COLLEGE OF ENGINEERING

School of Chemical, Biological, and Environmental Engineering

Environmental Engineering

2021-2022

Graduate Handbook

Oregon State University

Contents

NOTE: Official program requirements are available in the OSU catalog. If there is a conflict between what is stated here and what is presented in the catalog, the catalog requirements take precedent.

COURSEWORK REQUIREMENTS

PREREQUISITE COURSEWORK

At a minimum, the following courses must be taken prior to enrollment in the core graduate course curriculum. Your academic advisor should be consulted to ensure the proper pre- and co-requisite path is taken.

Environmental Engineering

Students without a B.S. degree in Environmental Engineering (or equivalent Engineering degree) must take the following courses in addition to the ENVE core:

Pre-requisite courses (completion required before taking graduate level ENVE core courses)

- Math through Differential Equations
- One year of General Chemistry
- One year of Physics
- CBEE 211 (3) Material Balances and Stoichiometry or CBEE 280 (6) Material and Energy Balances

Co-requisite courses

- ENVE 521 (4) Drinking Water Treatment Processes**
- ENVE 522 (4) Wastewater Treatment Processes**
- ENVE 531 (4) Fate and Transport of Chemicals in Environmental Systems
- CE 547 (4) Water Resources Engineering I: Principles of Fluid Mechanics

***Note: credits earned for ENVE 521 and ENVE 522 will not be counted toward the 45 units needed for graduation.*

REQUIRED COURSEWORK

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

CHE 525	(4)	Chemical Engineering Analysis
ENVE 532	(4)	Aquatic Chemistry: Natural and Engineered Systems
ENVE 535	(4)	Physical and Chemical Processes
ENVE 536	(1)	Aqueous Environmental Chemistry Laboratory
ENVE 541	(4)	Microbial Processes in Environmental Systems
CBEE 507	(3)	Grad 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). These courses are 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 are required to register for CBEE 507 Presentation section, all terms (F/W/Sp).

MEng* *students are also required to enroll in* ***ENGR 520 Portfolio Prep* *in their first term and* ***ENGR 521 Portfolio Completion*** *during their last term in residence to support completion of their final portfolio (more details below).* ***They will only 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.*

Additional Requirements for MEng students: MEng students are required to take an additional 10 credits of engineering coursework with one course being chosen from the following list:

- ENVE 525 (3) Air Pollution Control
- ENVE 531 (4) Fate and Transport of Chemicals in Environmental Systems
- ENVE 556 (3) Sustainable Water Resources Development

Additional coursework considerations for Ph.D. students: Ph.D. students entering the program following an M.S. degree in Environmental Engineering from OSU have no specific course requirements beyond those required by the Graduate School.

For Ph.D. students entering the program following an M.S. in Environmental Engineering (or equivalent M.S. degree) from another institution, waivers for individual courses in the above list will be made on a case by case basis, provided that an equivalent course was taken as part of the M.S. degree. In such instances, students must supply a transcript and course syllabus for the course they believe is a suitable replacement for the required course listed above to the Graduate Programs Coordinator for approval by the Graduate Committee or the Associate School Head.

Publishing Expectations:

Publication of M.S. and Ph.D. level research findings in the peer reviewed literature is vital to the success and reputation of the graduate programs in CBEE. In most cases, this mechanism of dissemination is the most efficient and effective vehicle for communicating our work to relevant stakeholders, particularly other experts in the field. For faculty, publications are of critical importance for career advancement as evaluated through the promotion and tenure process. For students pursuing research and academic careers, publications serve a similar purpose. 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.

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.

In the School of CBEE, publication in peer-reviewed manuscripts is strongly encouraged by all research-based students, especially those pursuing a Ph.D. As outlined above, these expectations are believed to be in the best interests of students, faculty and the School. 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. An important mechanism for formalizing and assessing progress towards these aims is the annual assessment of satisfactory

academic progress (see Appendix). This process provides a structure for faculty and students to set goals and expectations regarding publishing and to assess progress towards those goals on a yearly basis. For context, faculty members are evaluated on a similar basis via annual evaluations with the School Head and through mid-tenure, tenure, and promotion processes at the College and University levels.

MASTER'S DEGREE PROGRAMS

The Environmental Engineering program offers two types of master's degrees:

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

Each degree requires a minimum of 45 credits to graduate; each with a set of core course requirements totaling 23 and 20 credits respectively. Additional credits above 45 may be required depending on the educational background of the student. All students must complete a Program of Study form (see Procedures for getting a Master's degree below) before completing 18 credits. All work must be completed within seven years, including transfer credits, course work, and the thesis/portfolio.

In addition to the formal requirements listed in the Graduate School Catalog (https://catalog.oregonstate.edu/college-departments/graduate-school/), CBEE has policies listed below regarding the course of study for each Master's degree.

