



Bioengineering

2019-2020

Graduate Handbook



Oregon State
University

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COURSEWORK REQUIREMENTS

RECOMMENDED PREREQUISITE COURSEWORK

The following is recommended prerequisite coursework for the Bioengineering Graduate Program core curriculum.

Students with a B.S. degree in a non-engineering undergraduate degree are strongly encouraged to take the following courses prior to enrolling in the BIOE core:

- Math through Differential Equations
- One year of Physics

REQUIRED COURSEWORK

All BIOE graduate students (regardless of degree) are required to take the following four BIOE core courses:

| | | | |
|------|-----|-----|--|
| BIOE | 511 | (3) | Cellular and Molecular Bioengineering |
| BIOE | 512 | (4) | Modeling of Physiological Systems |
| BIOE | 513 | (2) | Drug and Medical Device Regulation in Technology Development |
| CBEE | 507 | (3) | Seminar: Professional Development (F/W/Sp - 3 credits)* |

School Seminar: All newly-enrolled MS and PhD graduate students are required to take the School seminar course CBEE 507 Professional Development section, for the first year (3 credits). This course is intended to develop your understanding of the profession, to introduce the research activities that take place in this School, and to develop professional skills including literature searching and citations, communication skills, ethics, and navigating graduate school. In year two and beyond, all enrolled MS/PHD students holding a GRA/GTA position are required to register for CBEE 507 Seminar: Presentation, all terms(F/W/Sp).

MEng students are required to enroll in ENGR 599/520 Portfolio Prep in their first term and ENGR 599/521 Portfolio Completion during their last term in residence to support completion of their final portfolio (more details below). They will also enroll in CBEE 507 Seminar: Professional Development in their first **fall term. These three courses are the required 3 core seminar credits for MEng students.*

ELECTIVE COURSE SELECTION

Ph.D. students must take at least 27 credits of non-blanket courses. In total, PhD students must complete 108 graduate credits and 36 must be thesis credits (BIOE 603).

M.S. students must take a total of 45 graduate credits and 12 of those credits must be thesis credits (BIOE 503). At least 27 credits of non-blanket courses are required.

M.Eng. students must take a total of 45 graduate credits. Thesis credits cannot be used and blanket credits are limited to a maximum of 9. Thus, at least 36 credits of non-blanket coursework is required.

Note: Blanket courses are courses with a zero as the second number, e.g., BIOE 507. Thesis credits (BIOE 503 or BIOE 603) do not count as blanket credits.

For all BIOE graduate degrees, at least half of the non-blanket courses must be graduate stand-alone courses. The remaining courses can be the 500 component of 400/500 slash courses.

Courses should be selected in consultation with your faculty advisor. Consideration should be given to your research area, your background, and achieving a balance between breadth and depth. Typically students choose a range of courses in each of the following categories: engineering fundamentals, mathematics and statistics, biomedical science, and bioengineering. Some representative courses in each of these categories are provided below. (This is a non-exhaustive list.)

Bioengineering:

| <i>Course number</i> | <i>Course title</i> | <i>Credit hours</i> |
|----------------------|--|---------------------|
| BIOE 540 | Bioconjugation | 3 |
| BIOE 545 | Surface analysis | 3 |
| BIOE 557 | Bioreactors | 3 |
| BIOE 562 | Bioseparations | 3 |
| ECE 599 | Bioelectronic Systems and Devices | 3 |
| CS 546 | Networks in Computational Biology | 3 |
| CS 519 | Algorithms for Computational Molecular Biology | 3 |
| CS 584 | Human Factors Programming Languages | 4 |
| IE 545 | Human Factors Engineering | 4 |
| IE 546 | Human Factors Engineering II | 4 |
| ROB 567 | Human-Robot Interaction | 4 |
| ROB 562 | Human Control Systems | 4 |
| KIN 523 | Biomechanics of Motor Activities | 3 |
| KIN 525 | Biomechanics of Musculoskeletal Injury | 3 |
| CE 554 | Driving Simulation | 3 |
| H 594 | Applied Ergonomics | 3 |
| H 599 | Advanced Ergonomics | 3 |
| ME 513 | Bio-Inspired Design | 4 |
| NSE 583 | Radiation Biology | 3 |
| VMB 631 | Mathematical Modeling of Biological Systems | 3 |

Biomedical Sciences:

| <i>Course number</i> | <i>Course title</i> | <i>Credit hours</i> |
|----------------------|--|---------------------|
| VMB 521 | Animal Models | 3 |
| VMB 524 | Bioanalytical Chemistry | 3 |
| VMB 670 | Introduction to Systems Biology | 2 |
| VMB 671 | Molecular Tools | 3 |
| VMB 673 | Comparative Immunology | 3 |
| VMB 674 | Vaccines and New Therapies | 3 |
| BB 585 | Applied Bioinformatics | 3 |
| MCB 525 | Techniques in Molecular and Cellular Biology | 3 |
| MCB 554 | Genome Structure, Organization and Maintenance | 4 |
| MCB 555 | Genome Expression and Regulation | 4 |
| MCB 576 | Introduction to Computing in the Life Sciences | 3 |
| PHAR 525 | Foundations of Drug Action I | 3 |
| PHAR 574 | Nanomedicine | 3 |

Mathematics and Statistics:

| <i>Course number</i> | <i>Course title</i> | <i>Credit hours</i> |
|----------------------|---|---------------------|
| ST 515 | Design and Analysis of Planned Experiments | 3 |
| ST 592 | Statistical Methods for Genomics Research | 3 |
| MTH 528 | Stochastic Elements in Mathematical Biology | 3 |
| ME 526 | Numerical Methods for Engineering Analysis | 3 |

Engineering Fundamentals:

| <i>Course number</i> | <i>Course title</i> | <i>Credit hours</i> |
|----------------------|-------------------------------------|---------------------|
| ECE 564 | Digital Signal Processing | 4 |
| ME 546 | Convection Heat Transfer | 3 |
| ME 565 | Incompressible Fluid Mechanics | 3 |
| CHE 520 | Mass Transfer | 4 |
| CHE 537 | Chemical Engineering Thermodynamics | 4 |

GENERAL INFORMATION REGARDING DEGREE PROGRAMS**ADVISOR SELECTION**

PhD and MS students should select a research advisor during their first term at OSU. With assistance from CBEE, students will identify and contact faculty members to set up a meeting to discuss research opportunities. In addition to meeting with faculty, it can also be helpful to meet with graduate students, attend lab meetings and visit the lab. At the end of the term, students will submit an Advisor Selection Form listing their top three choices for preferred advisors. The selection process will be finalized by the start of the next term. The student must sign a “letter of intent” to work with the specific advisor. This agreement is binding except in extraordinary circumstances. If a student believes a change of advisor is warranted they are encouraged to talk with the Graduate Program Coordinator.

MEng students will be assigned an advisor by the Graduate program Coordinator at the start of their second term in the program.

GRADUATE DEGREE PUBLISHING EXPECTATIONS

Publication of M.S. and Ph.D. level research findings in the peer reviewed literature is vital to the success of our graduates and reputation of our graduate program. It is generally on the basis of these widely available, peer- reviewed, manuscripts that the quality and impact of one’s research endeavors is assessed and potential for future success evaluated. Stated another way, simply completing a M.S. thesis or Ph.D. dissertation is generally not sufficient for attainment of the career goals of students and faculty.

In general, publishing approximately 3 manuscripts on the basis of a Ph.D. dissertation and 1 manuscript on the basis of M.S. research are viewed as reasonable targets. Specifics of these expectations, including guidelines and timelines, are matters to be arranged between students and their faculty advisors.

Issues surrounding the publication of peer reviewed manuscripts and completion of M.S. theses and Ph.D. dissertations are intimately intertwined. This fact is recognized by the Graduate School and facilitated by so-called “manuscript-based” theses where theses and dissertations can package several published and/or draft publications into a single document.

PhD PROGRAM IN BIOENGINEERING

PhD students must complete a total of 108 graduate credits, including at least 27 credits of non-blanket courses and 36 thesis credits (BIOE 603). No more than 15 credits of blanket-numbered courses, other than thesis, may be included in the minimum 108-credit program. A minimum of one year of residence, continuously, at OSU (i.e., three consecutive quarters as a full time student) is required. At least half of the non-blanket courses must be graduate stand-alone courses. The remaining courses can be the 500 component of 400/500 slash courses. Note: blanket courses are courses with a zero as the second number, e.g., CBEE 507.

For other regulations, see the OSU Graduate School Catalog (<https://catalog.oregonstate.edu/college-departments/graduate-school/#policiestext>).

A program of study form must be approved during a meeting with the student's committee and filed with the graduate school. The program of study defines the student's path to completion of coursework, and, once approved, it becomes the obligation of the student to complete the requirements as formulated. Doctoral students are required to submit the program of study form by the fifth term, but students are encouraged to complete the program of study early so they can get input from their committee. Changes in the program may be made by submitting a [Petition for Change of Program form](#) available in the Graduate School.

Coursework completed as part of a Master's degree (MS or MEng) can be transferred for credit towards the doctoral degree with the consent of the student's doctoral committee. Completion of the [Transfer Credit Request Form](#) is required if these credits were obtained outside of OSU.

A Ph.D. degree student **without** an OSU M.S. degree in Bioengineering must take the following 4 BIOE core courses:

| | | |
|----------|-----|--|
| BIOE 511 | (3) | Cellular and Molecular Bioengineering |
| BIOE 512 | (4) | Modeling of Physiological Systems |
| BIOE 513 | (2) | Drug and Medical Device Regulation in Technology Development |
| CBEE 507 | (3) | Seminar: Professional Development (F/W/Sp - 3 credits) |

The following steps will be completed in the BIOE Ph.D. program:

- (1) Approval of graduate program of study
- (2) Preliminary oral examination
- (3) Dissertation proposal meeting
- (4) Final oral examination
- (5) Thesis submission

DOCTORAL COMMITTEES

The principal authority over a student's program resides with the student's Doctoral Committee. This committee is responsible for assuring that University and School requirements are satisfied, monitoring student progress, assigning and approving courses of study, approving dissertation topics and paths forward, and administering preliminary and final oral examinations.

The committee consists of at least 5 members:

- the student's major professor;

- an additional BIOE faculty member;
- a faculty member from the graduate faculty-at-large;
- the student's minor professor, or if no minor is selected, committee member may be from graduate faculty at-large; and
- one Graduate Council Representative.

The committee is originally formed, with approval from the major professor, at the student's invitation. The Graduate Council Representative is selected from a list generated by the [online GCR list generation tool](#). The GCR is a permanent member of the committee and *must* attend all committee meetings, including the preliminary program of study committee meeting, the oral preliminary exam, the dissertation proposal meeting, and the final examination (dissertation defense).

The Committee should be appointed after advisor selection is complete. The committee should be formed during spring term of the first year.

MATRICULATION / CANDIDACY

Matriculation (first term of attendance) qualifies the student to:

- a. select a general area of dissertation research, and
- b. identify a major professor.

After matriculation, the student must pass a preliminary oral exam (see below).

PRELIMINARY ORAL EXAMINATION FOR DOCTORAL STUDENTS

Students must successfully complete the preliminary oral exam to advance to candidacy in the PhD program. The preliminary oral exam is taken near the completion of all course work on the Program of Study, typically around spring quarter of the second year.

To schedule the oral preliminary exam, students must contact the members of the committee to arrange the date, time, and place, then schedule the exam with the Graduate School not less than two weeks before the examination using the [Exam Scheduling Form](#).

