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University

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Graduate Student Handbook

Biological & Ecological Engineering

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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 and expectations 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. We recommend that students download a copy of this document when they commence their studies, as that will be the framework for their time in the department.

2. MISSION OF THE DEPARTMENT

Our mission is to be worthy of national and international recognition for integrated research and education in the programs broadly defined as Biological Engineering & Ecological Engineering. Our external 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 graduate programs leading to the Master of Engineering (MEng), Master of Science (MS) and Doctor of Philosophy (PhD) 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 complex earth systems. The curriculum is engineering-based with strong emphases in the life sciences and earth processes. 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@engr.orst.edu | Website:
<http://bee.oregonstate.edu>

3. RESEARCH FOCUS

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

Our Biological and Ecological Engineering program examines topics such as alternative landscape futures modeling, watershed management, dynamics of coupled human/natural systems, landscape restoration engineering, and ecohydrology. Beyond processes found purely in nature, BEE researchers in training, from undergraduate to post-doctoral, examine the use of bio-based processes and technologies for biofuels and high-value bioproduct development. Specific research topics in biological engineering include: agrivoltaics; biohydrogen production and biofuels; bacterial biofilm development; bioconversion processes, biomolecular separations,

and microscale fermentations; downstream processing of biological products; and, modeling of biological systems.

Water resource engineering activities, which at the graduate level are administered by the Water Resources Graduate Program ([WRGP](#)), 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.

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, water resource, or ecological engineering. A significant number of students join the department with undergraduate degrees in biology, natural resources, geology, etc. and are highly successful if they are willing to tackle the quantitative tools employed in engineering. A student's committee may require the student to take appropriate undergraduate courses to make up deficiencies in the undergraduate program, particularly those without engineering undergraduate degrees. A list of required 'Undergraduate Fundamentals' is part of the Checklist for Biological & Ecological Engineering Programs of Study and is included in this handbook. University rules indicate that credit received in undergraduate courses taken to overcome prerequisite deficiencies, may not be used as credit towards meeting the requirements for a graduate degree.

Applications must include a copy of the graduate school application, copies of transcripts, personal statement of objectives, and three letters of reference. PhD applicants should also provide a list of publications and research experiences. To help evaluate student potential, prospective graduate students writing samples as part of their application.

U.S. Citizens and Permanent Residents

A four-year baccalaureate degree from an accredited college or university is required for MS applicants.

A combined GPA of 3.0 on the last 90 credit hours of graded undergraduate work and all work completed thereafter is required to enter our graduate programs. With very rare exceptions, made on a case-by-case review by the graduate committee, would we accept a student with less than a 3.0 GPA.

4.2. *International Applicants*

Students seeking an MS or MEng degree need the equivalent of an American baccalaureate degree with a 3.0 average GPA.

Students seeking a PhD degree need the equivalent of an American master's degree with a 3.0 average GPA.

English language proficiency (TOEFL minimum score of 80 with a minimum score of 18 on each section. Applicants awarded a GTA must have a minimum of 22 on the Speaking section). TOEFL

scores must be no more than two years old at the time of registration. TOEFL is not required if you completed a baccalaureate or master's degree from an accredited school in the United States.

Sufficient financial resources to obtain required visas.

We strongly recommend reading the latest guidance found at the Graduate School's International Student requirements webpage for possible changes to Federal requirements:

<https://gradschool.oregonstate.edu/admissions/international>

5. APPOINTMENT GUIDELINES

5.1. *Provisional Admission*

The first requirement to gain admission is that a member of the faculty agrees to serve as the applicant's major professor. **For PhD candidates**, the Chair of the Graduate Committee or the Department Head must approve the admission.

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 will be found in the Graduate Catalog website.

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 PBL or 60 iBT could potentially be granted. This would require On-campus English language instruction prior to enrollment. We also accept Duolingo scores of 110 or higher (must include sub-scores), as well as IELTS of 6.5, with students awarded a GTA/GRA need a minimum speaking sub-score of 7.0. (<https://gradschool.oregonstate.edu/admissions/international>)

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 PLB or 80 iBT.

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. [Current University rules](#) indicate that an appointment must be 0.35 to 0.49 FTE ('full-time equivalence'). 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.

To maintain financial support, you will register for a minimum of 12 graduate level credits each term. It is the student's responsibility to sign up for sufficient credits – failure to do so will make payment of graduate support impossible. Students need to reach out to their major advisor and the administrative support staff with any technical issues that occur while registering. Thesis credits can be used to satisfy enrollment requirements for these students. Most student contracts require a minimum of twelve credit hours per term. It is also required that the student maintain a GPA of 3.0 or better is required for continued financial support. Please thoroughly review your contract for further guidance.

6.2. Graduate Teaching Assistantships

The department offers a few graduate teaching assistantships per year, organized by the Department Chair, in consultation with the professors who teach courses that need teaching assistants. These can be very important sources of funding for recruiting new graduate students or assisting who have run out of other resources.