As with all policy matters, students have the right to petition for deviation from school policies to the CBEE School Graduate Committee. Such petitions must be made in writing, indicating the policy deviation requested and the reason(s) for the request. The decisions of the CBEE Graduate Committee are final.

Master of Engineering

The MEng degree option provides students the opportunity to pursue advanced-level study without the requirement for a research thesis. A capstone portfolio serves as one's final exam in lieu of a 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.

Master of Science

A thesis in the major area is required for the MS degree, and the thesis format is bound by the rules of the Graduate School (https://gradschool.oregonstate.edu/progress/thesis-guide). Nine of the required 45 graded credit hours must be thesis credits; more thesis credits may be taken to fulfill GRA/GTA registration requirements, but only nine credits of thesis can appear/count on the Program of Study.

Minor Option

A minor field of study is optional. If a minor is declared, however, the minor requirement specified by the Graduate School is 15 credits minimum (18 minimum for doctoral). Master's students are expected to take 15 credits or more of minor subject courses if the minor is "integrated" (i.e., it spans two or more schools). The CBEE Graduate Committee may apply suitable courses to such an integrated minor requirement as long as the courses are not in your major area of concentration and they comprise less than one-half of the credits in the minor.

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 521: Portfolio Completion. The final portfolio will be assessed by both the course instructor and the student's academic advisor according to the rubric included in the Appendices. 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.

MASTER'S THESIS (MS STUDENTS)

The thesis demonstrates the student's mastery of professional knowledge in a particular subject area of their 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.

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 (https://gradschool.oregonstate.edu/forms) with the Graduate School at least two weeks prior to the intended defense date. See your major professor for any other rules regarding thesis defense preparation requirements.

An MS candidate will be subjected to a final oral comprehensive examination, which includes a thesis research presentation and defense and questions on major, minor, and other pertinent academic subjects.

THESIS DEFENSE COMMITTEES (MS STUDENTS)

1. 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.

2. The Committee consists of at least 4 members:
   - the student's major professor;
   - one other CBEE 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 (GCR).

Note that the composition of a student's Master's Committee MUST be approved by the major professor.

3. 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). Information on the role and duties of the GCR, and how to choose one (the aforementioned online tool), can be found at the following website:

   https://gradschool.oregonstate.edu/progress/graduate-committee#council

PROCEDURES LEADING TO A MASTER'S DEGREE

Below is an outline of the steps required to obtain the Master's degree (with a chart each for MEng and MS, respectively). You should become familiar with the specific and detailed information contained in the Graduate School Catalog, as well as School requirements. For MS students, final oral exams must take place before the first day of the following term to be considered for the current term (late exams will require registration for 3 credits in the following term if not completed).

PROCEDURES FOR MENG			
Check Box	**Item #**	**Step**	**Timing**
	1	Be assigned a major professor	By the end of your first term
	2	Submit your Program of Study to Grad School	By the end of second term
	3	Register for ENGR 521 MENG Portfolio Class	Final term in residence
	4	Compare Program of Study form and transcripts for consistency	Completed in ENGR 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 521 course
	10	Submit final draft of MEng Portfolio to MEng Coordinator, Anita Hughes	Using timeline within ENGR 521
	11	Graduate School Survey will be emailed to you. If you complete it a gift will be mailed to you.	A month after graduation

PROCEDURES FOR MS STUDENTS			
Check Box	**Item #**	**Step**	**Timing**
	1	Choose a major professor and a general thesis topic	By the end of your second quarter
	2	Appoint Masters Committee with approval of your major professor	By completion of third quarter
	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 CBEE Graduate Learning Outcomes rubric used for evaluating final exams (see Handbook appendix)	
	12	Complete final draft of your thesis, and submit it to your major professor for review and approval	By the start of your last term
	13	Decide on a day and time (at least 2 hours) with all Committee members (faculty & Grad Council Rep)	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; if you miss the deadline, you may be required to register for an additional 3 credits.
	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

ENVE DOCTORAL PROGRAM

The university requirements for the doctorate include the following:

1. at least 108 graduate credits beyond the bachelor's degree;
2. at least 50% of the course work must be graduate stand-alone courses;
3. a presentation of an original dissertation for which a minimum of 36 credit hours of dissertation research (thesis course) has been accumulated;
4. a minimum of one year of residence, continuously, at OSU (i.e., three consecutive quarters as a full time student);
5. passing a preliminary oral examination in the major subject; and
6. successfully defending the dissertation in an oral presentation to a panel of experts.

For other regulations, see the OSU Graduate School Catalog.