Students must be formally enrolled (for a minimum of 3 credits) during the term in which the exam takes place. For the preliminary oral exam, students must write a research proposal (~10 pages) on a topic provided by their advisor, orally defend the research proposal, and answer questions from the committee on the proposal topic as well as topics from the student's coursework. The written proposal should be submitted to the committee at least one week prior to the oral exam. The topic will be provided to the student 3 weeks before the written document is due to the committee.

DISSERTATION PROPOSAL MEETING

After completing the preliminary oral exam and advancing to candidacy, students should schedule a dissertation proposal meeting with their committee to present their plan for completing their doctoral research. The purpose of the dissertation proposal meeting is to allow the committee to provide feedback to the student on their plan of research. This meeting typically takes place during year 3.

DOCTORAL DISSERTATION & FINAL ORAL EXAMINATION

All Ph.D. candidates must submit a thesis embodying the results of research and presenting evidence of originality and ability in independent investigation. The thesis must constitute a valid

knowledge in the field of study and must be based on the candidate's own investigation, including one or more of the following elements:

- Contribution to theory,
- Development of new method for scientific investigation,
- Generation of new scientific data which clearly contribute to the development of sciences, and
- Development and/or novel implementation of a numerical model.

The thesis must reflect a mastery of the literature of the subject and be written in scientific format. The preparation of an acceptable thesis will require at least one full-time academic year. The booklet, Thesis Guide: Preparing a Thesis or Dissertation at OSU, is available electronically on the Web at <http://gradschool.oregonstate.edu/success/thesis-guide>.

The results from studies conducted using human subjects without obtaining Institutional Review Board approval shall not be used to satisfy master's thesis or doctoral dissertation requirements. For more information, please send an email to irb@oregonstate.edu or visit the IRB website at <http://oregonstate.edu/research/irb/>.

After completion of or while concurrently registered for all work required by the program, the student must pass a final oral examination. The final oral examination **must be scheduled in the Graduate School not less than two weeks prior** to the date of the examination. The oral final examination should be scheduled for at least two hours. The Graduate Program Coordinator must also be notified for announcement in the School of Chemical, Biological, and Environmental Engineering no less than two weeks prior to the examination date.

The initial portion of the final oral examination is open to all interested persons. After the open portion of the exam, the examining committee excludes all other persons and continues with the examination of the candidate's knowledge of his or her field. The committee then votes on whether or not the student should pass. If more than one negative vote is recorded by the examining committee, the candidate has failed the examination. Only one re-examination is permitted.

The final oral examination must be taken within five years after the oral preliminary examination. If more than five years elapse, the candidate is required to take another oral preliminary examination. When scheduling their final oral examinations, doctoral students are **required to submit** the pretext pages of their dissertations to the Graduate School **at least two weeks prior to the final oral examination**. Pretext pages include the abstract, copyright (optional), title page, approval page, acknowledgment page, contribution of authors, table of contents, list of figures, tables, appendices, dedication (optional), and preface (optional). It is expected that students will distribute examination copies of their dissertation to all committee members, including the Graduate Council representative, sufficiently early to permit thorough review of the thesis prior to the student's final oral examination.

Within six weeks after the final oral examination or before the first day of the following term, whichever comes first, students must upload one PDF copy of the thesis, without signatures, electronically to ScholarsArchive and submit the signed ETD submission approval form with a copy of the title page to the Graduate School. Signatures on the ETD submission approval form can be electronic, signed, scanned and emailed or faxed. If final submission occurs after the initial six-week period, the student may be subject to re-examination. Please refer to the Graduate School's website for complete details. Within **six weeks** of the final oral examination, one printed copy your thesis must be submitted to the

School of CBEE main office for binding and archiving in the CBEE thesis library.

RE-EXAMINATION

The candidate is expected to defend their thesis during the final oral exam and show a satisfactory knowledge of his or her field. If more than one negative vote is recorded by the examining committee, the candidate has failed the examination. **Only one re-examination is permitted.**

PROCEDURES LEADING TO THE DOCTORAL DEGREE

On the following page is a brief list of the steps required to obtain the Ph.D. degree. You should also become familiar with the specific and detailed information contained in the Graduate School Catalog as well as School requirements.

Procedures for PhD Students

| Check Box | Item # | Step | Timing |
|-----------|--------|---|---|
| | 1 | Identify a Major Professor (research advisor) | By the end of the 1st term |
| | 2 | Select a committee with the help of your advisor | By the end of your first academic year (ideally during winter term) |
| | 3 | Generate Grad Council Rep (GCR) list ; and contact those people until you find someone willing to serve as your GCR | |
| | 4 | Schedule doctoral program meeting with all committee members and reserve a room | |
| | 5 | Doctoral program meeting: Print GCR Checklist and take to the meeting | |
| | 6 | File Doctoral Program of Study | |
| | 7 | Schedule the Preliminary Oral Examination with your committee and reserve a room | AT LEAST 2 weeks prior to preliminary oral examination |
| | 8 | Review Preliminary Oral Examination scoring guide | |
| | 9 | Complete and Submit Exam Scheduling Form | |
| | 10 | Complete preliminary oral examination | Spring Term, Second Year |
| | 11 | Hold a Dissertation Proposal meeting with your committee | By the end of year 3 |
| | 12 | Hold regular meetings with your Committee to keep them updated on your progress | Throughout your degree progression (at least once a year) |
| | 13 | Read the Thesis Guide on the Grad School's website | Prior to starting your dissertation |
| | 14 | Compare Doctoral Program of Study form and transcripts for consistency | 1 term before your intended graduation term |
| | 15 | File Petition to Change Program form if needed. | |
| | 16 | File a Diploma Application | 15 weeks prior to final oral examination |
| | 17 | Complete final draft of your dissertation and submit it to your major professor for review and approval | By the start of your last term |
| | 18 | Schedule the final oral examination with your committee and reserve a room | AT LEAST 2 weeks prior to final oral examination |
| | 19 | Submit final oral examination announcement to Graduate Program Coordinator for circulation | |
| | 20 | Review final oral examination scoring guide | |
| | 21 | Complete Exam Scheduling Form | |
| | 22 | Submit dissertation pretext pages to the Graduate School | |
| | 23 | Submit a final draft dissertation to all committee members (with advisor's approval) | |
| | 24 | Confirm final oral examination appointment with the Grad School (make sure it's on their calendar!) | 1 week after submitting exam scheduling form |
| | 25 | Remind (e-mail) Committee of the final oral examination | 2 days prior to final oral examination |

| | | | |
|--|----|---|--|
| | 26 | Complete final oral examination | NO EARLIER THAN 1 term after passing preliminary oral examination |
| | 27 | Submit final copies (See Submission Instructions) | Within 6 weeks of the exam or by the first day of the next term, whichever is first; <i>if you miss the deadline, you will be required to register for an additional 3 credits, no exceptions!</i> |
| | 28 | Print copy of dissertation for School binding; submit to CBEE Office Coordinator. | |
| | 29 | Graduate School Survey will be emailed to you. If you complete it a gift will be mailed to you. | A month after graduation |

NOTES ABOUT THE CHECKSHEET

- Give yourself and your committee members a lot of time to plan for the defense date. Sometimes committee members will be on sabbatical leave during the term in which you plan to defend. You should check with your committee members about such leaves far in advance to better plan, especially if you need to change a committee member for any reason. Note that your GCR must attend all meetings and examinations during your degree program.

- The Diploma Application must be filed no later than week two of the term in which you defend. However, completion of the form a term or two early is OK. If you need to change your end term after you file a Diploma Application, simply fill out the application again.

- When you confirm your defense exam date with the Graduate School, you are making sure your exam is on their calendar. If they are not aware of your defense date, even if you filled out all the paperwork, you will not be allowed to defend and will have to reschedule.

MASTER'S DEGREE PROGRAMS

The Bioengineering program offers two types of master's degrees:

- Master of Engineering (MEng)
- Master of Science (MS)

The MS degree includes a research project and a thesis, while the MEng provides students the opportunity to pursue advanced-level study without the requirement for a research thesis. MEng degrees are intended as terminal degrees, not as preparation for a doctorate, and will emphasize job-related knowledge and skills. Although not required, students wishing to pursue a PhD in the future are advised to pursue an MS degree, not the MEng.

In addition to the requirements listed in the Graduate School Catalog (<http://catalog.oregonstate.edu/>), the CBEE School has policies listed below regarding the course of study for each Master's degree.

MASTERS OF SCIENCE (MS)

MS students must take a total of 45 graduate credits and 12 of those credits must be thesis credits (BIOE 503). At least 27 credits of non-blanket courses are required. At least half of the non-blanket courses must be graduate stand-alone courses. The remaining courses can be the 500 component of 400/500 slash courses. Note: blanket courses are courses with a zero as the second number, e.g., CBEE 507. Thesis credits (BIOE 503) do not count as blanket credits.

A program of study form must be approved by the student's committee and filed with the graduate school by completion of the second term. The program of study defines the student's path to completion of coursework, and, once approved, it becomes the obligation of the student to complete the requirements as formulated.

THESIS DEFENSE COMMITTEES (MS STUDENTS)

The principal authority over a student's program resides with the student's Master's Committee. This committee is responsible for assuring that University and School requirements are satisfied and administering the final oral examination. The Committee consists of at least 4 members:

- the student's major professor;
- one other BIOE faculty member;
- the student's minor professor, or if no minor is selected, committee member may be from graduate faculty at-large; and
- the Graduate Council Representative.

The committee is originally formed, with approval from the major professor, at the student's invitation. The Graduate Council Representative is selected from a list generated by the [online GCR list generation tool](#). The GCR is required to attend the final examination (thesis defense).

MASTER'S THESIS (MS STUDENTS)

The thesis demonstrates the student's mastery of knowledge in his/her chosen field. It must present innovative research or a novel application of a known methodology to appropriate problems. A conscientious survey of pertinent literature is a prerequisite to an acceptable thesis. The research topic must be approved by the major professor, and the research title must be registered with the Graduate School.

MS candidates must complete a final oral comprehensive examination, which includes a thesis research presentation and defense and questions on pertinent academic subjects. The student cannot schedule a defense exam with the Graduate School until the major professor approves the thesis for distribution to all committee members. Once approved, the student must submit a copy of the thesis to each committee member and complete the [Exam Scheduling Form](#) with the Graduate School at least two weeks prior to the intended defense date.