The graduate student's advisor should bring any such needs to the attention of the chair. Students are advised not to ask the chair for these opportunities directly.

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 are on [BEE Scholarships](#).

7. POLICIES AND REQUIREMENTS

The information on the following pages is from the Oregon State University Graduate Catalog. Additional information is on the current Graduate Catalog website.

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 we discuss a problem, the sooner we can resolve it together.

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 student's application for graduation.

8.2. *Duties of the Student*

- It is the responsibility of the student to meet all deadlines and requirements.
- 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.

9. *ACADEMIC REQUIREMENTS*

A summary of academic requirements is on the Checklist for BEE Programs of Study, included in Appendix A. The MS and PhD academic requirements described below are general requirements. The BEE Graduate Committee and Department Head must approve any exceptions. Students need to bring any potential exceptions to the notice of major professor and BEE Graduate Committee at the earliest.

If you need to take a leave of absence, you must file the form to the Graduate School at least 15 working days prior to the first day of the term involved. Unless on an approved leave of absence, all graduate students in degree and certificate programs must register continuously for a minimum of 3 graduate credits, until their degree or certificate is granted or until their status as a credential-seeking graduate student is terminated. . When granted a leave of absence during any term, students need to withdraw from courses registered that term. If the student needs to take a leave during the summer term, they will not need to fill out this form.

BEE expects the graduate student to form their committee within the first two terms of attending OSU. All Doctoral students and Master's students who are writing a thesis (as well as all Master of Arts in Interdisciplinary Studies (MAIS) students) are required to include a Graduate Council Representative on their committee. The Graduate Council Representative (GCR) serves in the role of impartial committee member who advocates for the student and ensures compliance of all rules governing committee procedures. They must be present at your final defense of your thesis. You must select a GCR from the list generated by the online GCR list generation tool maintained by the graduate school.

9.1. *MS 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.

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 <https://catalog.oregonstate.edu/regulations/>

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 MS 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 but can be used in follow-on PhD programs.

An examining committee, which will consist of at least four graduate faculty members, will conduct the final oral examination: two in the major field, one in the minor field (or a professor from outside the major, if you have no minor), and (except for the non-thesis option) a Graduate Council Representative (GCR).

Departmental requirements for the MS degree complete a minimum of 45 credits that will 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.
- Eighteen (18) 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 two department seminars (BEE 507: Graduate Student Orientation, Journal Club, Graduate Research and Publication, and Oral Presentation Skills) that are intended to develop their understanding of the profession and to develop presentation skills. The student's major or minor professor may set additional requirements, by the department, or by the student's advisory committee as needed to strengthen his or her background.
- Twelve (12) credits of thesis (BEE 503) courses.
- Before completing 18 graduate credits and no later than 15 weeks prior to the defense, students must formulate a program of study in consultation with major professor and graduate program committee, usually by the end of the second term.
- 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.
- Full-time graduate students, who are not Graduate Research Assistants, are strongly encouraged to register for 16 credits per term, including thesis research.
- Student must arrange regular meetings (at least monthly) with major professor and graduate program committee (twice a year is recommended).

9.2. MEng - Non-Thesis Option

The MEng 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 a more 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 six project credits, taken 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.

9.3. PhD 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 78 credits of PhD thesis, (MS thesis credits cannot be included). There is no departmental total credit requirement outside of 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 dissertation. Gaining the ability to evaluate critically societal impacts and ethical issues associated with research in biological and/or ecological resource engineering is an important component of the PhD program. Toward this end, PhD 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 PhD 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 includes 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 two department seminars, BEE 607, intended to develop their understanding of the profession and to develop presentation skills.

- One (1) credit of additional seminar that focuses on professional topic areas and/or presentation skills.
- The student's major or minor professor may set additional requirements, by the department, or by the student's advisory committee as needed to strengthen his or her background.
- Graduate Minor

A graduate minor is an academic area that complements the major to address research objectives or long-term educational goals. Minors are not required in graduate programs at OSU or in BEE. On a MS or PhD 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 and be approved on the student's program of study.

9.4. Dual Major

For the MS or PhD degree, a student may pursue two graduate major areas instead of the traditional single major. Only one degree is awarded and students must satisfy all degree requirements for majors in both areas.

10. THESIS/DISSERTATION

10.1. Research

Graduate student's research project is the centerpiece of their 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.

MS students should have completed a research proposal by the end of their second term at OSU and PhD 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 are made by submitting a [Petition for Change Form](#).

10.2. Preparation

Every thesis must be grammatically correct, in 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.

This link provides detailed guidelines to prepare your thesis or dissertation:

<https://gradschool.oregonstate.edu/current/thesis-guide>. 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 at <https://gradschool.oregonstate.edu/graduate-student-success>.