In addition, school requirements include:

- A minimum of one full-time academic year of regular non-blanket course work (at least 36 credits) must be included on the doctoral program
- No more than 15 credits of blanket-numbered courses, other than thesis, may be included in the minimum 108-credit program

**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 Environmental Engineering must take the following six ENVE core courses:

CHE 525	(4)	Chemical Engineering Analysis
ENVE 532	(4)	Aquatic Chemistry: Natural and Engineered Systems
ENVE 535	(4)	Physical and Chemical Processes for Hazardous Waste Treatment
ENVE 536	(1)	Aqueous Environmental Chemistry Laboratory
ENVE 541	(4)	Microbial Processes in Environmental Systems
CBEE 507	(3)	Grad Seminar: Professional Development (F/W/Sp – 3 credits total)

A Ph.D. candidate without a B.S. degree in Environmental Engineering (or equivalent Engineering degree) must take the courses listed in the Prerequisite section of the manual (p. 2) in addition to the ENVE core.

There are five steps to be completed towards a Ph.D. degree:

(1) Approval of graduate program of study
(2) Oral qualifying examination
(3) Preliminary examination
(4) Final oral examination
(5) Thesis submission

DOCTORAL COMMITTEES

1. 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.

2. The committee consists of at least 5 members:
    - the student's major professor;
    - two other CBEE faculty members;
    - 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 (GCR).

    Note that the composition of a student's Doctoral Committee MUST be approved by the major professor.

3. 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 committee meeting, the oral preliminary exam, and the final examination (dissertation defense). Information on the GCR can be found at:

    https://gradschool.oregonstate.edu/current-students/graduate-committee#council

4. The Committee should be appointed after successful completion of the qualifying exam.

MATRICULATION

1. Matriculation (first term of attendance) qualifies the student to:
    a. select a general area of dissertation research;
    b. identify a major professor

2. After matriculation, the student must pass a qualifying examination (described below).

QUALIFYING EXAMINATION FOR DOCTORAL STUDENTS

The ENVE qualifying examination will take place during a student's second year in the ENVE Ph.D. program. Students will receive assignments on September 1st and the examination will be scheduled to take place the first week of fall quarter. Any exceptions or changes to this timing should be discussed with the Graduate Program Coordinator in consultation with the ENVE faculty.

Each student will receive a research article from the current literature, chosen by their respective research advisor. This examination will consist of written and oral components and evaluation is based on two equally important elements: (1) student critique of that paper, and (2) the depth of student

understanding of the relevant fundamental science.

The oral examination consists of two parts, totaling 80 minutes.

1. An oral presentation of the critique of the paper. Each student is expected to address the following four items in their individual presentation:
    a. Present the scientific content in the article, providing critical evaluation of the hypothesis, assumptions, methods, and conclusions of the authors;
    b. Perform a literature survey relevant to the content of the article that places the assigned article into the context of work in the field;
    c. Connect the content of the assigned article to basic core ENVE course material; and
    d. Propose an extension of the core ideas or work to a future application in the field.

    Student presentations will be strictly limited to 40 minutes (notified at 35 minutes, cut off at 40 minutes). Students should practice their talk and use of associated equipment so that this time is used efficiently. The critique need not be negative; you may have an excellent paper to discuss. In your critique, you should demonstrate a depth of thinking about the research strategy and the fundamental chemical, physical, and/or biological concepts that govern the behavior of the system being studied.

2. A question and answer period consisting of questions pertaining to the research field or the specifics of the paper. The questions will probe your depth of thinking about the research strategy and the fundamental chemical, physical, and/or biological concepts that govern the behavior of the system being studied. This section of the exam should not exceed 40 minutes.

The written portion of the exam consists of a <u>two-page written summary</u> of your critique that includes the four elements described in (1).

Preparation for the examination must represent a student's *individual effort*. However, students may have general discussions with other students and are encouraged to practice their talk in front of other students; for example, at a GSA-organized practice session. Students should document any discussions that they have with other students in the form of an "Acknowledgements Section" at the end of their presentation. Students should refrain from contacting the authors of their assigned paper and any faculty.

With respect to assessment, students will be scored on the following competences:

1. Ability to present the core scientific content in the assigned article;
2. Ability to think critically about hypothesis, assumptions, methods, and conclusions in the assigned article;
3. Ability to place the assigned article in the context of associated background literature
4. Ability to connect content in the assigned article to relevant core material in your research area;
5. Ability to propose an extension of the core ideas and/or methods in the assigned article to a future application;
6. Ability to communicate an understanding of the core curriculum related to your research area in response to questions in the Q&A session; and

7. Ability to communicate the requested content in a written summary.

Qualifying examinations will be evaluated by the research advisor and two additional members of the ENVE faculty.

If the student fails the examination, one additional attempt will be allowed.

At the discretion of the research advisor, with the support of the ENVE faculty, the successful defense of an M.S. degree in Environmental Engineering at OSU can substitute for the Ph.D. qualifying examination.

