and should not be done. Closing of windows and locking of doors in graduate student offices is an important responsibility of the graduate students housed in that office. Windows and doors in faculty offices and the main office are the responsibility of faculty and staff. Because labs are used by many people, the last person to leave a lab should close windows and lock doors. The security of personal possessions, computers and valuable research equipment depends on our willingness to assume responsibility for seeing that windows and doors are left closed and locked. All graduate students advised by department faculty are issued an After-Hours Permit. This permit will indicate to security personnel that a student is authorized to be in the building after regular working hours.

Students can be authorized to drive motor vehicles on university business. Personal vehicles can be driven and reimbursement requests for mileage can be submitted if the student is eligible and has read and signed the Private Vehicle Safety Certification form. Department or OSU vehicles can be driven if the student is eligible and has read and signed the proper forms. These forms are available on the OSU Motor pool website and must be completed before students are authorized to drive any vehicle on university business. Staff in the main office can explain the procedure used for department vehicle use.

All graduate students advised by department faculty are required to attend the SAIFer Driver Classes, when available, in order to drive motor pool or departmental vehicles. These classes are held through the Department of Environmental Health and Safety under Facilities Services on campus.

Alcoholic beverages and weapons of any kind are FORBIDDEN on campus property.

17 Graduate Faculty

17.1 Departmental Faculty

John P. Bolte, Professor and Head (541) 737-6303
boltej@engr.orst.edu
Ph.D., Auburn University
Watershed modeling, decision support, geographic information systems

Frank W. R. Chaplen, Associate Professor (541) 737-1015
chaplef@engr.orst.edu
Ph.D., University of Wisconsin-Madison
Biocatalyst characterization, bioprocess improvement through rational biocatalyst modification, cellular engineering, metabolic pathway engineering.

Richard H. Cuenca, Professor (541) 737-6307
cuenca@engr.orst.edu
Ph.D., University of California-Davis
Irrigation system optimization, water resource engineering, hydrologic system analysis.

Roger L. Ely, Associate Professor (541) 737-9409
ely@engr.orst.edu
Ph.D., Oregon State University
Environmental biotechnology, sustainable systems engineering, bioprocess engineering, modeling of biological systems.

Chad W. Higgins, Assistant Professor (541) 737-2286 higginsc@engr.orst.edu
Ph.D., The Johns Hopkins University
Environmental fluid mechanics, land atmosphere interactions

Yanzhen Fan, Assistant Professor (541) 737-9861
fanya@engr.orst.edu
Ph.D., Harbin Institute of Technology, China
Environmental Sensing.

Hong Liu, Associate Professor (541) 737-6309
liuh@engr.orst.edu
Ph.D., University of Hong Kong
Microbial fuel cells, Biological engineering.

Ganti Murthy, Assistant Professor (541) 737-6219
murthy@engr.orst.edu
Ph.D, University of Illinois, Urbana-Champaign
Renewal bioresources, bioethanol, algae biofuels, process modeling,
sustainability analysis and biological engineering.

John S. Selker, Professor (541) 737-6304
selkerj@engr.orst.edu
Ph.D., Cornell University
Groundwater quality, hydrology and modeling.

Desirée Tullos, Associate Professor (541) 737-2038
tullosd@engr.orst.edu
Ph.D., North Carolina State University
Ecohydraulics, River morphology and restoration.

17.2 External Faculty

In addition to the campus based faculty in the Department, the following Adjunct and Courtesy Faculty are Graduate Faculty of the Department of Biological and Ecological Engineering and have been approved for some or all of the following department-related duties:

- Act as a co-major advisor of M.S. and/or Ph.D. students
- Direct non-thesis option students
- Teach graduate courses in the department
- Serve on thesis committees

Dominique M. Bachelet, Associate Professor (541) 757-0687 ext. 8
bachelet@fsl.orst.edu
Ph.D., Colorado State University
Ecosystems Modeling, Global Climate Change