11. EXAMINATIONS

11.1. PhD Preliminary Oral Exams

The purpose of the preliminary exam is to ensure the student's readiness to advance to candidacy. They must demonstrate knowledge of major and minor fields, and the ability to plan and conduct PhD 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:** the Department requires a written comprehensive exam. 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.
 - 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.
 - 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.
 - Fail without an opportunity to retake exam: The student will be terminated from the graduate program.
 - 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. *MS and PhD 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 and full campus 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 MS or PhD 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 for MS, and two weeks for PhD 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:

- 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.
- 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.
- Fail without an opportunity to retake exam: The student will be terminated from the graduate program.
- 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 3.0 GPA for two consecutive terms, or who cannot maintain a 3.0 GPA after three terms, will be notified that the student 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 programs must complete all requirements of the program within seven years or nine years for PhD students.

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.

13.1. Academic criteria

Students must enroll for a minimum of 12 credits although department strongly recommends enrollment in 16 credits. Students must maintain a minimum 3.0 GPA in all quarters. Students must meet minimum enrollment requirements to be eligible for financial aid/assistantship. Any student who receives less than a 3.0 GPA for two consecutive terms, or who cannot maintain a 3.0

GPA after three terms, will be notified that the student 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.

13.2. 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 student's major advisor and committee will decide the format for the research proposal. 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.

13.3. 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 the student's own 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 seek 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. Some BEE advisors place requirements of a certain number of accepted and submitted publications on their PhD students. We encourage students to speak directly to their advisors about such rules and expectations.

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. Academic employers expect significant teaching experience, especially for PhD students. 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, the Department Head may initiate a formal process under university guidelines. Use of the University Ombuds is worth considering if you have a conflict that has not otherwise been resolved. Further resources for conflict resolution can be found at <https://studentaffairs.oregonstate.edu/tags/conflict-resolution>.

16. GENERAL REGULATIONS CONCERNING FACILITIES

16.1. ID Cards, Keys and Office Space

All Oregon State University students need to request and receive a photo 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 on the University's website.

Keys to access labs will be based on individual needs. The Department office will need approval from the major professor. Keys can be obtained from the key shop located on campus, in the MU. Access to secure labs will require a Criminal History Check, paid for by your advisor, before a key can be issued.

Keys are the property of OSU and are the student's responsibility. Keys must not be shared/replicated under any circumstances. Please report any lost keys immediately. Office space is 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:

- Within the department
- At the College of Engineering
- Through OSU computing support.

Students should visit the [**BEE Department home page**](#) for updated policies regarding computer access.

All BEE students are given a computer account that is centrally administrated. One element is an unlimited “Box” account for cloud-based file storage for materials, which are part of your educational efforts. Students are also given an ENGR account, which is accessible from any computer on campus, as long as you login to the ENGINEERING domain. 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.

Departmental stationary, envelopes and postage are not allowed to be used

16.3. Printing, Copying, and Other Services

Departmental staff may not be asked by graduate students for assistance in matters that are of a personal nature. This includes course work, forms, copying, thesis preparation, and personal correspondence.

Long-distance telephone calls within the United States are unlimited and free, but you must have an authorization code from your advisor to call numbers off campus. Long distance calls outside of the United States also require the authorization code, and calls must be approved by your advisor ahead of time. Use non-telephonic communication means whenever possible. Personal long-distance telephone calls are not to be made when using OSU 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 is expected to pay for any charges associated with the calls.

The copy machine in the main office is available with approval. 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



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personal access code (available from the office staff) and is five cents per page for single-sided copies. This must be paid **in cash**. 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 personnel. 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. It is important to close windows and lock doors in graduate student offices when leaving. Closing windows and doors in faculty offices and the main office are the responsibility of faculty and staff.

Because many people use labs, 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 are authorized to drive motor vehicles on university business with advisor approval. The Motor Pool is the first choice for all driving. To use OSU vehicles the student must read and sign the proper authorization forms, available on the OSU Motor pool website. If alternative sources of vehicles are required (rentals out of town, trips when Motor Pool cannot be used) students must receive authorization from their advisor and the front office. Reimbursement requests for mileage with personal vehicles only can be submitted via a travel reimbursement request to the front office.

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

17. GRADUATE FACULTY

These faculty have been granted the right to advise graduate students in the BEE program.

17.1. Department Faculty

Adam Ward

Professor & Dept. Head

(541) 737- 7250

Adam.Ward@oregonstate.edu

PhD, Penn State

Hydrology, environmental transport fate, watershed management



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John P. Bolte

Professor

(541) 737-6303

john.bolte@oregonstate.edu

PhD, Auburn University

Watershed modeling, decision support, geographic information systems

Frank W. R. Chaplen

Associate Professor | Asst. Director of EcoE Undergraduate Program

(541) 737-1015

Frank.Chaplenf@oregonstate.edu

PhD, University of Wisconsin-Madison

Biocatalyst characterization, bioprocess improvement through rational biocatalyst modification, cellular engineering, metabolic pathway engineering

Stephen P. Good

Associate Professor, Department Head of WRGP | Asst. Director of BEE Graduate Program