PROCEDURES LEADING TO THE MS DEGREE

On the following page is a brief list of the steps required to obtain the M.S. degree. You should also become familiar with the specific and detailed information contained in the Graduate School Catalog as well as School requirements.

| PROCEDURES FOR MS STUDENTS | | | |
|----------------------------|--------|---|--|
| Check Box | Item # | Step | Timing |
| | 1 | Choose an advisor and a general thesis topic | By the end of your first term |
| | 2 | Select a committee with the help of your advisor | By completion of second term |
| | 3 | Generate Grad Council Rep (GCR) list ; and contact those people until you find someone willing to serve as your GCR | |
| | 4 | File a Masters Program of Study form | |
| | 5 | Read the Thesis Guide on the Grad School's website | Prior to starting your thesis |
| | 6 | Notify your major professor and committee of your intended graduation term | AT LEAST 1 term before your intended graduation term |
| | 7 | Compare your Program of Study and transcripts for consistency | |
| | 8 | File Petition to Change Program form if needed | |
| | 9 | Confirm submission of your approved Program of Study with Graduate School | 15 weeks prior to final oral examination |
| | 10 | File a Diploma Application | |
| | 11 | Review rubric used for evaluating final MS exams | |
| | 12 | Complete final draft of your thesis, and submit it to your advisor for review and approval | By the start of your last term |
| | 13 | Decide on a day and time (at least 2 hours) for your final exam with all Committee members | AT LEAST 2 weeks prior to final oral examination |
| | 14 | Reserve a room with CBEE Office Coordinator | |

| | | |
|----|--|--|
| 15 | Fill out Exam Scheduling Form | |
| 16 | Submit thesis pretext pages to the Graduate School | |
| 17 | Submit a final draft of the thesis to all committee members (with advisor's approval) | |
| 18 | Submit final oral examination appointment to Graduate Program Coordinator for announcement circulation | |
| 19 | Remind (e-mail) Committee of the final oral examination | 2 days prior to final oral examination |
| 20 | Final oral examination | |
| 21 | Print Electronic Thesis and Dissertation Form , obtain signature, and submit final thesis paperwork (See Submission Instructions) | Within 6 weeks of the exam or by the last day of the current term, whichever is first; <i>if you miss the deadline, you may be required to register for an additional 3 credits.</i> |
| 22 | Print copy of thesis for School binding; submit to CBEE Office Coordinator. | |
| 23 | Graduate School Survey will be emailed to you. If you complete it a gift will be mailed to you. | A month after graduation |

MASTERS OF ENGINEERING (MENG)

MEng students must take a total of 45 graduate credits. Thesis credits cannot be used and blanket credits are limited to a maximum of 9. Thus, at least 36 credits of non-blanket coursework is required. At least half of the non-blanket courses must be graduate stand-alone courses. The remaining courses can be the 500 component of 400/500 slash courses. Note: blanket courses are courses with a zero as the second number, e.g., CBEE 507.

A program of study form must be approved by the student's advisor and filed with the graduate school by completion of the second term. The program of study defines the student's path to completion of coursework, and, once approved, it becomes the obligation of the student to complete the requirements as formulated.

MEng students will be assigned an advisor by the Graduate Program Coordinator at the start of their first term in residence. All questions regarding the program and curriculum should be first directed to the assigned advisor. If the assigned advisor is unresponsive or the student has unanswered questions, they should consult the Graduate Program Coordinator.

MENG PORTFOLIO (MENG STUDENTS)

The MEng portfolio demonstrates the student's mastery, synthesis, and communication of subject matter knowledge in the context of the student's professional goals. It serves as the culmination of the MEng program and final examination for the MEng degree. MEng students will assemble their portfolio in their last term of residence as part of the course ENGR 599/521. The final portfolio will be assessed by both the course instructor and the student's academic advisor according to the rubric that will be provided to you by College of Engineering MEng Coordinator, Anita Hughes. Briefly, the aim of the portfolio is to highlight the following three elements:

- a. A statement of the candidate's professional goals for obtaining the MEng degree;
- b. An overview of how the MEng coursework, including both major and minor areas, provided the preparation needed to achieve the candidate's professional goals;
- c. A highlight of examples from class projects, homework, job search efforts, etc., that illustrate and elaborate on item b.

Additionally, the portfolio should demonstrate attainment of the program's three graduate learning outcomes.

PROCEDURES LEADING TO THE MENG DEGREE

On the following page is a brief list of the steps required to obtain the M.Eng. degree. You should also become familiar with the specific and detailed information contained in the Graduate School Catalog as well as School requirements.

PROCEDURES FOR MENG STUDENTS

| Check Box | Item # | Step | Timing |
|-----------|--------|---|--|
| | 1 | Be assigned a major professor | By the end of your first term |
| | 2 | File a Masters Program of Study form | By the completion of second term |
| | 3 | Register for ENGR 599/521 Portfolio Completion | Final term in residence |
| | 4 | Compare Program of Study form and transcripts for consistency | Completed in ENGR 599/521: Portfolio Completion course |
| | 5 | File Petition to Change Program form , if needed | |
| | 6 | Review CBEE Graduate Learning Outcomes rubric used for evaluating final exams | |
| | 7 | Confirm submission of your approved Program of Study with Graduate School | |
| | 8 | File a Diploma Application | |
| | 9 | Fill out Exam Scheduling Form | As directed in ENGR 599/521 course |
| | 10 | Submit final draft of MEng Portfolio to MEng Coordinator, Anita Hughes | Using timeline within ENGR 599/521 |
| | 12 | Graduate School Survey will be emailed to you. If you complete it a gift will be mailed to you. | A month after graduation |

Appendices

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Oregon State University
School of Chemical, Biological and Environmental Engineering
Student/Advisor Memorandum of Understanding

_____ and _____
Advisor Student:

The purpose of this Memorandum of Understanding is to clearly identify the Advisor/Student relationship for members of the graduate program in CBEE and to identify the initial expected source of funding (if any).

By filling and signing this form, the Student and Advisor parties agree to work together towards an MS / PhD (cross off one) degree by the Student.

At the time of signing, the Student is Self Funded / offered funding at _____ FTE from _____ starting on _____ (cross off one). It is mutually understood that renewal of any offer of funding in future terms is at the discretion of the Advisor and contingent on availability of funds. The Advisor will discuss the funding situation with the Student in a timely fashion to enable the Student to make alternative financial arrangements as necessary.

Student Signature

Date

Advisor Signature

Date

Appendix: Student and Advisor responsibilities

A healthy and fruitful relationship helps both the Advisor and the Student and forms the foundation of a career-long beneficial relationship. The set of general guidelines below explaining the expected responsibilities on both parts is intended to help establish such relationships.

Advisor(s) Responsibilities

- The Advisor will maintain a respectful and professional relationship with the Student.
- The Advisor is neither the Student's best friend, nor his opponent – the Advisor's responsibility is to help the Student be successful by providing opportunities and guidance in coursework selection and research. These opportunities include access to a clean, safe, and well-equipped work environment; opportunities for publications and professional presentations, and supplying accurate and objective references for potential employers.
- The Advisor will ensure that coursework and research are up to the high standards of graduate engineering education at OSU and that qualifying, preliminary, and/or final exams are fair. If there are concerns about the quality of the Student's coursework or research, the Advisor will step in to discuss possible options and remedies.
- The Advisor will give high-level direction research work but it is the Student's responsibility to conceive and implement the day-to-day tasks necessary to move the research forward.
- The Advisor does not have an obligation to provide funding to the Student but will strive to provide funding opportunities whenever possible.

Student Responsibilities

- The Student is expected to treat the Advisor with respect and address them formally, be respectful of other students, and help create a positive environment in the research group, the School and the University.
- It is the Student's responsibility to plan the program of study that meets the degree program and University requirements regarding number and types of credits needed for graduation with input from the Advisor. To achieve this, the Student should prepare a draft of the Program of Study (see http://oregonstate.edu/dept/grad_school/forms.php#program) by the end of the Student's first term working with the Advisor and discuss options. It is also the Student's responsibility to be aware of key dates and requirements for qualifying exams, program meetings, preliminary exams, and/or final exams.
- When research funding is offered the Advisor and Student will attempt to reconcile the research topic desires of the student with the needs of the funding source – generally, there is sufficient freedom to tailor the research toward the student's areas of interest. If the Student is unsatisfied with the research topic, it is the Student's responsibility to raise this concern with the Advisor. The Student always has the option of rejecting funding. However, once a commitment is made, the Student is expected to meet targets as deemed reasonable and agreed upon with the Advisor.
- It is the Student's responsibility to stay in contact with the Advisor and ensure the Advisor is current on research progress. For the purpose, the Student should take the initiative to schedule any meetings with the Advisor to discuss research questions or issues.
- The Student is expected to take ownership the research project and to bring energy, enthusiasm, and innovation to the project. In the end, the thesis must contain many of the Student's ideas and results interpretation. The time spent in the development of the research project should be in addition to any paid professional commitments contracted by the Student (e.g., beyond a GRA or GTA offer, if any).

M.Eng. Degree Curriculum in Bioengineering

| Year 1 | | |
|--|-------------------------------------|--|
| Fall | Winter | Spring |
| CBEE 507 Grad Seminar Prof. Dev. AND ENGR 599/520 MENG Portfolio Prep 2 cr | | ENGR 599/521 MENG Portfolio Completion 1 cr |
| BIOE 512 Modeling of Physiological Systems 4 cr | Grad Minor or Elective 3-4 cr | BIOE 513 Drug & Medical Device Regulations in Tech Dev 2 cr |
| Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | BIOE 511 Cellular and Molecular Bioengineering 3 cr |
| Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr |
| Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr |
| TOTAL | 16 | 15 |

Notes: **BIOE Core (12 cr): CBEE 507(1), ENGR 520/521(2), BIOE 511, BIOE 512, BIOE 513**
**CBEE 507 Seminar: Professional Development is required for MEng students in the Fall term. For MEng students, ENGR 599/520 MENG Portfolio Prep and ENGR 599/521 MENG Portfolio Completion classes total the 3 required seminar credits.*

Electives (**33 cr**): Any graduate-level course, typically 4-5 courses. These are the most flexible credits.
 (Note, a grad minor typically requires 15 credits of courses from the minor field.)

M.S. Degree Curriculum in Bioengineering

| | Year 1 | | | Year 2 | | |
|--------------|--|--|--|--|--|--|
| | Fall | Winter | Spring | Fall | Winter | Spring |
| | CBEE 507 Grad Seminar Prof. Dev. 1 cr | CBEE 507 Grad Seminar Prof. Dev. 1 cr | CBEE 507 Grad Seminar Prof. Dev. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Presentation 1 cr |
| | BIOE 512 Modeling of Phys Systems 4 cr | Grad Minor or Elective 3-4 cr | BIOE 513 Drug & Med Device Regs in Tech Dev 2 cr | Grad Minor or Elective 3-4 cr | | |
| | Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | BIOE 511 Cell & Molecu BioE 3 cr | | BIOE 503 MS Thesis Variable 1-12 cr | BIOE 503 MS Thesis Variable 1-12 cr |
| | Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | BIOE 503 MS Thesis Variable 1-12 cr | | |
| TOTAL | 12 | 12 | 12 | 12 | 12 | 12 |

Notes: **BIOE Core (12 cr): CBEE 507, BIOE 511, BIOE 512, BIOE 513**

CBEE 507 Professional Development Seminar is required for all 3 terms. Students are requested to enroll in CBEE 507 Presentation seminar.

M.S. Thesis (12 cr): variable credits, thesis credits can go over 12 units total to meet GTA/GRA requirements.

Graduate Minor/Elective (21 cr): Any graduate-level course, typically 4-5 courses. These are the most flexible credits. A graduate minor typically requires 15 credits of courses from the minor field.

Year 2: completion time is dependent upon intensity of project.

45 Total Credits required

PhD. Degree Curriculum in Bioengineering

| Year 1 | | | Year 2 | | | Year 3-6 | | |
|--|---|--|---|---|---|---|---|---|
| Fall | Winter | Spring | Fall | Winter | Spring | Fall | Winter | Spring |
| CBEE 507 Grad Seminar Prof. Dev. 1 cr | CBEE 507 Grad Seminar Prof. Dev. 1 cr | CBEE 507 Grad Seminar Prof. Dev. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Present. 1 cr | CBEE 507 Grad Seminar Present. 1 cr |
| BIOE 512 Modeling of Phys Systems 4 cr | Grad Minor or Elective 3-4 cr | BIOE 513 Drug & Med Device Regs in Tech Dev 2 cr | Grad Minor or Elective 3-4 cr | | | | | |
| Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | BIOE 511 Cell & Molecu BioE 3 cr | BIOE 603 PhD Thesis Variable 1-12 cr | BIOE 603 PhD Thesis Variable 1-12 cr | BIOE 603 PhD Thesis Variable 1-12 cr | BIOE 603 PhD Thesis Variable 1-12 cr | BIOE 603 PhD Thesis Variable 1-12 cr | BIOE 603 PhD Thesis Variable 1-12 cr |
| Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | Grad Minor or Elective 3-4 cr | | | | | | |
| TOTAL | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |

Notes **BIOE Core (12 cr): CBEE 507, BIOE 511, BIOE 512, BIOE 513**

CBEE 507 Seminar is required for all 3 terms. Students are requested to enroll in CBEE 507, Seminar, Presentations, each term.