Michael J. Gamroth, Professor
Animal Sciences Department/OSU
Master of Agriculture, Oregon State University
Livestock facilities planning, animal waste planning, non-point source
pollution control, milking parlor design

Gordon E. Grant, Professor
Geosciences Department/OSU
Ph.D., Johns Hopkins University
Fluvial geomorphology; effects of dams and dam removal on channels;
sediment and woody debris transport; cumulative effects of human
activities on watersheds; effects of altered flow regimes

Jonathan D. Istok, Professor
Civil, Construction and Environmental Engineering/OSU
Ph.D., Oregon State University
Soil and water engineering, aquifer testing, numerical modeling of
groundwater flow, bioremediation

Stephen Lancaster, Assistant Professor
Geosciences Department/OSU
Ph.D., Massachusetts Institute of Technology
Geomorphology, hydrology, mass-movement processes, sediment dynamics,
river meandering, geomorphic evolution and analysis, numerical modeling

Danny Marks, Research Scientist
Northwest Watershed Research/ Boise, ID
Ph.D., University of California
Global climate change, large-scale spatial modeling, regional and watershed
hydrology, snow and alpine hydrology, remote sensing, digital terrain
analysis, geobase information systems

Michael T. Morrissey, Professor
Food Science and Technology/OSU
Ph.D., Oregon State University
Seafood processing, quality standards in seafood, biochemical/microbial changes in seafood

Michael H. Penner, Associate Professor
Food Science and Technology/OSU
Ph.D., California, Davis
Lignocellulosic biomass utilization, cellulolytic enzyme systems, analytical methods with lignocellulosics

18 Other Resources

In addition to the information contained in this Graduate handbook, other resources that will be useful are:

- OSU Graduate school page:
gradschool.oregonstate.edu
- BEE Dept. graduate students information repository:
bee.oregonstate.edu/resources-graduate-students
- OSU Graduate School forms repository:
gradschool.oregonstate.edu/forms
- Program of study forms:
gradschool.oregonstate.edu/forms#program
- OSU Thesis Guide:
gradschool.oregonstate.edu/success/thesis-guide
- Formatting your thesis:
oregonstate.edu/dept/grad_school/docs/thesis/Thesis%20Formatting%20Guide.pdf
- Exam schedules and thesis submission deadlines:
gradschool.oregonstate.edu/success/deadlines

- How to write a paper-Mike Ashby (an excellent article that provides valuable insight into how scientific peer reviewed publications are written):
<http://www-mech.eng.cam.ac.uk/mmd/ashby-paper-V6.pdf>
- Importance of stupidity in scientific research-Martin A. Schwartz. (on why its ok to dream that crazy dream sometimes):
<http://jcs.biologists.org/cgi/content/full/121/11/1771>

19 Acknowledgement

This graduate handbook was prepared and revised by referring to Oregon State University guidelines. Graduate handbooks from other universities and many other online sources were also consulted to incorporate best policies into our graduate program at Biological and Ecological Engineering Department.

Appendix A: Check list for Biological & Ecological Engineering programs of study

This form is to be signed by all BEE representatives of student's committee and submitted with the student's program of study. Students must have completed these credits/courses by the time they finish their degree in BEE.

Student's Name:

Degree (circle one): MS PhD

Course requirements:

Undergraduate Fundamentals	
One year, Calculus Equiv: MTH 251,252, (306 or 254)	
Applied Differential Equations Equiv: MTH 256	
One year, Calculus-based Physics Equiv: PH 211,212,213	
One year, Chemistry for engineering majors Equiv: CH 201, 202, 205, 211, 212	
Graduate Requirements	
Biosystems Modeling Techniques (BEE 529)	
Additional Graduate Engineering Credits (MS: 9 Credits; PhD: 12 Credits)	
Graduate Student Orientation (BEE 507)	
Graduate Research and Publication (BEE 507)	
Graduate Student Orientation (BEE 507)	
Oral Presentation Skills (BEE 507) (PhD students take 1 additional credit)	
Biological (or alternative) Science Courses) Credits (MS: 9 Credits; PhD: 12 Credits)	
Thesis/Project Credits	
MS Research Thesis (6 to 12)	
MS Project (3 to 6)	
PhD Research Thesis (36 or more)	
Major Advisor Date	Committee Member Date
Committee Member Date	Committee Member Date
BEE Department head Date	

Appendix B: Criteria and timelines for satisfactory student progress

Table 1: Schedule for MS students (thesis option).