(541) 737-2118

Stephen.Good@oregonstate.edu

PhD, Princeton University

Ecohydrology, environmental remote sensing

Chad W. Higgins

Associate Professor

(541) 737-2286

Chad.Higgins@oregonstate.edu

PhD, The Johns Hopkins University

Agrioltaics, environmental fluid mechanics, land atmosphere interactions

Gerrad D. Jones

Assistant Professor

(541) 737-4534

Gerrad.Jones@oregonstate.edu

PhD, University of Nevada, Reno

Environmental chemistry, water quality, biogeochemical cycling, statistical and machine learning modeling

Hong Liu

Professor

(541) 737-6309

Hong.Liu@oregonstate.edu



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PhD, University of Hong Kong

Sustainable bioenergy production, biohydrogen production, Microbial fuel cell technology

Salini Sasidharan

Assistant Professor

(541)737-2041

Salini.sasidharan@oregonstate.edu

Flinders University of South Australia

Groundwater quality and quality management, groundwater well, groundwater recharge

John S. Selker

Professor

(541) 737-6304

John.Selker@oregonstate.edu

PhD, Cornell University

Groundwater quality, hydrology and modeling

Desiree Tullos

Professor

(541) 737-2038

Desiree.Tullos@oregonstate.edu

PhD, North Carolina State University

Ecohydraulics, river morphology and restoration

Maria Zamora Re

Assistant Professor

Maria.ZamoraRe@oregonstate.edu

(541) 737-8206

PhD, University of Florida, Gainesville

Best management practices and precision agriculture for irrigation scheduling in agriculture production.

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 & Ecological Engineering and are approved for some or all of the following department-related duties:

- Act as a co-major advisor of MS and/or PhD students
- Direct non-thesis option students
- Teach graduate courses in the department
- Serve on thesis committees



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Dominique M. Bachelet

Associate Professor

(541) 757-0687 ext. 8

Dominique.Bachelet@oregonstate.edu

PhD, Colorado State University

Ecosystems Modeling, Global Climate Change

Gordon E. Grant

Professor Geosciences Department/OSU PhD

Gordon.Grant@oregonstate.edu

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

Jack.Istok@oregonstate.edu

Civil, Construction and Environmental Engineering/OSU PhD, Oregon State University

Soil and water engineering, aquifer testing, numerical modeling of groundwater flow, bioremediation

Stephen Lancaster

Associate Professor Geosciences Department/OSU

stephen.lancaster@oregonstate.edu

PhD, Massachusetts Institute of Technology

Geomorphology, hydrology, mass-movement processes, sediment dynamics, river meandering, geomorphic evolution and analysis, numerical modeling

Michael T. Morrissey

Professor Food Science and Technology/OSU

michael.morrissey@oregonstate.edu

PhD, Oregon State University

Seafood processing, quality standards in seafood, biochemical/microbial changes in seafood

Michael H. Penner

Associate Professor Food Science and Technology/OSU

pennerm@oregonstate.edu

PhD, California, Davis

Lignocellulose 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:

Gewin, Virginia. “How to Write a First-Class Paper.” *Nature News*, Nature Publishing Group, 28 Feb. 2018, <https://www.nature.com/articles/d41586-018-02404-4>.

[Graduate Teaching Assistant Training](#)

[CoE’s International Graduate Students Community](#) website with various helpful resources.

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 consulted to incorporate best policies into our graduate program at Biological & Ecological Engineering Department.

20. APPENDIXES

Appendix A: Checklist for Biological & Ecological Programs of Study

Depending on your academic pathway, one of the below three program forms (MEng, MS, and PhD) are 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 Name:		
Degree: MEng		
Graduate Requirements		
Has taken all of the core undergraduate requirements? Must complete before graduation.	Yes	No
Core Requirements	Required	Taken (to be filled out by student)
BEE 505 READING AND CONFERENCE	1	
BEE 507 SEMINAR ¹	2	
BEE 529 BIOSYSTEMS MODELING TECHNIQUES	3	
ENGR 520 MENG INTRODUCTION TO PORTFOLIO	1	
ENGR 521 MENG PORTFOLIO COMPLETION	1	
Biological & Ecological Engineering		
Select at least 18 credits from the following courses, as approved by major professor and committee:	18	Taken (to be filled out by student)
BEE 511 GLOBAL ENVIRONMENTAL CHANGE: USING DATA TO INFORM DECISIONS	3	
BEE 512 PHYSICAL HYDROLOGY	3	
BEE 533 IRRIGATION SYSTEM DESIGN	3	
BEE 540 ENVIRONMENTAL TRANSPORT PROCESSES	4	
BEE 542 VADOSE ZONE TRANSPORT	3	
BEE 546 RIVER ENGINEERING	4	
BEE 549 REGIONAL HYDROLOGIC MODELING	4	
BEE 558 NONPOINT SOURCE POLLUTION ASSESSMENT & CONTROL	3	
BEE 568 BIOREMEDIATION ENGINEERING	4	
Additional Science & Engineering		
Select at least 16 credits as approved by major professor and committee	16	
Human Dimensions		
Select at least 3 credits as approved by major professor and committee	3	
Total Credits	45	
Major Advisor Signature	Date	
Student Signature	Date	