Ph.D. Thesis (36 cr): variable credits, thesis credits can go over 36 units total to meet GTA/GRA requirements.

Graduate Elective (15+ cr): Any graduate-level course, typically 4-5 courses. These are the most flexible credits. A graduate minor typically requires 15 credits of courses from the minor field.

Year 3-6: completion time is dependent upon intensity of project and credits are based on funding/coursework

108 Total Credits required

Doctoral Deliverables Timeline

Oregon State University
School of Chemical, Biological, and Environmental Engineering
Ph.D. Timeline
Version 09-20-2018

| Year | Term | Task |
|-------------------|--------|---|
| 1 st | Fall | Attend Graduate Orientation |
| 1 st | Fall | Complete Lab Visits/Rotations |
| 1 st | Winter | Complete Major Professor Selections |
| 2 nd | Winter | Submit Program of Study |
| 2 nd | Spring | Complete Oral Preliminary Exam |
| 3 rd | Winter | Present Poster at Graduate Open House |
| 4 th | | Present research in Graduate Seminar (CBEE 507) |
| 5 th + | | Defend thesis |

**Scoring Guide (Rubric) for Graduate Learning Outcome Assessment
M.S. THESIS and FINAL ORAL EXAM in BIOENGINEERING**

Candidate Name: _____ Date: _____

Title of Examination Document: _____

Name of the Examining Committee Member: _____

| Criteria | Does Not Pass Exam | Passes Exam | |
|---|---|---|---|
| | Unsatisfactory | Satisfactory | Exemplary |
| 1a. Research Hypothesis and Objectives | Research problem not clearly stated, or statement not carefully considered and hypothesis driven; Research plan to investigate solution to the defined problem is not fully considered; Measurable technical outcomes not described. | Research problem clearly stated and hypotheses behind research activities identified; Research plan to investigate solution to the defined problem adequately considered; Measurable technical outcomes described. | Research problem fully considered and hypotheses behind all research questions clearly enunciated with broader impacts in the field identified; Research plan to investigate solution to the defined problem fully considered; Measurable technical outcomes described and significance of likely measurements discussed. |
| 1b. Literature Review | The review belies a summative approach, with information presented in a disconnected, disjointed manner and not clearly tied to the research; widely known technical references clearly missing or cites references not germane to the topic at hand. | The information is organized by themes that are related; Ideas are explored as the writing attempts to take an expert approach. However, some themes may be disconnected; some references known to experts in the field may be missing. | The information is clearly synthesized into themes. The writing demonstrates an expert approach by illustrating the relationship between themes, concepts, and ideas reported in the literature, and links these themes to the focus of the research. References are complete. |
| 2. Ability to Demonstrate a Creative Solution to the Problem | Proposed concept is well known, previously described in technical literature, or is impossible/illogical. | Proposed work is original and possible but derivative/incremental in nature. | Proposed work is original, practical and demonstrates a novel approach. |
| 3. Application of Science and Engineering Fundamentals | Science/Engineering principles underlying Research Hypothesis and Objectives not clearly identified. Lack of awareness of assumptions and limitations. | Science/Engineering principles underlying Research Hypothesis and Objectives identified and discussed. Major assumptions clearly stated. | Science/Engineering principles underlying Research Hypothesis and Objectives identified and discussed. Major assumptions clearly stated; as appropriate math models and associated predictions developed. |
| 4a. Quality of Written Communication | Writing style is immature. Profuse grammatical errors, poor sentence construction and/or poor document structuring make it laborious to read. | Writing style is academic and flows by presenting information in a concise manner. There are only minor grammatical and spelling errors. | Writing style is scholarly and flows naturally, presenting information in a clear and precise manner. Voice is active and devoid of bias. No grammar or spelling errors. |
| 4b. Quality of Oral Communication | Disorganized presentation with low original content; Excessively poor communication skills; Answers to questions show weakness in depth of knowledge in subject matter and/or poor critical thinking skills. | Adequately organized presentation where concepts flow logically; Adequate communication skills; Answers show adequate knowledge in subject area and adequate critical thinking skills. | Highly engaging conference quality presentation; Excellent communication skills; Answers show superior knowledge in subject area and well developed critical thinking skills. |

Preliminary Exam Scoring Rubric – PhD Bioengineering

**Scoring Guide (Rubric) for Graduate Learning Outcome Assessment
PhD PRELIMINARY ORAL EXAM in BIOENGINEERING**

Candidate Name: _____ Date: _____

Title of Examination Document: _____

Name and Signature of the Examining Committee Member: _____

| Criteria | Does Not Pass Exam | Passes Exam | |
|---|---|---|---|
| | Unsatisfactory | Satisfactory | Exemplary |
| 1a. Research Hypothesis and Objectives | Research problem not clearly stated, or statement not carefully considered and hypothesis driven; Research plan to investigate solution to the defined problem is not fully considered; measurable technical outcomes not described | Research problem clearly stated and hypotheses behind research activities identified; Research plan to investigate solution to the defined problem adequately considered; measurable technical outcomes described | Research problem fully considered and hypotheses behind all research questions clearly enunciated with broader impacts in the field identified; Research plan to investigate solution to the defined problem fully considered; measurable technical outcomes described and significance of likely measurements discussed |
| 1b. Literature Review | The review belies a summative approach, with information presented in a disconnected, disjointed manner and not clearly tied to the research; widely known technical references clearly missing or cites references not germane to the topic at hand. | The information is organized by themes that are related; Ideas are explored as the writing attempts to take an expert approach. However, some themes may be disconnected; some references known to experts in the field may be missing. | The information is clearly synthesized into themes. The writing demonstrates an expert approach by illustrating the relationship between themes, concepts, and ideas reported in the literature, and links these themes to the focus of the research. References are complete. |
| 2. Ability to Demonstrate a Creative Solution to the Problem | Proposed concept is well known to be described in technical literature or is impossible/illogical | Proposed work is original and possible but derivative/incremental in nature | Proposed work is original, practical and demonstrates a novel approach |
| 3. Application of Science and Engineering Fundamentals | Science/Engineering principles underlying Research Hypothesis and Objectives not clearly identified. Lack of awareness of assumptions and limitations. | Science/Engineering principles underlying Research Hypothesis and Objectives identified and discussed. Major assumptions clearly stated. | Science/Engineering principles underlying Research Hypothesis and Objectives identified and discussed. Major assumptions clearly stated; as appropriate math models and associated predictions developed. |
| 4a. Quality of Written Communication | Writing style is immature. Profuse grammatical errors, poor sentence construction and/or poor document structuring make it laborious to read. | Writing style is academic and flows by presenting information in a concise manner. There are only minor grammatical and spelling errors. | Writing style is scholarly and flows naturally, presenting information in a clear and precise manner. Voice is active and devoid of bias. No grammar or spelling errors. |
| 4b. Quality of Oral Communication | Disorganized presentation with low original content; Excessively poor communication skills; Answers to questions show weakness in depth of knowledge in subject matter and/or poor critical thinking skills. | Adequately organized presentation where concepts flow logically; Adequate communication skills; Answers show adequate knowledge in subject area and adequate critical thinking skills | Highly engaging conference quality presentation; Excellent communication skills; Answers show superior knowledge in subject area and well developed critical thinking skills |

**Scoring Guide (Rubric) for Graduate Learning Outcome Assessment
Ph.D. THESIS and FINAL ORAL EXAM in BIOENGINEERING**

Candidate Name: _____ Date: _____

Title of Examination Document: _____

Name of the Examining Committee Member: _____

| Criteria | Does Not Pass Exam | Passes Exam | |
|---|---|---|---|
| | Unsatisfactory | Satisfactory | Exemplary |
| 1a. Research Hypothesis and Objectives | Research problem not clearly stated, or statement not carefully considered and hypothesis driven; Research plan to investigate solution to the defined problem is not fully considered; Measurable technical outcomes not described. | Research problem clearly stated and hypotheses behind research activities identified; Research plan to investigate solution to the defined problem adequately considered; Measurable technical outcomes described. | Research problem fully considered and hypotheses behind all research questions clearly enunciated with broader impacts in the field identified; Research plan to investigate solution to the defined problem fully considered; Measurable technical outcomes described and significance of likely measurements discussed. |
| 1b. Literature Review | The review belies a summative approach, with information presented in a disconnected, disjointed manner and not clearly tied to the research; widely known technical references clearly missing or cites references not germane to the topic at hand. | The information is organized by themes that are related; Ideas are explored as the writing attempts to take an expert approach. However, some themes may be disconnected; some references known to experts in the field may be missing. | The information is clearly synthesized into themes. The writing demonstrates an expert approach by illustrating the relationship between themes, concepts, and ideas reported in the literature, and links these themes to the focus of the research. References are complete. |
| 2. Ability to Demonstrate a Creative Solution to the Problem | Proposed concept is well known, previously described in technical literature, or is impossible/illogical. | Proposed work is original and possible but derivative/incremental in nature. | Proposed work is original, practical and demonstrates a novel approach. |
| 3. Application of Science and Engineering Fundamentals | Science/Engineering principles underlying Research Hypothesis and Objectives not clearly identified. Lack of awareness of assumptions and limitations. | Science/Engineering principles underlying Research Hypothesis and Objectives identified and discussed. Major assumptions clearly stated. | Science/Engineering principles underlying Research Hypothesis and Objectives identified and discussed. Major assumptions clearly stated; as appropriate math models and associated predictions developed. |
| 4a. Quality of Written Communication | Writing style is immature. Profuse grammatical errors, poor sentence construction and/or poor document structuring make it laborious to read. | Writing style is academic and flows by presenting information in a concise manner. There are only minor grammatical and spelling errors. | Writing style is scholarly and flows naturally, presenting information in a clear and precise manner. Voice is active and devoid of bias. No grammar or spelling errors. |
| 4b. Quality of Oral Communication | Disorganized presentation with low original content; Excessively poor communication skills; Answers to questions show weakness in depth of knowledge in subject matter and/or poor critical thinking skills. | Adequately organized presentation where concepts flow logically; Adequate communication skills; Answers show adequate knowledge in subject area and adequate critical thinking skills. | Highly engaging conference quality presentation; Excellent communication skills; Answers show superior knowledge in subject area and well developed critical thinking skills. |