CANDIDACY

To advance to candidacy, PhD students must successfully complete the preliminary examination.

PRELIMINARY EXAMINATIONS FOR DOCTORAL STUDENTS

There are two components to preliminary examinations completed as part of a Ph.D. degree in Environmental Engineering: (1) the Written Preliminary Examination, and (2) the Oral Preliminary Examination.

The written preliminary exam followed by an oral defense is intended to evaluate a Ph.D. student's ability to utilize scientific literature, to think critically, to write creatively, to articulate ideas, and to demonstrate understanding of his/her specific field of study. The oral part of this examination will also evaluate the student's breadth of knowledge in areas of broader focus, yet related to the area of research. Generally, the oral part of the exam will begin with a 30-45 minute presentation by the student, in which he/she presents her research, and thus, the content of the written report. This will be followed by a question and answer session in which the committee can address both the research itself and also more general knowledge. Preliminary exams should be scheduled for ***at least two hours.***

WRITTEN PRELIMINARY EXAMINATION

The Written Preliminary Exam must be completed prior to the Oral Preliminary Exam. Students must write a proposal on their thesis topic and distribute it to their doctoral committee members at least ***one week prior*** to the date of the Oral Preliminary Exam.

Guidelines for the Written Research Proposal

This examination will also test the student's ability to develop, investigate, and defend their original research idea. The originality, scholarly quality, and the technical feasibility of the research proposal will be evaluated.

The format of the written research proposal required for the Preliminary Exam is as follows.

1. The report is intended to contain a summary of the student's research, to demonstrate knowledge in the area of research, progress so far, expected results, and a timeline for completing the research and thus to graduation.
2. This 'report' style document should contain an introduction; literature review; outline of major hypotheses; discussion of methods that will be used to test the hypotheses; preliminary findings up to the point of the exam; a summary; and a timeline indicating roughly when key elements of the research will be completed. Such a report would likely serve as a basis for the first several chapters

of the Ph.D. candidate's dissertation.

3. The written research proposal is *limited to fifteen single-spaced pages* (including references, timeline, etc.)
4. While it is expected that the student will consult with and discuss the various elements of this proposal with their research advisor, the intent is that the writing and presentation are a primarily product of the student and that they are responsible for justifying and defending their proposed work.

ORAL PRELIMINARY EXAMINATION

The Oral Preliminary Examination is conducted by the student's doctoral committee and should cover the student's knowledge in his/her major and minor subjects. The examination consists of an oral defense of the proposal submitted in the Written Preliminary Examination on the student's proposed research topic. However, no more than one-half of the time should be devoted to specific aspects of the thesis project. The first part of the examination (i.e., the presentation and defense of the student's thesis proposal) is generally presented as a seminar to the student's doctoral committee. This portion should last no longer than 30 to 45 minutes. The committee will then ask questions relating to the thesis proposal, the student's course work, or the student's research. All members of the doctoral committee, including the GCR, are expected and encouraged to participate in examining the student. No committee member should be allowed to monopolize the examination, and the student must be given an adequate and fair opportunity to respond to the questions. The exam scoring rubric can be found in the appendix.

The examination will be scheduled for ***at least two hours***, and the examination date must be scheduled with the Graduate School ***at least two weeks in advance***.

If more than one negative vote is recorded by the examining committee, the candidate will have failed the oral examination. Only one re-examination is permitted.

At least one complete academic term must elapse between the time of the Oral Preliminary Examination and the Final Oral Examination. If more than five years elapse between these two examinations, the candidate must take another Oral Preliminary Examination.

FINAL ORAL EXAMINATIONS

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 with the Graduate School ***not less than two weeks*** prior to the date of the examination. The final oral examination information must submitted to the Graduate Program Coordinator for announcement in the School of Chemical, Biological, and Environmental Engineering ***no less than two week*****s** prior to the examination date.

The thesis defense 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 the field of study and the evaluation of the candidate's performance. The oral final examination should be scheduled for ***at least two hours***.

The student is expected to display a mastery of knowledge in his/her field and professional maturity as

an Environmental Engineer. In the oral examination, the candidate is expected to defend the thesis 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. The exam scoring rubric can be found in the appendix.

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.

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**.

DOCTORAL DISSERTATION

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 contribution to 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 OSU Graduate School's *Thesis Guide: Preparing a Thesis or Dissertation* can be accessed electronically here: https://gradschool.oregonstate.edu/sites/gradschool.oregonstate.edu/files/2021-08/thesisguide2022-v2.pdf.

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/.

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 thesis 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, upload one PDF copy of your 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. If final submission requirements are 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 (http://gradschool.oregonstate.edu/success/thesis-guide).

Signatures on the ETD submission approval form can be electronic, signed, scanned and emailed or faxed. The thesis will not be accepted for graduate requirements until it has received approval by the graduate dean, which the thesis editor will obtain.