¹Students may substitute 2 credits of a 500-level professional seminar course for 2 credits of BEE 507

Student Name:			
Degree: MS			
Graduate Requirements			
Core Requirement		Required	Taken (to be filled out by student)
BEE 529	BIOSYSTEMS MODELING TECHNIQUES	3	
BEE 507	SEMINAR ¹	3	
Select 9 credits of graduate-level biological science courses (or science alternative) as approved by major professor and committee		9	
Select 18 credits of graduate-level engineering courses with significant components of engineering science and/or design from the College of Engineering		18	
Thesis			
BEE 503	THESIS ²	12	
Total Credits		45	
<u>Major Advisor Signature</u>		<u>Date</u>	
<u>Student Signature</u>		<u>Date</u>	

¹Students may substitute 3 credits of a 500-level professional seminar course for 3 credits of BEE 507

²Students may substitute 3-6 credits of BEE 506 and 6-9 credits of engineering electives for BEE 503

Student Name:			
Degree: PhD			
Graduate Requirements			
Required Core		Required	Taken (completed by student)
BEE 529	BIOSYSTEMS MODELING TECHNIQUES	3	
Seminar			
BEE 607	SEMINAR ¹	3	
Electives			
Select 12 credits of graduate-level biological science courses (or science alternative) as approved by major professor and committee		12	
Select 12 credits of graduate-level engineering courses with significant components of engineering science and/or design from the College of Engineering		12	
Thesis			
BEE 603	THESIS ²	78	
Total Credits		108	
Major Advisor Signature		Date	
Student Signature		Date	

¹ Students may substitute 3 credits of a 600-level professional seminar course for 3 credits of BEE 607

² Students may substitute graduate-level engineering or science electives for 34 credits of BEE 603 in consultation with the major professor and committee



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*Appendix B: Criteria and timelines for satisfactory student progress
(see following pages, one each for MS, MEng, and PhD)^{1,2}*

¹ Students in MS/MEng program must complete all requirements of the program within five years of admission. PhD students need to complete their work within seven years of admission.

² MS and PhD flowcharts can be found on the Graduate School's website:
<https://gradschool.oregonstate.edu/>