**Evaluated Graduate Learning Objectives/Outcomes for PhD, MS, and MEng Programs
Chemical Engineering, College of Engineering**

| PhD Outcomes | MS Outcomes | MEng Outcomes |
|--|---|--|
| <p>Outcome 1: Demonstration of Scholarship The student will be able to identify and conduct original research resulting in a significant contribution to knowledge in the fields spanned by Chemical, Biological and Environmental Engineering. (CBEE) and to effectively communicate this work to a technically literate audience. This will be assessed using the PhD Qualifier Examination, PhD Thesis and Final Oral Examination (“Defense”).</p> | <p>Outcome 1: Demonstration of Scholarship The student will be able to conduct original research and assemble a creative new body of work in the fields spanned by CBEE and to effectively communicate this work to a technically literate audience. This will be assessed using the MS Thesis and Final Oral Examination.</p> | <p>Outcome 1: Demonstration of Scholarship The student will be able to assemble a capstone portfolio synthesizing aspects of core knowledge in the fields spanned by CBEE and to effectively communicate this work to a technically literate audience. This will be assessed using the M.Eng. Final Portfolio Exam.</p> |
| <p>Outcome 2: Mastery of Subject Material The student will be able to think critically, creatively and to address technical problems in CBEE. This will be assessed through satisfactory completion of the graduate program of study.</p> | <p>Outcome 2: Mastery of Subject Material The student will be able to think critically, creatively and to address technical problems in CBEE. This will be assessed through satisfactory completion of the graduate program of study.</p> | <p>Outcome 2: Mastery of Subject Material The student will be able to think critically, creatively and to address technical problems in CBEE. This will be assessed through satisfactory completion of the graduate program of study.</p> |
| <p>Outcome 3: Ethical Conduct Students will be educated in ethical and responsible conduct in research and professional activities. This will be assessed through satisfactory completion of the graduate seminar (CBEE507).</p> | <p>Outcome 3: Ethical Conduct Students will be educated in ethical and responsible conduct in research and professional activities. This will be assessed through satisfactory completion of the graduate seminar (CBEE507).</p> | <p>Outcome 3: Ethical Conduct Students will be educated in ethical and responsible conduct in professional activities. This will be assessed through satisfactory completion of the graduate seminar (CBEE507).</p> |

Safety Training Template

CBEE Graduate Student EH&S Lab Safety Training

Student Name:

Date:

Student ID #:

Video title:

Written summary of the important concepts and information in this video:

CBEE Graduate Degree Programs Graduate Student Academic Progress

The process for evaluating Academic Progress for graduate students in the School of CBEE **may** include 4 steps (in chronological order through academic year):

- **1. Planning Ahead** (complete within first term, revised as necessary at end of AY) - *page 3 of this document*
- **2. Graduate Competency List** (complete within first term, revise as necessary at end of each AY) - *page 5*
- **3. Assessment of Progress on Milestones** (due at end of each AY) - *page 6-8*
- **4. Graduate Education Performance Plan** (following an unsatisfactory assessment) - *page 9 of this document*

Definition of Satisfactory Academic Progress

Satisfactory progress toward completing a graduate degree in CBEE graduate programs requires:

- An annual written assessment showing adequate progress in coursework, development of thesis or writing project as evaluated by major professor and the rest of the student's graduate committee;
- Maintaining a GPA of 3.00 or better for all courses taken as a graduate student;
- Successfully passing relevant exams outlined by the Graduate School and the CBEE program,
- Timely* compliance with all Graduate School and programmatic requirements** for committee formation, committee meetings, project proposal, submission of forms and information, participation in seminars and other activities expected of a student, scholar and citizen.

**Students who are restricted from full course loads may negotiate a longer time frame in consultation with the Associate School Head for Graduate Programs and their major professor.*

***Students with overdue program materials may have holds placed on their registration by the Graduate School and may not be eligible for funding opportunities such as the Laurels Block Grant Scholarship, COE Fellowships, and COE School level Awards.*

Plan for Assessment of Graduate Student Satisfactory Academic Progress

- Early in their program (e.g., during their third term of enrollment) students should collaborate with their major professor and graduate committee to establish standards and expectations of satisfactory progress for that student's program.
- Student progress will be assessed annually.
- An assessment of student academic progress is made by the student, the student's major professor and, if requested, by other members of the student's graduate committee. Any member of the committee may write an evaluation of student progress for inclusion in the assessment package, but this is optional.
- It is the responsibility of the student to write a self-assessment narrative, arrange to meet with their major professor to review academic progress, and to submit the assessment package to the Graduate Coordinator no later than June 30th each year. The assessment package consists of the self-assessment narrative, any assessments written by committee members, and the signed and completed Assessment of Graduate Student Academic Progress form.

Process:

1. Each spring term, every graduate student in a CBEE graduate program will fill out the 'Completion of Milestones' section of the 'Assessment of Graduate Student Academic Progress' form (Pg 6 of this document) and attach a written self-assessment narrative. The student may want to discuss their advisor's expectations for various categories of progress or professional development prior to writing the self-assessment.

Self-Assessment Narrative:

The written self-assessment should summarize activities undertaken by the student since the last review and should address:

- a. Progress on course work and timeline for courses remaining to be completed,
 - b. Brief description of research topic and progress made,
 - c. Progress on writing thesis,
 - d. Reflection on goals from previous year
 - e. Participation in career and professional development opportunities
 - f. Goals for the coming year
 - g. Any other relevant information, including any impediments to progress.
2. The student will then schedule a meeting with the major professor to review the student's self-assessment, progress, and accomplishments over the past year. Participation from other graduate committee members may be requested by either the student or the major professor, but is not required. If other committee members provide input the student should obtain their signature on the Assessment of Graduate Student Progress form.
 3. The major professor reviews the student's materials and then fills out and signs the Assessment of Graduate Student Academic Progress form. Although optional, the major professor (or any committee member) is strongly encouraged to document their assessment of the student's progress in writing for inclusion in the assessment. It should be noted that signing the assessment without any written assessment will indicate agreement with the student's written narrative. These written comments may be helpful to document expectations for the coming year. The student signs the form and is responsible for submitting the narrative and the signed and completed Assessment of Graduate Student Academic Progress form to the Graduate Program Coordinator for inclusion in the student's permanent record **by June 30th** each year.

4. If the student's progress is unsatisfactory, the student will work with the major professor to develop a Graduate Education Performance Plan (page 7) that contains measureable milestones for assessing student academic progress over the course of the year. The plan will also be reviewed and signed by the - and filed in the student's permanent record.

1. Planning Ahead for the First Year

Please plan ahead for the coming year in terms of academic milestones, competencies, professional and career development, etc. Use the table for formal academic milestones and the space below for other goals. The idea is that you use this opportunity to plan ahead for the year **with your major professor and committee**, and the assessment is then used to take stock and see how things have progressed.

To Be Filled Out By Student

Student's name: _____ Date: _____
 Date entered CBEE graduate program: _____ Degree program (check one): M.Eng.____
 M.S.____Ph.D.____
 Program: _____ Date of expected completion: _____

Major Professor Name(s):

Committee Member Names:

Checklist: (Complete those that apply to you; please fill in all dates that are applicable even if it's your best guess)

| COMPLETION OF MILESTONES | TIME LINE | DATE COMPLETED OR EXPECTED |
|---|------------------------------|-----------------------------------|
| All Degrees | | |
| Complete of Ethics Requirement (CITI RCR or GRAD 520) | First quarter | |
| Complete laboratory safety training | First quarter | |
| Draft Program of Study | First quarter | |
| M.Eng. Degree | | |
| Establish Graduate Committee | Second quarter | |
| Program of Study submitted to the Grad School | End of Second quarter | |
| Schedule final oral exam | At least 2 week before event | |
| M.S. Degree | | |
| Establish Graduate Committee | Third quarter | |
| Program of Study submitted to the Grad School | By end of year 1 | |

| | | |
|---------------------------------------|---|--|
| Schedule final defense | at least 2 weeks before event | |
| Ph.D. Degree | | |
| Establish Graduate Committee | End of first year | |
| Qualifying Exam | End of Fall term of year 2 | |
| Program of Study Meeting / Submit POS | After passing Qualifying Exam/ by end of 5 th term | |
| Preliminary Exam | End of 2 nd year or after approval of Program of Study and completion of most of course work | |
| Schedule final defense | One quarter before event | |

This completed form must be submitted to the CBEE Graduate Coordinator *before the end of your first term in year 1*. In subsequent years, use the annual academic progress forms (page 5 and 6) that are *submitted by June 30th* each year.

Master's degree flow chart:

http://oregonstate.edu/dept/grad_school/docs/success/Flowchart%20Masters.pdf

PhD degree flow chart: http://oregonstate.edu/dept/grad_school/docs/success/Flowchart%20PhD.pdf

Graduate School Deadlines: <http://gradschool.oregonstate.edu/progress/deadlines>

Please elaborate here on course work, competencies (see page 7), field work, data collection and analysis, conference attendance, publications, thesis chapters, workshop attendance, lab health and safety training, professional and career development events you would like to attend, etc. Anything you and your major professor and/or committee discuss as taking place in the coming academic year. Attach additional pages as necessary.

[...]

CBEE Graduate Degree Programs

2. Graduate Competency List

- **Disciplinary skills and knowledge**
Knowledge of a student's chosen field of study, and closely related fields, including history and trends in major findings, concepts, theories, approaches, and context.
- **Transdisciplinary/interdisciplinary skills and knowledge (biophysical and social sciences)**
Knowledge of the relationship of the a student's field/s of study to social and/or biophysical sciences, and approaches for integration and synthesis during research, outreach, and teaching. For social science students, emphasis is on knowledge of biophysical sciences and how to use them to analyze and interpret information. For biophysical science students, knowledge of social sciences and how to use them to analyze and interpret information.
- **Communication skills (oral, written, pedagogy, professional)**
Ability to write and speak to diverse audiences in an organized and clear fashion about relevant areas of expertise, both disciplinary and inter/transdisciplinary. Ability to modify oral and written communications for specific audiences. Knowledge of contemporary electronic tools for communication, such as for supporting lectures, social media, and blogs.
- **Critical thinking skills**
Ability to evaluate the quality, context, scale, and biases in information, and to synthesize diverse kinds of information, in written and oral forms. Capacity for real-time discussion of biophysical and social systems and their interactions.
- **Research skills (quantitative, qualitative)**
Knowledge sufficient to understand the use of quantitative and qualitative summaries of data as evidence for conclusions and scientific inference. This can include skills and knowledge with statistical, mathematical, graphical and process models sufficient to plan, implement, analyze and interpret research.
- **Research ethics**
Knowledge of processes and guidelines for assuring that research is conducted in socially and professionally acceptable and legal ways, while minimizing and managing conflicts of interest. Topics of relevance may include conduct general ethics, peer review, bias during data analysis and presentation, plagiarism, animal welfare, treatment of human subjects, collaboration, and authorship.
- **Policy analysis/interpretation**
Knowledge of the laws, regulations, social institutions, and governance processes relevant to application of a student's disciplinary and/or inter/transdisciplinary areas of study.
- **Teaching (PhD only)**
Knowledge of contemporary, relevant STEM teaching methods, and experience in their application in classrooms, online, and technical/professional environments. Experience in development of a classroom and/or online course, including development of a course syllabus that includes learning outcomes, lectures, laboratories, student assignments, and evaluation methods.

The **competencies are *not* course requirements**. Rather they can be acquired in a variety of ways. Life experiences, field experiences, extra-curricular activities and independent study are all examples of how a competency could be met. Students and their committees should be discussing how the student meets or will meet them.