Within ***six weeks*** of the final oral examination, one printed copy of your thesis must be submitted to the School of CBEE main office for binding and archiving in the CBEE thesis library.

PROCEDURES LEADING TO THE DOCTORAL DEGREE

Below 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	End of second term
	2	Establish general area of dissertation research	
	3	Take Oral Qualifying Exam	Beginning of fall of second year
	4	Generate Grad Council Rep (GCR) list and contact those people until you find someone willing to serve as your GCR	By winter term of your second academic year
	5	Schedule doctoral program meeting with all committee members; reserve a room with CBEE Office Coordinator	
	6	Doctoral program meeting: Print GCR Checklist and take to the meeting	
	7	File Doctoral Program of Study	
	8	Schedule the Preliminary Oral Examination with your committee (one hour)	AT LEAST 2 weeks prior to preliminary oral examination
	9	Reserve a room in CBEE with the Office Coordinator for the Preliminary Oral Examination	
	10	Review the PhD Preliminary Oral Examination Scoring Rubric (see Handbook appendix)	
	11	Complete and Submit Exam Scheduling Form	
	12	Complete preliminary oral examination	Spring Term, Second Year
	13	Hold regular meetings with your Committee to keep them updated on your progress	Throughout your degree progression (at least once a year)
	14	Read the Thesis Guide on the Grad School's website	Prior to starting your dissertation
	15	Present Project Poster at Graduate Visit Wkend	Winter Term, Third Year
	16	Compare Doctoral Program of Study form and transcripts for consistency	1 term before your intended graduation term
	17	File Petition to Change Program form if needed.	
	18	Present Research in Graduate Seminar (CBEE 507)	Any Term, Fourth Year
	19	File a Diploma Application	15 weeks prior to final oral examination
	20	Complete final draft of your dissertation and submit it to your major professor for review and approval	By the start of your last term
	21	Schedule the final oral examination w/your committee	AT LEAST 2 weeks prior to final oral examination
	22	Reserve a room with CBEE Office Coordinator	
	23	Review CBEE Scoring Rubric & Graduate Learning Outcomes (see Handbook appendix)	
	24	Complete Exam Scheduling Form	

	25	Submit thesis pretext pages to the Graduate School	
	26	Submit a final draft dissertation to all committee members (with advisor's approval)	
	27	Confirm final oral examination appointment with the Grad School (make sure it's on their calendar!)	1 week after submitting exam scheduling form
	28	Submit final oral examination appointment to Graduate Program Coordinator for announcement circulation	AT LEAST 2 weeks prior to final oral examination
	29	Remind (e-mail) Committee of the final oral examination	2 days prior to final oral examination
	30	Complete final oral examination	(At least one full term must elapse between completion of the preliminary examination and the final examination)
	31	Submit final copies (See Submission Instructions)	Within 6 weeks of the exam or by the first day of the Next term, whichever is first; if you miss the deadline, you will be required to register for an additional 3 credits, no exceptions!
	32	Print copy of dissertation for School binding; submit to CBEE Office Coordinator.	
	33	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 –

You should work with your advisor to fill out your Program of Study form *before* you hold your doctoral program meeting because your committee needs to approve the Program of Study before you can submit it to the Graduate School.

For various reasons, changes often occur in the classes that you plan to take and what you actually need to earn your degree. When you graduate, the Program of Study must be 100% accurate. You should compare the program on file with your transcripts, which can be viewed by logging into Student Online Services. Make corrections by filling out the **Petition to Change the Program of Study form** **at least one term before you plan to defend.** You do not have to revise the above form each time you deviate from your original program; however, you must to **keep your committee informed of any and all changes**, since they are the ones who must approve your Program.

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.

Appendices

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 (e.g., 0.2) from _____ (Source of Funds) starting on _____ (Starting Date) (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 Environmental Engineering

Year 1		
Fall	Winter	Spring
CBEE 507 Grad Seminar Prof. Dev. **AND** ENGR 520 MENG Portfolio Prep 2 cr		ENGR 521 MENG Portfolio Completion 1 cr
ENVE 532 Aqueous Chem 4 cr	ENVE 541 Microbial Proc in Env. Syst. 4 cr	ENVE 535 Phys & Chem Proc for ENVE 4 cr
ENVE 536 Aq Chem Lab 1 cr	ENVE 531 Transp & Fate Organic Chem or Gen Engr Elect 3-4 cr	ENVE 525 Air Pollution or Gen Engr Elect 4 cr
CHE 525 CHE Analysis 4 cr		ENVE 556 Sust. Water Res. Engr or Gen Engr Elect 3-4 credits
	Grad Engineering Specific 3-4 cr	Grad Engineering Specific 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 14-17	15-17	15-18