Flow Chart For Master's Degree Completion

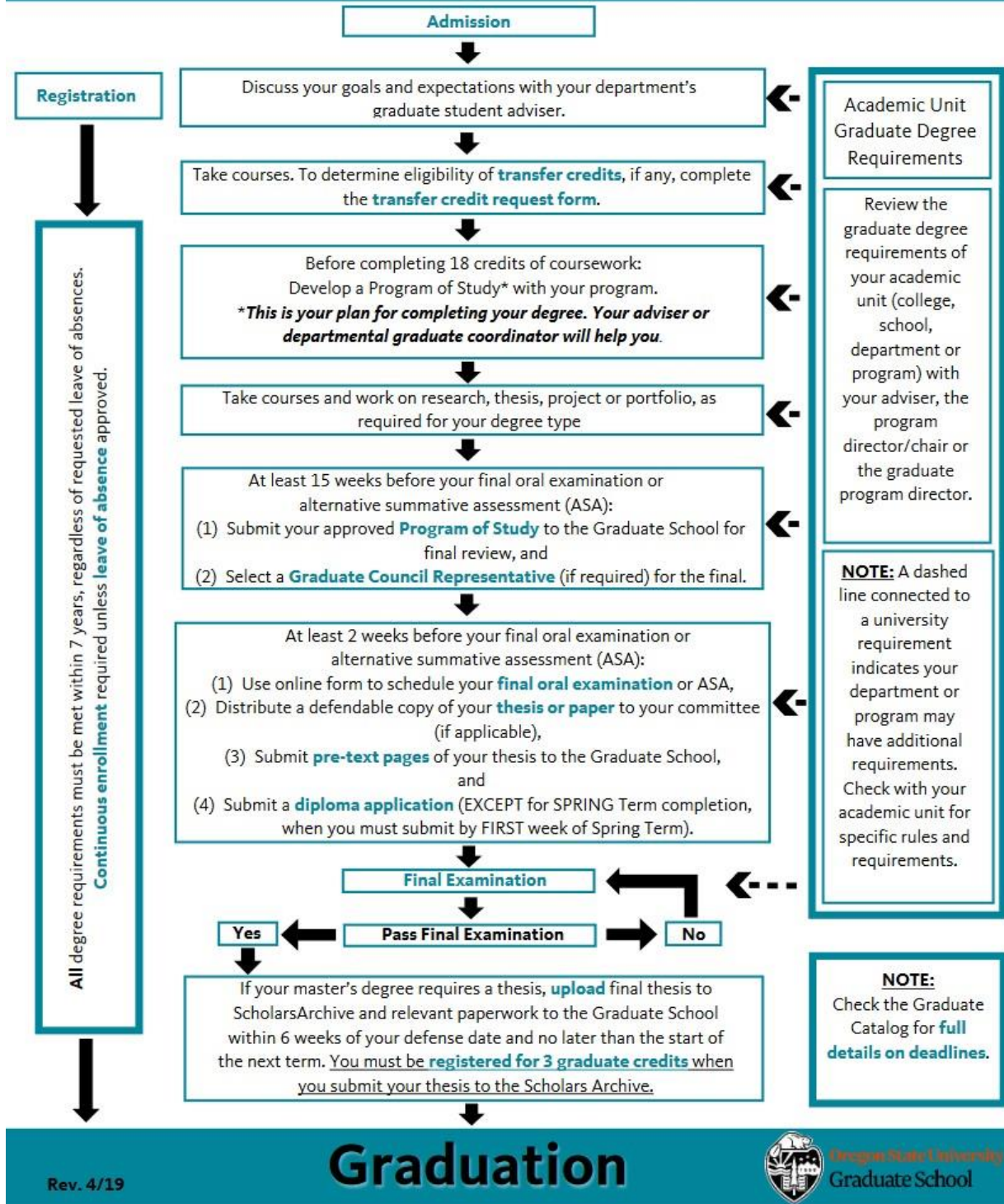
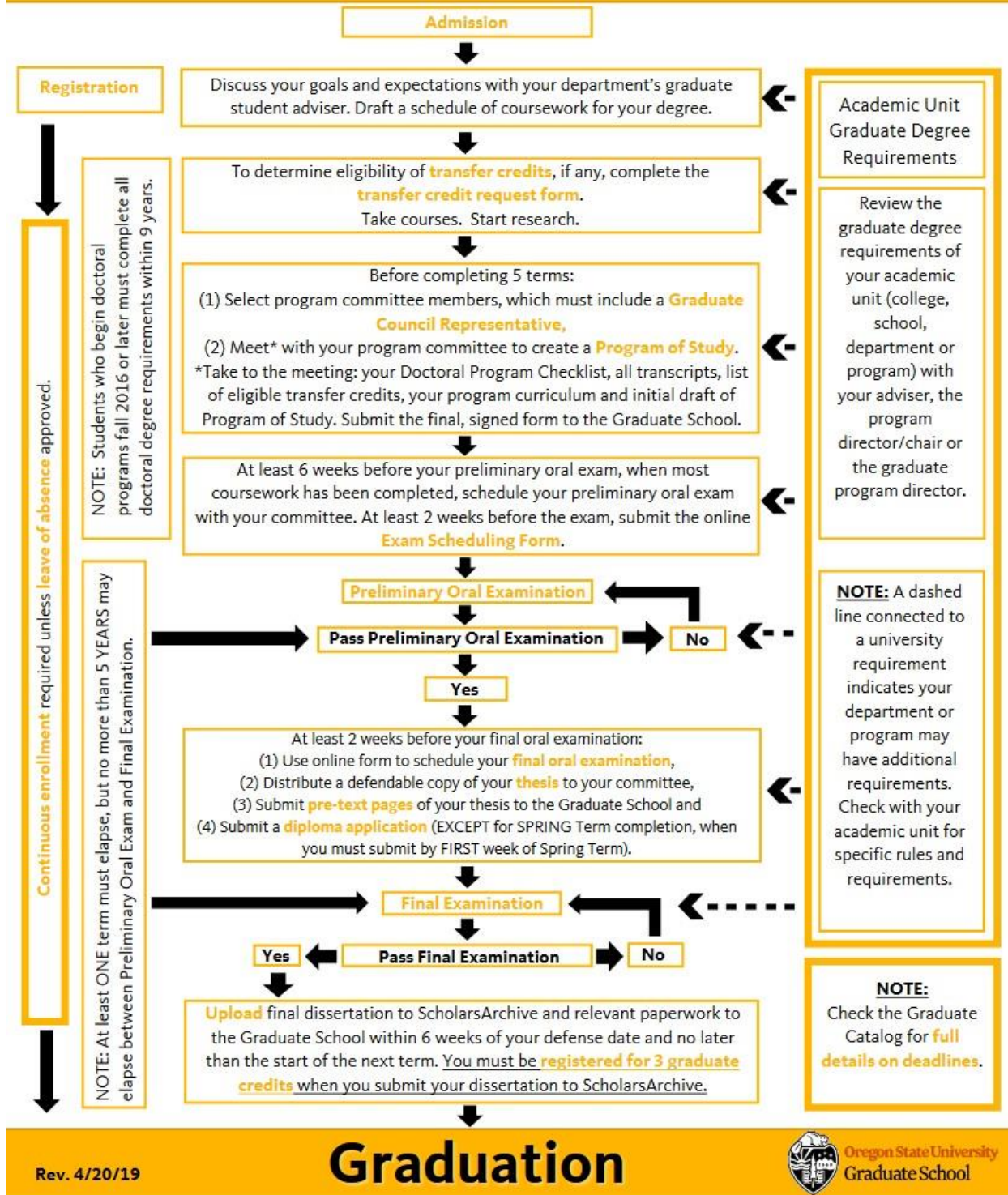