CBEE Graduate Degree Programs

3. Assessment of Graduate Student Academic Progress

To be filled out by the student

Student's name: _____ Date: _____
 Date entered CBEE graduate program: _____ Degree program (check one): MEng ___ M.S. ___ Ph.D. ___
 Program: _____ Date of expected completion: _____

Major Professor Name(s):

Committee Member Names:

Checklist: (Complete those that apply to you; please fill in all dates that are applicable even if it's your best guess)

| COMPLETION OF MILESTONES | TIME LINE | DATE COMPLETED OR EXPECTED |
|---|-------------------------------|-----------------------------------|
| All Degrees | | |
| Complete of Ethics Requirement (CITI RCR or GRAD 520) | First quarter | |
| Complete laboratory safety training | First quarter | |
| Draft Program of Study | First quarter | |
| M.Eng. Degree | | |
| Establish Graduate Committee | Second quarter | |
| Program of Study submitted to the Grad School | End of second quarter | |
| Schedule final oral exam | At least 2 week before event | |
| M.S. Degree | | |
| Establish Graduate Committee | Third quarter | |
| Program of Study submitted to the Grad School | By end of year 1 | |
| Schedule final defense | at least 2 weeks before event | |
| Ph.D. Degree | | |
| Establish Graduate Committee | End of first year | |

| | | |
|---------------------------------------|---|--|
| Qualifying Exam | End of Fall term of year 2 | |
| Program of Study Meeting / Submit POS | After passing Qualifying Exam/ by end of 5 th term | |
| Preliminary Exam | End of 2 nd year or after approval of Program of Study and completion of most of course work | |
| Schedule final defense | One quarter before event | |

Progress form

| 2. Major Professor Assessment of Progress: | | |
|--|----|--|
| Major professor(s): Please discuss your responses with your student. | | |
| YES | NO | QUESTION |
| | | Student is making satisfactory progress in completing his/her course work. |
| | | Student is making satisfactory progress in research |
| | | Student is making satisfactory progress in writing of his/her thesis. |
| | | Student has participated in professional and/or career development opportunities |

| 3. Signatures: | | |
|--|--------------|------|
| <i>I have reviewed the student's milestones (above) and self-assessment narrative, have completed the 'Major Professor Assessment of Progress' (left), and confirmed that the student</i> | | |
| | | |
| Major | Professor | Date |
| | | |
| | | |
| | | |
| Committee Member | Signature(s) | Date |
| <i>I understand my major professor(s)' assessment of my progress (left), and am now submitting this fully completed form to the Graduate Coordinator with my self-assessment narrative attached.</i> | | |
| Student | | Date |

This completed form must be attached to the self-assessment narrative and submitted to the CBEE Graduate Coordinator before June 30th each year.

Graduate Student Self-Assessment Narrative

The self-assessment conveys progress since the last assessment cycle and should include the following:

1. Progress on course work and timeline for courses remaining to be completed,
2. Brief description of research topic and progress made,
3. Progress on writing thesis,
4. Reflection on goals from previous year (if any)
5. Participation in career and professional development opportunities
6. Goals for the coming year
7. Any other relevant information, including any impediments to progress.

It is the responsibility of the student to write a self-assessment narrative (attach separate page), arrange to meet with their major professor to review academic progress, and to submit the assessment package to the Graduate Coordinator no later than June 30th each year. The assessment package consists of the self-assessment narrative, any assessments written by committee members, and the signed and completed Assessment of Graduate Student Academic Progress form.

CBEE Graduate Degree Programs

4. Graduate Education Performance Plan

This form is intended to monitor a student's performance towards degree completion **resulting from an unsatisfactory review** at an annual assessment. This form should outline mutually agreed-upon (between student and major professor) benchmarks of performance.

Student _____

Major Professor _____

Plan (Identify deficiencies and outline plan to remedy them):

Benchmarks (Criteria used to evaluate progress):

Signatures

_____ Date _____
Student

_____ Date _____
Major Professor

_____ Date _____
Associate Head for Graduate Programs

CBEE Student Evaluation Process

- 1) Graduate Program Coordinator begins form with first year students as part of Orientation. Discussion of their responsibilities and timelines.

- 2) By the end of Year One, student will be matched with research advisor. Major professor and student finish the First Year information, and plan for year 2, filing the completed assessment (progress form and student narrative by June 30.

- 3) Before the end of Year 2, Major professor and student complete the Assessment, filling in additional milestone dates as completed and the Progress form. Student completes a self-assessment narrative to discuss with major professor and attach to progress form. Assessment, Progress form and Student Self-assessment submitted to Graduate Coordinator by June 30.

- 4) If Student receives an unsatisfactory review during the annual assessment the Performance Plan form constitutes the plan of action to identify deficiencies and correct them. Submitted to the Graduate Program Coordinator by June 30 for the student's permanent file.



| | | | | | | | | | | | | |
|-----------|------------------------------|-----------------------------|-------------------------------|--------------------------------|--------------------------------|--|-----------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|------------------------------|
| Check One | <input type="checkbox"/> EdM | <input type="checkbox"/> MA | <input type="checkbox"/> MAPE | <input type="checkbox"/> MATRN | <input type="checkbox"/> MCoun | <input checked="" type="checkbox"/> MEng | <input type="checkbox"/> MF | <input type="checkbox"/> MFA | <input type="checkbox"/> MHP | <input type="checkbox"/> MPP | <input type="checkbox"/> MS | <input type="checkbox"/> PSM |
|-----------|------------------------------|-----------------------------|-------------------------------|--------------------------------|--------------------------------|--|-----------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|------------------------------|

| | | | |
|--------------------|-----------------|---------------|----------|
| Last Name (Family) | First Name | Middle Init. | (Former) |
| Day Phone # | ID# | Email Address | |
| Degree Now Held | When/Where Rcvd | | |

| | |
|---|--|
| Academic Unit | |
| Major | |
| Minor <input type="checkbox"/> or Option <input type="checkbox"/> | |
| <small>(please check one)</small> | |
| Minor <input type="checkbox"/> or Option <input type="checkbox"/> | |
| <small>(please check one)</small> | |

| | | |
|-----------|--|---------------------------------|
| Check One | <input checked="" type="checkbox"/> Non-Thesis | <input type="checkbox"/> Thesis |
|-----------|--|---------------------------------|

| CAPSTONE | | | | | | |
|-----------------|----|---|--------|-----|-----|-----|
| Transfer Symbol | G* | Thesis (6-12 credits) If applicable | Course | | Cr. | Gr. |
| | | | Dept. | No. | | |
| | | | | 503 | | |
| | | | | | | |
| Transfer Symbol | G* | Non-Thesis Project, Research or PSM Internship (3-6 credits) If applicable | Course | | Cr. | Gr. |
| | | | Dept. | No. | | |
| | | | | 501 | | |
| | | | | 505 | | |
| | | | | 506 | | |
| | | | | 510 | | |
| Total | | | | | | |

| Transfer Symbol | G* | Title of Major Courses | Course | | Cr. | Gr. |
|-----------------|----|------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| G | | Cell & Molec BioE | BIOE | 511 | 3 | |
| | | Bioconjugation | BIOE | 540 | 3 | |
| | | SocJus, Ethics, Eng | BIOE | 520 | 3 | |
| G | | Chm Eng Analysis | CHE | 525 | 4 | |
| G | | Modeling Phys Syst | BIOE | 512 | 4 | |
| G | | Drug & Med Dev Reg | BIOE | 513 | 2 | |
| G | | Bioelc Sys & Device | ECE | 599 | 4 | |
| G | | Seminar Prof Dev | CBEE | 507 | 1 | |
| | | Bioreactors | BIOE | 557 | 3 | |
| G | | Fluid Flow | CHE | 514 | 4 | |
| G | | Microreactor Eng | CHE | 581 | 3 | |
| Total | | | | | 34 | |

If additional lines are needed, use a second form

SUPPORTIVE REQUISITES

MA ONLY: Foreign language requirements vary among academic units.

| | |
|-----------|--|
| Languages | |
|-----------|--|

Master's students are expected to "Be able to conduct scholarly or professional activities in an ethical manner". Indicate the training you have completed or will complete to meet this learning outcome. See page 2 of this form for more information.

| | |
|---------------------------|--------------------------------------|
| Ethical Research Training | CITI Responsible Conduct of Research |
|---------------------------|--------------------------------------|

SFM ONLY (MF, MS & PhD): See SFM Advising Guide

| | |
|------------------------|--|
| Communication Training | |
|------------------------|--|

| | |
|---------------------------------------|-----------|
| a. Total Major Hours | |
| b. Total First Minor or Option Hours | |
| c. Total Blanket Hour Credits | 1 |
| d. Total 4XX/5XX Program Credits | 15 |
| e. Total Graduate Standalone Credits | 30 |
| TOTAL CREDITS ON PROGRAM (d+e) | 45 |

*Mark courses that will be graduate standalone with the letter "G" in this column.

| Transfer Symbol | G* | Title of Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|----------------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |

If additional lines are needed, use a second form

| Transfer Symbol | G* | Title of Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|----------------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |

If additional lines are needed, use a second form

Transfer courses indicated above:

| Transfer Symbol | University |
|-----------------|------------|
| T1 | |
| T2 | |
| T3 | |



| | | | | | | | | | | | | |
|-----------|------------------------------|-----------------------------|-------------------------------|--------------------------------|--------------------------------|--|-----------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|------------------------------|
| Check One | <input type="checkbox"/> EdM | <input type="checkbox"/> MA | <input type="checkbox"/> MAPE | <input type="checkbox"/> MATRN | <input type="checkbox"/> MCoun | <input checked="" type="checkbox"/> MEng | <input type="checkbox"/> MF | <input type="checkbox"/> MFA | <input type="checkbox"/> MHP | <input type="checkbox"/> MPP | <input type="checkbox"/> MS | <input type="checkbox"/> PSM |
|-----------|------------------------------|-----------------------------|-------------------------------|--------------------------------|--------------------------------|--|-----------------------------|------------------------------|------------------------------|------------------------------|-----------------------------|------------------------------|

| | | | |
|--------------------|-----------------|---------------|----------|
| Last Name (Family) | First Name | Middle Init. | (Former) |
| Day Phone # | ID# | Email Address | |
| Degree Now Held | When/Where Rcvd | | |

| | |
|---|--|
| Academic Unit | |
| Major | |
| Minor <input type="checkbox"/> or Option <input type="checkbox"/> | |
| <small>(please check one)</small> | |
| Minor <input type="checkbox"/> or Option <input type="checkbox"/> | |
| <small>(please check one)</small> | |

| | | |
|-----------|--|---------------------------------|
| Check One | <input checked="" type="checkbox"/> Non-Thesis | <input type="checkbox"/> Thesis |
|-----------|--|---------------------------------|

| CAPSTONE | | | | | | |
|-----------------|----|---|--------|-----|-----|-----|
| Transfer Symbol | G* | Thesis (6-12 credits) If applicable | Course | | Cr. | Gr. |
| | | | Dept. | No. | | |
| | | | | 503 | | |
| | | | | | | |
| Transfer Symbol | G* | Non-Thesis Project, Research or PSM Internship (3-6 credits) If applicable | Course | | Cr. | Gr. |
| | | | Dept. | No. | | |
| | | | | 501 | | |
| | | | | 505 | | |
| | | | | 506 | | |
| | | | | 510 | | |
| Total | | | | | | |

| Transfer Symbol | G* | Title of Major Courses | Course | | Cr. | Gr. |
|-----------------|----|------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | G | Molecular Tools | MCB | 671 | 3 | |
| | | Bioseparations | BIOE | 562 | 3 | |
| | G | Portfolio Prep | ENGR | 599 | 1 | |
| | G | Portfolio Complet | ENGR | 599 | 1 | |
| | | Topics in Comp Sci | CS | 519 | 3 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | 11 | |

If additional lines are needed, use a second form

SUPPORTIVE REQUISITES

MA ONLY: Foreign language requirements vary among academic units.

| | |
|-----------|--|
| Languages | |
|-----------|--|

Master's students are expected to "Be able to conduct scholarly or professional activities in an ethical manner". Indicate the training you have completed or will complete to meet this learning outcome. See page 2 of this form for more information.

| | |
|---------------------------|--|
| Ethical Research Training | |
|---------------------------|--|