Notes:

MEng ENVE Core (20 cr): CBEE 507(1), ENGR 520/521(2), CHE 525(4), ENVE 532(4), ENVE 536(1), ENVE 535(4), ENVE 541(4)

CBEE 507 Seminar: Professional Development is required for MEng students in the **Fall term. For MEng students, ENGR 520 MENG Portfolio Prep and ENGR 521 MENG Portfolio Completion classes substitute for 2 of the 3 required seminar credits.*

Gen Engineering, 10 credits: **Take 1 of ENVE 525, ENVE 556 or ENVE 531.**

Grad Minor/Elective **(15 cr)**: Any graduate-level course, typically 4-5 courses, These are your most flexible credits. A minor requires 15 credits. (**Slash course 443/543 cannot be taken for graduate credit.)

M.Eng. Degree Curriculum in Environmental Engineering for those without EnvE Engr undergraduate degree

	Year 1			Year 2
	Fall	Winter	Spring	Fall
	CBEE 507 Grad Seminar Prof. Dev. **AND** ENGR 520 MENG Portfolio Prep 2 cr			ENGR 521 MENG Portfolio Completion 1 cr
	ENVE 521 Water & Wastewater Char. 4 cr	ENVE 522 Env Engr Design 4 cr	ENVE 535 Phys & Chem Proc for ENVE 4 cr	CHE 525 CHE Analysis 4 cr
	CE 547 Water Res. Engr I: Fluid Mech 4 cr	ENVE 531 Fate & Transport of Chem in Env. Syst 4 cr	ENVE 525 Air Pollution or Gen Engr Elect 4 cr	Grad Minor or Elective 3-4 cr
			ENVE 556 Sust. Water Res. Engr Or Gen Engr Elect 3-4 credits	
	ENVE 532 Aqueous Chem 4 cr	ENVE 541 Microbial Proc in Env. Syst. 4 cr	Grad Minor or Elective 3-4 cr	Grad Minor or Elective 3-4 cr
	ENVE 536 Aq Chem Lab 1 crt			
TOTAL	14	13	13	12

Notes: **MEng ENVE Core (20 cr): CBEE 507(1), ENGR 520/521(2), CHE 525(4), ENVE 532(4), ENVE 536(1), ENVE 535(4), ENVE 541(4)**

CBEE 507 Seminar: Professional Development is required for MEng students in the **Fall term. For MEng students, ENGR 520 MENG Portfolio Prep and ENGR 521 MENG Portfolio Completion classes substitute for 2 of the 3 required seminar credits.*

Gen Engineering, 10 credits: **Take 1 of ENVE 525, ENVE 556 or ENVE 531.**

ENVE 521 and 522 do not count toward the 45 credits required for graduation.

Grad Minor/Elective **(15 cr)**: Any graduate-level course, typically 4-5 courses. A minor requires 15 credits.

**Slash course 443/543 cannot be taken for graduate credit.

M.S. Degree Curriculum in Environmental Engineering

	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 Presentations. 1 cr	CBEE 507 Grad Seminar Presentations. 1 cr	CBEE 507 Grad Seminar Presentations. 1 cr
	CHE 525 CHE Analysis 4 cr	ENVE 541 Microbial Proc in Env. Syst. 4 cr	ENVE 535 Phys & Chem Proc for ENVE 4 cr	ENVE 503 MS Thesis Variable 1-12 cr	ENVE 503 MS Thesis Variable 1-12 cr	ENVE 503 MS Thesis Variable 1-12 cr
	ENVE 532 Aqueous Chem 4 cr	Grad Engineering Specific 3-4 cr	Grad Engineering Specific 3-4 cr			
	ENVE 536 Aq Chem Lab 1 cr					
	Grad Minor or Elective 3-4 cr	Grad Minor or Elective 3-4 cr	Grad Minor or Elective 3-4 cr			
TOTAL	12-14	12	12	12	12	12

Notes: **ENVE Core (20 cr): CHE 507 (3), CHE 525 (4), ENVE 532 (4), ENVE 536 (1), ENVE 535 (4) ENVE 541(4)**

CBEE 507 Seminar: Professional Development, is required for all 3 terms. Students are requested to enroll in CBEE 507 Seminar: Presentations.

M.S. Thesis (9 cr): variable credits, thesis credits can go over 9 units total to meet GTA/GRA requirements.

Graduate Electives/Minor **(15 cr)**: Any graduate-level course, typically 4-5 courses. These are your most flexible credits. A minor consists of 15 credits.