Activity	Timeline
Identify major professor (You are advised to contact potential advisors prior to application/during application process)	After application and Prior to acceptance.
One/two page summary of research objectives.	Beginning of every quarter.
Identify course work and identify research area.	End of first term.
Identify potential committee members in consultation with major professor.	End of second term.
Complete research proposal and circulate among thesis committee.	End of second term.
File graduate program.	Before completion of 18 credits
Complete courses in graduate program.	Recommended by end of fifth term.
Complete thesis draft and submit to major professor.	Six weeks before oral examination.
Schedule final defense with graduate school and submit pretext pages of thesis.	One week prior to Oral examination. Only after approval of major professor.
Complete thesis draft and submit to committee. Oral Examination	One week before oral examination. End of sixth term or later. Only after approval of major professor
Submit one bound copy of thesis to major professor, department and graduate school.	After final approval by major professor.
<i>Students in MS program must complete all requirements of the program within five years of admission</i>	

Table 2: Schedule for MS students (non-thesis option).

Activity	Timeline
Identify major professor (You are advised to contact potential advisors prior to application/during application process).	After application and Prior to acceptance.
Identify course work and identify research area.	End of first term.
Identify potential committee members in consultation with major professor.	End of second term.
File graduate program.	Before completion of 18 credits.
Complete courses in graduate program.	Recommended by end of fifth term.
Complete report draft and submit to Major professor.	Four weeks before oral examination.
Schedule final oral presentation with graduate school and submit pretext pages of thesis.	One week prior to Oral examination. Only after approval of major professor.
Complete report draft and submit to committee.	One week before oral examination.
Oral Examination End of sixth term or later.	Only after approval of major professor.
Submit one bound copy of report to major professor and department.	After final approval by major professor.
<i>Students in MS program must complete all requirements of the program within five years of admission</i>	

Table 3: Schedule for PhD students.

Activity	Timeline
Identify major professor (You are advised to contact potential advisors prior to application/ during application process).	After application and Prior to acceptance.
One/two page summary of research objectives.	Beginning of every quarter.
Identify course work and identify research area.	End of second term.
Identify potential committee members in consultation with major professor.	End of fourth term.
Complete research proposal and circulate among thesis committee.	End of fourth term.
File graduate program.	Before completion of 18 credits.
Program of study approval by thesis committee.	Recommended by end of seventh term.
Complete courses in graduate program	Recommended by end of eighth term.
Written comprehensive exam.	Recommended by end of ninth term.
Schedule oral comprehensive exam.	One week prior to Oral examination. Only after approval of major professor.
Oral comprehensive exam.	Recommended by end of tenth term.
<i>Further progress in program determined by the outcome of written and oral comprehensive exams.</i>	
Research and dissertation preparation.	A minimum of one full-time academic year (at least 36 credits) should be devoted to preparation of the thesis.
Complete dissertation draft and submit to major professor.	Six weeks before oral examination.
Schedule final defense with graduate school and submit pretext pages of thesis.	One week prior to Oral examination. Only after approval of major professor.
Complete dissertation draft and submit to committee.	One week before oral examination.
Oral Examination End of sixth term or later.	Only after approval of major professor.
Submit one bound copy of dissertation to major professor, department and graduate school.	After final approval by major professor.
<i>Students in PhD program must complete all requirements of the program within seven years of admission. Students with MS degrees from other institutions must complete the requirements in six years.</i>	