Table 2: Schedule for MEng students (non-thesis option).³

Procedures for MEng	
Identify major professor (You are advised to contact potential advisors prior to application/during application process)	After application but prior to acceptance. Should you be accepted without an advisor, the graduate committee will be assign one to you.
Work with your advisor to roughly draft your proposed graduate coursework	End of first term
Start the selection process and identify two additional committee members	End of second term
File Program of study	Before completion of 18 credits
Notify your advisor, committee and department admin of your intended graduation term	At least one term before your intended graduation term
Compare Program of Study forms and transcripts for consistency	1 term before your intended graduation term
If needed, file a Petition to Change Program form	
Register for ENGE 599 Portfolio Class	
File Exam Scheduling Form (alternative summative assessment)	The portfolio will be used in lieu of a final oral exam as an alternative summative assessment
File a Diploma Application	As directed by the ENGR 599/521 course, (normally at the beginning of final term)
A Graduate School survey will be emailed to you. A departmental exit survey will also be emailed to you	A month after graduation

³ Further details will be given to you when you take the Portfolio courses. Please refer to these resources when completing your degree for most current information.

Flow Chart For Ph.D. Completion





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Appendix C: Defense Preparation Checklist

The purpose of this document is to provide an overview of the steps needed to prepare for your defense. You are receiving this form because we have received an approved Program of Study from the Graduate School for you. This list applies to both BEE & WRGP students preparing to defend their thesis, dissertation or final project. If you have any questions about these steps or have any suggestions to improve this form, please contact Catherine Mullins (mullcath@oregonstate.edu).

Resources

Title	Link
How-to Videos	https://gradschool.oregonstate.edu/video
Graduate School Forms	https://gradschool.oregonstate.edu/forms
Graduate School Guide to Success	https://gradschool.oregonstate.edu/success
Exam Scheduling Form	https://gradschool.oregonstate.edu/forms#event
Graduate Funding	https://gradschool.oregonstate.edu/finance
Grad Writing Center	https://gradschool.oregonstate.edu/graduate-writing-center
Diploma Application	https://gradschool.oregonstate.edu/formlink/14641
Graduate Council Rep List	https://gradschool.oregonstate.edu/faculty/gcr-guidelines
Commencement Deadlines	https://gradschool.oregonstate.edu/current/commencement
Room Scheduler	https://bee.oregonstate.edu/bee/timeline-orientation-graduation
Zoom	https://is.oregonstate.edu/zoom
Electronic Submission Approval Form	https://gradschool.oregonstate.edu/formlink/14716

Appendix D: Defense preparation details

Verify your **Program of Study** is on file with the Graduate School.

At least two weeks prior to defense date, file the **Exam Scheduling form** with the Graduate School

The Exam Scheduling Form may require additional changes to the Program of Study form.

Putting the room on your Exam Scheduling form for the Graduate School DOES NOT reserve the room, it only tells your GCR where to show up. See more about scheduling below.

Review thesis/dissertation/project for committee

Preliminary review copies of your thesis are due to your committee TWO WEEKS before your defense session—please see your advisor for specifics on content and timeline for this particular item!

Student Status

Register for at least three credits the term you defend.

If you are defending in summer term, you should register for the summer session that coincides with your defense date.

GRA, GTA & Fellowship recipients typically need to be registered for 12 credits during the school year (full time status); or 9 credits in the summer. Refer to your award letter to verify.

Self Care. This is a hard program and we want to make sure you are taking care of yourself. Take breaks. Take time off. Ask for support from your advisors, other faculty and staff. Know that there are resources on campus here to support you.

Here are a few (not an exhaustive list):

<https://hr.oregonstate.edu/work-life/culture-care/mental-health-resources>

<https://uhds.oregonstate.edu/food/food-insecurity>

<https://sites.google.com/oregonstate.edu/virtualmindspa/>

Defense Scheduling. Set a day and time with your committee. You must reserve the defense room and/or electronic venue accessible to all committee members.

It is also mandatory to let the department know that you will be defending. This will also allow enough time to schedule a room as well as promote your defense. The request form can be found here: [Defense Information Request for BEE](#). Please reach out at least two months in advance ~ a month is better!

If you intend on meeting in person, for now, please make sure you choose a room with Zoom capabilities, so that your defense can be seen by anyone who cannot attend.