45 credits total required

Year 2: completion time is dependent upon intensity of project

M.S. Degree Curriculum in Environmental Engineering for those without EnvE Engr undergraduate degree

<table>
<tr><td></td><td colspan="3">Year 1</td><td colspan="3">Year 2</td></tr>
<tr><td></td><td>Fall</td><td>Winter</td><td>Spring</td><td>Fall</td><td>Winter</td><td>Spring</td></tr>
<tr><td></td><td>CBEE 507
Grad Seminar
Prof. Dev.
1 cr</td><td>CBEE 507
Grad Seminar
Prof. Dev.
1 cr</td><td>CBEE 507
Grad Seminar
Prof. Dev.
1 cr</td><td>CBEE 507
Grad Seminar
Presentations
1 cr</td><td>CBEE 507
Grad Seminar
Presentations
1 cr</td><td>CBEE 507
Grad Seminar
Presentations
1 cr</td></tr>
<tr><td></td><td>ENVE 521
Water &
Wastewater
Char.
4 cr</td><td>ENVE 522
Env Engr
Design
4 cr</td><td>ENVE 535
Phys & Chem
Proc for ENVE
4 cr</td><td>CHE 525
CHE Analysis
4 cr</td><td>Grad Minor or
Elective
3-4 cr</td><td rowspan="5">ENVE 503
MS Thesis
Variable
1-12 cr</td></tr>
<tr><td></td><td>CE 547
Water Res.
Engr I: Fluid
Mech
4 cr</td><td>ENVE 531
Fate &
Transport of
Chem in Env.
Syst
4 cr</td><td rowspan="2">ENVE 556
Sust. Water
Res. Engr
Or
Gen Engr Elect
3-4 cr</td><td rowspan="2">Grad Minor or
Elective
3-4 cr</td><td rowspan="3">ENVE 503
MS Thesis
4-5 cr.</td></tr>
<tr><td></td><td rowspan="2">ENVE 532
Aqueous
Chem
4 cr</td><td rowspan="3">ENVE 541
Microbial Proc
in Env. Syst.
4 cr</td></tr>
<tr><td></td><td>Grad Minor or
Elective
3-4 cr</td><td>ENVE 503
MS Thesis
4-5 cr.</td></tr>
<tr><td></td><td>ENVE 536
Aq Chem Lab
1 cr</td></tr>
<tr><td>TOTAL</td><td>14</td><td>13</td><td>13</td><td>12</td><td>12</td><td>12</td></tr>
</table>

Notes: **ENVE Core (20 cr): CHE 507 (3), CHE 525 (4), ENVE 532 (4), ENVE 536 (1), ENVE 535 (4) ENVE 541(4)**

CHE 507 Seminar: Professional Development, is required for all 3 terms. Students are requested to enroll for CBEE 507 Seminar: Presentations.

M.S. Thesis (9 cr): variable credits, thesis credits can go over 9 units total to meet GTA/GRA requirements.

Grad Minor/Elective **(15 cr)**: Any graduate-level course, typically 4-5 courses, These are your most flexible credits. A minor requires 15 credits.

45 total credits required.

PhD. Degree Curriculum in Environmental Engineering

	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
	CHE 525 CHE Analysis 4 cr	ENVE 541 Microbial Proc in Env. Syst. 4 cr	ENVE 535 Phys & Chem Proc for ENVE 4 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr
	ENVE 532 Aqueous Chem 4 cr	ENVE 531 Transp & Fate Organic Chem or Gen Engr Elect 3-4 cr	Grad Engr Specific 3-4 cr						
	ENVE 536 Aq Chem Lab 1 cr	Grad Engr Specific 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	12-14	12	12	12	12	12	12	12	12

Notes: **ENVE Core (20 cr): CHE 507, CHE 525, ENVE 532 (4), ENVE 536 (1), ENVE 535 (4) ENVE 541(4)**
CHE 507 Seminar is required for all 3 terms. Students are requested to take CBEE 507, Presentations each term

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

Graduate Minor (15 cr): Any graduate-level course, typically 4-5 courses, These are your most flexible credits.

Year 3-6: completion time is dependent upon intensity of project

108 Total credits required

Ph.D. Degree Curriculum in Environmental Engineering for those without previous EnvE Engr degrees

	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
	ENVE 521 Water & Wastewater Char. 4 cr	ENVE 522 Env Engr Design 4 cr	ENVE 535 Phys & Chem Proc for ENVE 4 cr	CHE 525 CHE Analysis 4 cr	Grad Minor or Elective 3-4 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr	ENVE 603 PhD Thesis Variable 1-12 cr
	CE 547 Water Res. Engr I: Fluid Mech 4 cr	ENVE 531 Fate & Transport of Chem in Env. Syst 4 cr	Grad Minor or Elective 3-4 cr	Grad Minor or Elective 3-4 cr	ENVE 603 PhD Thesis 4-5 cr.				
	ENVE 532 Aqueous Chem 4 cr	ENVE 541 Microbial Proc in Env. Syst. 4 cr	Grad Minor or Elective 3-4 cr	ENVE 603 PhD Thesis 4-5 cr.					
	ENVE 536 Aq Chem Lab 1 cr								
TOTAL	14	13	13	12	12	12	12	12	12

Notes **ENVE Core (20 cr): CHE 507, CHE 525, ENVE 532 (4), ENVE 536 (1), ENVE 535 (4) ENVE 541(4)**
CBEE 507 Seminar, Prof. Development, is required for all 3 terms. CBEE 507 Seminar, Presentations, is requested each term.