SFM ONLY (MF, MS & PhD): See SFM Advising Guide

| | |
|------------------------|--|
| Communication Training | |
|------------------------|--|

| | |
|---------------------------------------|-----------|
| a. Total Major Hours | |
| b. Total First Minor or Option Hours | |
| c. Total Blanket Hour Credits | |
| d. Total 4XX/5XX Program Credits | |
| e. Total Graduate Standalone Credits | |
| TOTAL CREDITS ON PROGRAM (d+e) | 45 |

*Mark courses that will be graduate standalone with the letter "G" in this column.

| Transfer Symbol | G* | Title of Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|----------------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |

If additional lines are needed, use a second form

| Transfer Symbol | G* | Title of Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|----------------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |

If additional lines are needed, use a second form

Transfer courses indicated above:

| Transfer Symbol | University |
|-----------------|------------|
| T1 | |
| T2 | |
| T3 | |



The program of study will be audited to determine if it is accurate and it meets the minimum requirements for this degree as established by the OSU Faculty Senate. Please be sure that the following items are correct:

1. The correct degree is indicated in the first row. Please refer to and attach an unofficial copy of your transcript.
2. Student name, phone, ID number, email address, degree held, year the degree was awarded, and institution from which it was received are filled in.
3. The academic units, majors, and thesis or non-thesis are indicated.
4. If your degree includes a thesis, the program of study must include from 6 to 12 credits of XXX503 Thesis, where XXX is the course code of your major. If both majors require a thesis, an approximately equal amount of thesis is taken in each major. The thesis can be directed by one person qualified in both majors or by co-major professors (one in each major). If one major requires a thesis and the other does not, the major requiring a thesis should list 6-12 credits of XXX503 and the major that does not require a thesis may list up to 6 credits of XXX501 or XXX506.
5. If your degree is non-thesis, the program of study must include 3 to 6 credits of project such as XXX501 or XXX506. If both majors offer a non-thesis option, each may list 3 to 6 credits of XXX 501 or XXX506.
6. The maximum number of blanket numbered credits is 24 on a 60 credit degree program or 9 on a 45 credit degree program.
7. A transfer symbol is indicated for each transfer course (T1 for the first university, T2 for the second, etc.)
8. Transfer courses have been approved by your major advisor and minor advisor if they are in the minor field. All transfer courses must be either:
 - a. Graduate courses taken at OSU while enrolled as a non-degree, undergraduate, or post baccalaureate student and not used to satisfy undergraduate degree requirements;
 - b. Graduate courses taken at OSU in a prior graduate degree program and falling within the limits of transfer credit accepted from one OSU graduate degree to a second OSU graduate degree (refer to current graduate catalog); or
 - c. Graduate courses taken at other accredited universities but not used to satisfy requirements for a bachelor's, master's, or doctoral degree or international equivalents;
 - d. Thesis credits must not be included.
9. All courses listed as transfer courses must comply with policies :
 - a. OSU courses graded C, C+, B-,B, B+, A-, A, or A+ (no P/N, S/U, credit/no credit graded courses will be allowed), or
 - b. external transfer grades of "B-" (2.70) or better have been earned; and
 - c. not have been used on a previous master's or doctoral degree, and
 - d. must not be thesis credit.
10. Thirty (30) credits must be taken at OSU after having been admitted as a regular, degree-seeking graduate student. (Transfer courses, as defined above, cannot be counted toward this residence requirement.)
11. For each standalone graduate course a G is entered in the G column.
12. Each course in the major and minor has a title, abbreviated if necessary, a department code, a course number, number of credits and a grade, if the course has been completed.
13. Grades of non-transfer courses listed on this program will be either C or above, or P, or R for research.
14. The total number of credits at the 4XX/5XX level is entered and the number of 5XX or 6XX credits is entered.
15. No more than 50% of the credits are slash courses (the 5XX component of a 4XX/5XX course). To determine if a course is a slash course examine the OSU course catalog for the term that you took 5XX course. If there is a 4xx course with the same title during the same term, then this is a slash course.
16. Your plan includes training in the conduct of scholarly or professional activities in an ethical manner. This could be a course offered by your degree program, GRAD 520, RCR training modules, training in research groups, etc. For more information on the requirement, see http://oregonstate.edu/dept/grad_school/assessment.php.
17. Your total number of credits must be at least 45. (Your major/track may require more credits—check with them.)
18. All work toward this degree will be completed within seven (7) years. This includes transfer credits, all course work, all examinations, and final library copies of thesis, if applicable.
19. Your major professor(s) must belong to the Graduate Faculty in your majors. Your minor professor, if you have a minor, must be a Graduate Faculty member in your minor.



20. Committee Requirements:

- a. **MA, MAPE, MATRN, MCoun, MEng, MFA, MHP, MPP, MS, PSM:** *Non-Thesis:* The examining committee consists of three members of the graduate faculty-two in the major field and one in the minor field if a minor is included. When a minor is not included, the third member may be from the graduate faculty at large. *Thesis:* The examining committee consists of at least four members of the graduate faculty-two in the major field, one in the minor field if a minor is included, and a Graduate Council representative. When a minor is not included, the fourth member may be from the graduate faculty at large.
- b. **EdM:** Individual committees are usually not established for students in these programs. Each student will need to identify a Graduate Faculty member from the major department and Graduate Faculty member representing the minor department if a minor is declared.
- c. **MF:** Two members of the Graduate Faculty from the major department; one member of the Graduate Faculty from the minor if a minor is declared, otherwise another member of the Graduate Faculty; and a Graduate Council Representative if a thesis is involved. The major professor is one of the two members representing the major department.

21. The program of study must be signed by the student, all committee members, and the academic unit chair.

| | | | |
|--|-------------------|------------------|-------------|
| Student's Signature | | <i>Signature</i> | <i>Date</i> |
| APPROVED - Major Professor | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Chair, Academic Unit | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Minor Professor | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Graduate Council Representative | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Committee Member | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Committee Member | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Graduate School | | <i>Signature</i> | <i>Date</i> |

Return this program of study to the:

Graduate School
 Heckart Lodge
 2900 SW Jefferson Way
 Corvallis, OR 97331
Graduate.School@oregonstate.edu
 541-737-4881



| | | | | | | | | | | | | |
|-----------|------------------------------|-----------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|--|------------------------------|
| Check One | <input type="checkbox"/> EdM | <input type="checkbox"/> MA | <input type="checkbox"/> MAPE | <input type="checkbox"/> MATRN | <input type="checkbox"/> MCoun | <input type="checkbox"/> MEng | <input type="checkbox"/> MF | <input type="checkbox"/> MFA | <input type="checkbox"/> MHP | <input type="checkbox"/> MPP | <input checked="" type="checkbox"/> MS | <input type="checkbox"/> PSM |
|-----------|------------------------------|-----------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|--|------------------------------|

| | | | |
|--------------------|-----------------|---------------|----------|
| Last Name (Family) | First Name | Middle Init. | (Former) |
| Day Phone # | ID# | Email Address | |
| Degree Now Held | When/Where Rcvd | | |

| | |
|---|--|
| Academic Unit | |
| Major | |
| Minor <input type="checkbox"/> or Option <input type="checkbox"/> | |
| <small>(please check one)</small> | |
| Minor <input type="checkbox"/> or Option <input type="checkbox"/> | |
| <small>(please check one)</small> | |

| | | |
|-----------|-------------------------------------|--|
| Check One | <input type="checkbox"/> Non-Thesis | <input checked="" type="checkbox"/> Thesis |
|-----------|-------------------------------------|--|

| CAPSTONE | | | | | | |
|-----------------|----|---|--------|-----|-----------|-----|
| Transfer Symbol | G* | Thesis (6-12 credits) If applicable | Course | | Cr. | Gr. |
| | | | Dept. | No. | | |
| | | Thesis | BIOE | 503 | 12 | |
| | | | | | | |
| | | | | | | |
| Transfer Symbol | G* | Non-Thesis Project, Research or PSM Internship (3-6 credits) If applicable | Course | | Cr. | Gr. |
| | | | Dept. | No. | | |
| | | | | 501 | | |
| | | | | 505 | | |
| | | | | 506 | | |
| | | | | 510 | | |
| Total | | | | | 12 | |

| Transfer Symbol | G* | Title of Major Courses | Course | | Cr. | Gr. |
|-----------------|----|------------------------|--------|-----|-----------|-----|
| | | | Dept. | No. | | |
| | G | Cell & Molec BioE | BIOE | 511 | 3 | |
| | | Bioconjugation | BIOE | 540 | 3 | |
| | | SocJus, Ethics, Eng | BIOE | 520 | 3 | |
| | G | Chm Eng Analysis | CHE | 525 | 4 | |
| | G | Modeling Phys Syst | BIOE | 512 | 4 | |
| | G | Drug & Med Dev Reg | BIOE | 513 | 2 | |
| | G | Bioelc Sys & Device | ECE | 599 | 4 | |
| | G | Seminar Prof Dev | CBEE | 507 | 3 | |
| | | Bioreactors | BIOE | 557 | 3 | |
| | G | Fluid Flow | CHE | 514 | 4 | |
| Total | | | | | 33 | |

If additional lines are needed, use a second form

SUPPORTIVE REQUISITES

MA ONLY: Foreign language requirements vary among academic units.

| | |
|-----------|--|
| Languages | |
|-----------|--|

Master's students are expected to "Be able to conduct scholarly or professional activities in an ethical manner". Indicate the training you have completed or will complete to meet this learning outcome. See page 2 of this form for more information.

| | |
|---------------------------|--------------------------------------|
| Ethical Research Training | CITI Responsible Conduct of Research |
|---------------------------|--------------------------------------|

SFM ONLY (MF, MS & PhD): See SFM Advising Guide

| | |
|------------------------|--|
| Communication Training | |
|------------------------|--|

| | |
|---------------------------------------|-----------|
| a. Total Major Hours | |
| b. Total First Minor or Option Hours | |
| c. Total Blanket Hour Credits | 3 |
| d. Total 4XX/5XX Program Credits | 9 |
| e. Total Graduate Standalone Credits | 36 |
| TOTAL CREDITS ON PROGRAM (d+e) | 45 |

*Mark courses that will be graduate standalone with the letter "G" in this column.

| Transfer Symbol | G* | Title of Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|----------------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |

If additional lines are needed, use a second form

| Transfer Symbol | G* | Title of Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|----------------------------------|--------|-----|-----|-----|
| | | | Dept. | No. | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total | | | | | | |

If additional lines are needed, use a second form

Transfer courses indicated above:

| Transfer Symbol | University |
|-----------------|------------|
| T1 | |
| T2 | |
| T3 | |



The program of study will be audited to determine if it is accurate and it meets the minimum requirements for this degree as established by the OSU Faculty Senate. Please be sure that the following items are correct:

1. The correct degree is indicated in the first row. Please refer to and attach an unofficial copy of your transcript.
2. Student name, phone, ID number, email address, degree held, year the degree was awarded, and institution from which it was received are filled in.
3. The academic units, majors, and thesis or non-thesis are indicated.
4. If your degree includes a thesis, the program of study must include from 6 to 12 credits of XXX503 Thesis, where XXX is the course code of your major. If both majors require a thesis, an approximately equal amount of thesis is taken in each major. The thesis can be directed by one person qualified in both majors or by co-major professors (one in each major). If one major requires a thesis and the other does not, the major requiring a thesis should list 6-12 credits of XXX503 and the major that does not require a thesis may list up to 6 credits of XXX501 or XXX506.
5. If your degree is non-thesis, the program of study must include 3 to 6 credits of project such as XXX501 or XXX506. If both majors offer a non-thesis option, each may list 3 to 6 credits of XXX 501 or XXX506.
6. The maximum number of blanket numbered credits is 24 on a 60 credit degree program or 9 on a 45 credit degree program.
7. A transfer symbol is indicated for each transfer course (T1 for the first university, T2 for the second, etc.)
8. Transfer courses have been approved by your major advisor and minor advisor if they are in the minor field. All transfer courses must be either:
 - a. Graduate courses taken at OSU while enrolled as a non-degree, undergraduate, or post baccalaureate student and not used to satisfy undergraduate degree requirements;
 - b. Graduate courses taken at OSU in a prior graduate degree program and falling within the limits of transfer credit accepted from one OSU graduate degree to a second OSU graduate degree (refer to current graduate catalog); or
 - c. Graduate courses taken at other accredited universities but not used to satisfy requirements for a bachelor's, master's, or doctoral degree or international equivalents;
 - d. Thesis credits must not be included.
9. All courses listed as transfer courses must comply with policies :
 - a. OSU courses graded C, C+, B-,B, B+, A-, A, or A+ (no P/N, S/U, credit/no credit graded courses will be allowed), or
 - b. external transfer grades of "B-" (2.70) or better have been earned; and
 - c. not have been used on a previous master's or doctoral degree, and
 - d. must not be thesis credit.
10. Thirty (30) credits must be taken at OSU after having been admitted as a regular, degree-seeking graduate student. (Transfer courses, as defined above, cannot be counted toward this residence requirement.)
11. For each standalone graduate course a G is entered in the G column.
12. Each course in the major and minor has a title, abbreviated if necessary, a department code, a course number, number of credits and a grade, if the course has been completed.
13. Grades of non-transfer courses listed on this program will be either C or above, or P, or R for research.
14. The total number of credits at the 4XX/5XX level is entered and the number of 5XX or 6XX credits is entered.
15. No more than 50% of the credits are slash courses (the 5XX component of a 4XX/5XX course). To determine if a course is a slash course examine the OSU course catalog for the term that you took 5XX course. If there is a 4xx course with the same title during the same term, then this is a slash course.
16. Your plan includes training in the conduct of scholarly or professional activities in an ethical manner. This could be a course offered by your degree program, GRAD 520, RCR training modules, training in research groups, etc. For more information on the requirement, see http://oregonstate.edu/dept/grad_school/assessment.php.
17. Your total number of credits must be at least 45. (Your major/track may require more credits—check with them.)
18. All work toward this degree will be completed within seven (7) years. This includes transfer credits, all course work, all examinations, and final library copies of thesis, if applicable.
19. Your major professor(s) must belong to the Graduate Faculty in your majors. Your minor professor, if you have a minor, must be a Graduate Faculty member in your minor.



20. Committee Requirements:

- a. **MA, MAPE, MATRN, MCoun, MEng, MFA, MHP, MPP, MS, PSM: Non-Thesis:** The examining committee consists of three members of the graduate faculty-two in the major field and one in the minor field if a minor is included. When a minor is not included, the third member may be from the graduate faculty at large. *Thesis:* The examining committee consists of at least four members of the graduate faculty-two in the major field, one in the minor field if a minor is included, and a Graduate Council representative. When a minor is not included, the fourth member may be from the graduate faculty at large.
- b. **EdM:** Individual committees are usually not established for students in these programs. Each student will need to identify a Graduate Faculty member from the major department and Graduate Faculty member representing the minor department if a minor is declared.
- c. **MF:** Two members of the Graduate Faculty from the major department; one member of the Graduate Faculty from the minor if a minor is declared, otherwise another member of the Graduate Faculty; and a Graduate Council Representative if a thesis is involved. The major professor is one of the two members representing the major department.

21. The program of study must be signed by the student, all committee members, and the academic unit chair.

| | | | |
|--|-------------------|------------------|-------------|
| Student's Signature | | <i>Signature</i> | <i>Date</i> |
| APPROVED - Major Professor | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Chair, Academic Unit | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Minor Professor | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Graduate Council Representative | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Committee Member | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Committee Member | <i>Typed Name</i> | <i>Signature</i> | <i>Date</i> |
| APPROVED - Graduate School | | <i>Signature</i> | <i>Date</i> |

Return this program of study to the:

Graduate School
 Heckart Lodge
 2900 SW Jefferson Way
 Corvallis, OR 97331
Graduate.School@oregonstate.edu
 541-737-4881

DOCTORAL DEGREE

| | | |
|------------------|---|------------------------------|
| Check One | <input checked="" type="checkbox"/> PhD | <input type="checkbox"/> EdD |
|------------------|---|------------------------------|

| | | | |
|---------------------------|-------------------|----------------------|-----------------|
| Last Name (Family) | First Name | Middle Init. | (Former) |
| Day Phone # | ID# | Email Address | |

| | | | | |
|---------------------|-------------------|--------------|---------------|-------------|
| Degrees Held | University | Major | Degree | Date |
| | University | Major | Degree | Date |

| | |
|----------------------|---|
| Academic Unit | First Minor <input type="checkbox"/> or Option <input type="checkbox"/> |
| Major | Second Minor <input type="checkbox"/> or Option <input type="checkbox"/> |

(Please check one)

| Transfer Symbol | G* | Title of Major Courses | Course | | Cr. | Gr. |
|-----------------|----|------------------------|--------|-----|--------------|------------|
| | | | Dept. | No. | | |
| | G | Cell & Molec BioE | BIOE | 511 | 3 | |
| | | Bioconjugation | BIOE | 540 | 3 | |
| | | SocJus, Ethics, Eng | BIOE | 520 | 3 | |
| | G | Chm Eng Analysis | CHE | 525 | 4 | |
| | G | Modeling Phys Syst | BIOE | 512 | 4 | |
| | G | Drug & Med Dev Reg | BIOE | 513 | 2 | |
| | G | Motr Ctrl & Mov Dys | KIN | 515 | 3 | |
| | G | Seminar Prof Dev | CBEE | 507 | 3 | |
| | | Bioreactors | BIOE | 557 | 3 | |
| | G | Fluid Flow | CHE | 514 | 4 | |
| | G | Intro to Num Method | CHE | 581 | 3 | |
| | G | Thesis | BIOE | 603 | 73 | |
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| | | | | | Total | 108 |

If additional lines are needed, use a second form

| | |
|--|------------|
| a. Total Major Hours | 108 |
| b. Total First Minor or Option Hours | |
| c. Total Second Minor or Option Hours | |
| d. Total Blanket Hour Credits | 3 |
| e. Total 4XX/5XX Program Credits | 9 |
| f. Total Graduate Standalone Credits | 99 |
| TOTAL CREDITS ON PROGRAM (e+f) | 108 |

*Mark courses that will be graduate standalone with the letter "G" in this column.

| Transfer Symbol | G* | Title of First Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|--|--------|-----|--------------|-----|
| | | | Dept. | No. | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | | | | | Total | |

If additional lines are needed, use a second form

| Transfer Symbol | G* | Title of Second Minor or Option Courses | Course | | Cr. | Gr. |
|-----------------|----|---|--------|-----|--------------|-----|
| | | | Dept. | No. | | |
| | | | | | | |
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| | | | | | Total | |

If additional lines are needed, use a second form

Transfer courses indicated above:

| Transfer Symbol | University |
|-----------------|------------|
| T1 | |
| T2 | |
| T3 | |
| T4 | |

SUPPORTIVE REQUISITES

Foreign language requirements vary among academic units.

| | |
|------------------|--|
| Languages | |
|------------------|--|

Doctoral students are expected to "Be able to conduct scholarly or professional activities in an ethical manner". Indicate the training you have completed or will complete to meet this learning outcome. See [page 2](#) of this form for more information.

| | |
|----------------------------------|--------------------------------------|
| Ethical Research Training | CITI Responsible Conduct of Research |
|----------------------------------|--------------------------------------|

SFM ONLY (MF, MS & PhD): See SFM Advising Guide

| | |
|-------------------------------|--|
| Communication Training | |
|-------------------------------|--|

The **program of study will be audited** to determine if it is accurate and it meets the minimum requirements for this degree as established by the OSU Faculty Senate. Please be sure that the following items are correct:

1. Student name, phone, ID number, email address, degree held, year awarded, and institution from which it was received.
2. The academic unit, major, minor and option, if applicable, are indicated. Please run an **unofficial** copy of your OSU transcript to attach to this form:
https://adminfo.ucsadm.oregonstate.edu/prod/twbkwbis.P_WWWLogin
3. The program of study satisfies the residence requirement. That is, (1) a minimum of 36 credits on the form are courses taken at OSU after admission as a regular, degree-seeking graduate student and (2) a minimum of three terms of full-time graduate academic work (at least 9 credits/term) will be spent on site at the Corvallis campus or at an off-campus site approved by the Graduate School. Transfer courses as defined above are not counted toward this residence requirement.
4. The maximum number of blanket numbered credits is 15 on a 108 credit degree program.
5. A transfer symbol is indicated for each transfer course (T1 for the first university, T2 for the second, etc.)
6. Transfer courses must have been approved by your major advisor and minor advisor if they are in the minor field. All transfer courses must be either:
 - a. Graduate courses taken at OSU while enrolled as a non-degree, undergraduate, or post baccalaureate student and not used to satisfy undergraduate degree requirements;
 - b. Graduate courses taken at OSU in a prior graduate degree program and falling within the limits of transfer credit accepted from one OSU graduate degree to a second OSU graduate degree (refer to current graduate catalog); or
 - c. Graduate courses taken at other accredited universities but not used to satisfy the requirements for a bachelor's degree or international equivalent.
7. All courses listed as transfer courses must comply with policies :
 - a. OSU courses graded C, C+, B-, B, B+, A-, A, or A+ (no P/N, S/U, credit/no credit graded courses will be allowed), or
 - b. external transfer grades of "B-" (2.70) or better have been earned, and
 - c. not have been used on a previous doctoral degree; and
 - d. must not include thesis credits.
8. For each standalone graduate course a G is entered in the G column.
9. Each course in the major and minor has a title, abbreviated if necessary, a department code, a course number, number of credits and a grade, if the course has been completed.
10. Grades of non-transfer courses listed on this program will be either C or above, or P, or R for research.
11. The total number of credits at the 4XX/5XX level is entered. And the number of 5XX or 6XX credits is entered.
12. No more than 50% of the credits are slash courses (the 5XX component of a 4XX/5XX course). To determine if a course is a slash course examine the OSU course catalog for the term that you took 5XX course. If there is a 4xx course with the same title during the same term, then this is a slash course.
13. A minimum of 36 credits of XXX603 Thesis is entered.
14. Your plan includes training in the conduct of scholarly activities in an ethical manner. See <http://gradschool.oregonstate.edu/faculty/program-assessment>.
15. Your total number of credits must be at least 108. (Your major may require more credits—check with them.)
16. Your major professor and at least one other member of your committee must be members of the Graduate Faculty in your major. Your minor professor, if you have a minor, must be a Graduate Faculty member in your minor. All other committee members must be members of the OSU graduate faculty with authority to serve on doctoral advisory committees.
17. The program of study must be signed by the student, the student's committee members, and the academic unit chair.

| | | | |
|--|-------------------|------------------|-------------|
| Student's Signature | | <i>Signature</i> | <i>Date</i> |
| APPROVED - Major Professor | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Chair, Academic Unit | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - First Minor Professor | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Second Minor Professor | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Graduate Council Representative | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Committee Member | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Committee Member | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Committee Member (if no minor) | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Committee Member (if no minor) | | <i>Signature</i> | <i>Date</i> |
| | <i>Typed Name</i> | | |
| APPROVED - Graduate School | | <i>Signature</i> | <i>Date</i> |

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