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- Gilmore Annex: <https://bee.oregonstate.edu/bee/reservations>
- The library: <https://library.oregonstate.edu/meet-study-here-o>
- Grad Student Commons: <https://guides.library.oregonstate.edu/graduate-student-commons>
- CEOAS: <https://ceoas.oregonstate.edu/ceoas-room-reservations>
- Campus-wide rooms: <https://25live.collegenet.com/pro/oregonstate#!/home/dash>
- *Go online and find a classroom that meets your specific needs for the date/time of your defense.*
- *Then reach out to Catherine.Mullins@oregonstate.edu and inform her which room you would like to use, the date of your defense, and times.*
 - *As a precaution, you are encouraged to give her two alternative rooms for this event, in the event she cannot secure your first choice.*
 - *She will then go ahead and reserve it.*

Zoom. Post pandemic, many students still opt for a Zoom only defense (as of 8/2022), though most now prefer to be in person, with Zoom options for committee members, friends and family who cannot attend in person. Please work with your advisor and committee to plan accordingly. Technology for remote participation in your defense is your responsibility. There is no assumed IT support from either Student Services or RCS.

Announcements. We must publicly announce your defense TWO WEEKS prior to the defense. This is a program requirement. Send the following information to Catherine Mullins, to announce in the OSU Calendar, WRGP & BEE Facebook pages, WRGP & BEE Mailing lists, and OSU Today:

- | | |
|--|----------------|
| • Full Legal Name | • Thesis Title |
| • Degree Program | • Date |
| • Major Advisor | • Time |
| • Graduate Counsel Representative | • Location |
| • Committee Members | |
| • Photo of yourself or research (optional) | |

Let the Department know. Send Catherine a list of all committee members. If someone needs to be BEE or WRGP Graduate Faculty, we need to submit paperwork well ahead of time.

Timing. Be aware that you can defend up to the last day before the start of the [next] term and that still counts as the current term but be careful as this shortens up the time you have to get your final revisions in to the Graduate School. Extensions are sometimes granted.

MS to PhD students. Contact Student Development Office or the Graduate School for more information BEFORE your defense as you need to do a concurrent degree form so that your degree completion and continuation can be seamless.

The Day of the Defense. Snacks are **not** necessary but are sometimes provided by the student defending. Coffee, tea, and light snacks like cookies or fruit are common items. Catherine has a coffee carafe she can loan out on a limited basis.



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Webinar and/or video: student responsibility to arrange. Catherine has a video camera and tripod that can be loaned out as needed.

Post defense. Revisions are due in 6 weeks or the first day of the next term, whichever comes first!

Submit the ETD Submission Approval form to the Graduate School along with a copy of the title page once the final thesis/dissertation is approved and uploaded to ScholarsArchive.

Do you intend to 'walk' at graduation? Verify commencement deadlines on the Graduate School's website.

You will want to clear at your desk and return in your keys once your revisions are final. If you have a departmental computer or laptop, or any other departmental equipment, these will need to be returned.

Breathe deeply! When you make it this far, then congratulations are in order!



Appendix E: Graduate Learning Outcomes

BEE Graduate Learning Outcome (GLO) Rubric Sheet

Student Name _____

Program of Study (BEE/WRS/Other): _____

Advisor: _____

Degree Level (MS, MEng, PhD): _____

Title of Thesis/Project: _____

Evaluation/Guidance	Does not meet Expectations	Meets Expectations	Exceeds Expectations
1. Problem Definition: Has stated the research/project problem clearly, providing motivation for undertaking the research			
2. Literature and Previous Work: Demonstrated sound knowledge of literature in the area, and of prior work on the specific research/project problem			
3. Impact of Research/Project: Demonstrated the potential value of solution to the research/project problem in advancing knowledge within the area of study			
4. Solution Approach: Has applied sound state-of-the-art research/project methods/tools to solve the defined problem and has described the methods/tools effectively			
5. Results: Analyzed and interpreted research/project results/data effectively			
6. Quality of Written Communication: Communicates research/project results clearly and professionally in written form			
7. Quality of Oral Communication: Communicates research/project results clearly and professionally in oral form			
8. Critical Thinking: Has demonstrated capability for independent research/project in the area of study and expertise in the area			
9. Broader Impact: Demonstrated awareness of broader implications of the concluded research/project. Broader implications may include social, economic, technical, ethical,			



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business, etc. aspects.			
10. Publications: Journal, conference, or some other scholarly publications have resulted (or are anticipated) from this research/project			

Overall Assessment: The assessment of the overall performance of the candidate based on the evidence provided in items 1 – 10 above.

CRITERIA	PERFORMANCE RATINGS for THESIS EXAM	
	<i>Does NOT PASS Exam</i>	<i>PASSES Exam</i>
OVERALL, My rating of the Thesis / Project Paper indicates that it:	Does not meet expectations	Meets expectations

Examining Committee Members:

_____	_____	_____
Printed Name	Signature	Date
_____	_____	_____
Printed Name	Signature	Date
_____	_____	_____
Printed Name	Signature	Date
_____	_____	_____
Printed Name	Signature	Date
_____	_____	_____
Printed Name	Signature	Date

Examiner: Please use the space below, reverse side, or an additional sheet for written commentary as needed.

Once signed by committee members, please return this form to Catherine.Mullins@oregonstate.edu or send via campus mail to 116 Gilmore Hall. Thank you!