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

Grad Minor/Elective (15 cr): Any graduate-level course, typically 4-5 courses. These are your most flexible credits. A minor typically requires 15 credits.

108 Total credits required

ATTACHMENT 2
Scoring Guide (Rubric) for Graduate Learning Outcome Assessment
MS THESIS and FINAL ORAL EXAM in ENVIRONMENTAL ENGINEERING

Candidate Name: _____ Date: _____
Title of Examination Document: _____
Name 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.

During the examination process I did not perceive any lapses in ethical performance and/or reporting of research:

Signature of Examiner: _____

Examiner: Please use the reverse of this form for written commentary as needed.

Assessment Guide for Ph.D. Qualifier Presentation in Environmental Engineering

Student Name: _____ Faculty Reviewer: _____ Date: _____

Competence	Poor	Satisfactory	Strong
Ability to present the scientific content in the assigned article	Disorganized presentation and poor speaking skills	Adequately organized presentation that has a logical flow and satisfactory speaking skills	Well-organized presentation and strong speaking skills
Ability to think critically about hypothesis, assumptions, methods, conclusions in the assigned article	Hypothesis, assumptions, methods, and conclusions are not clearly or incorrectly identified	Hypothesis, assumptions, methods, and conclusions are adequately identified	Hypothesis, assumptions, methods, and conclusions are clearly and correctly identified
Ability to place the assigned article in the context of associated background literature	Background literature is presented in a disconnected, disjointed manner or an insufficient knowledge of the background literature is exhibited	Adequate background literature is presented to place the work of the assigned article in context, though some references known to experts in the field may be missing or some knowledge associated with a critical reference presented may be lacking	Complete and clear presentation of the background literature and a demonstrated understanding of how the assigned article fits into the research field
Ability to connect content in the assigned article to relevant core material in the student's research area	Science and engineering principles underlying research in the assigned article are not correctly identified	Science and engineering principles underlying research in the assigned article are identified with some minor issues	Science and engineering principles underlying the research in the assigned article are correctly identified
Ability to propose an extension of the core ideas and/or methods in the assigned article to a future application	Proposed extension lacks creativity and an understanding of the needs of the field	Proposed extension shows some creativity and some understanding of the needs of the field	Proposed extension demonstrates a high level of creativity and a good understanding of the needs of the field
Ability to communicate an understanding of core curriculum in the student's research area in response to questions in the Q&A session	Answers to questions show weakness in depth of knowledge in subject matter and/or poor critical thinking skills	Answers to questions show adequate knowledge in subject area and satisfactory critical thinking skills	Answers to questions show superior knowledge in subject area and well-developed critical thinking skills
Ability to communicate the requested content in a written summary	Disorganized and poor writing/grammar	Adequately organized with logical flow and satisfactory writing/grammar	Well-organized and strong writing skills

Pass:_____ Conditional Pass:_____Fail: _____
Please provide additional comments on back if needed.

ATTACHMENT 3
Scoring Guide (Rubric) for Graduate Learning Outcome Assessment
PhD PRELIMINARY or FINAL ORAL EXAM in ENVIRONMENTAL ENGINEERING

Type of Examination (please circle one): **PRELIMINARY ORAL EXAM** **FINAL ORAL EXAM**

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	Disorganized and too brief to adequately explore the topic; widely known technical references clearly missing or not germane to the topic at hand	Logically crafted and adequately explores the topic; some references known to experts in the field may be missing,	Fully explores the topic and illustrates the state of the knowledge in the field, may be missing an obscure reference or two
2. Ability to Demonstrate a Creative Solution to the Problem	Proposed concept is well known to be described in technical literature or is impossible/absurd	Proposed work is original and possible but derivative/incremental in nature	Proposed work is original, practical and high-risk/high-payoff
3. Application of Science and Engineering Fundamentals	Science/Engineering principles underlying Research Hypothesis and Objectives not clearly discussed	Science/Engineering principles underlying Research Hypothesis and Objectives discussed	Science/Engineering principles underlying Research Hypothesis and Objectives discussed; as appropriate math models and associated predictions developed
4a. Quality of Written Communication	Profuse grammatical errors, poor sentence construction and/or poor document structuring makes it impossible to read through	Adequate document structure, grammar and writing enables adequate understanding of the material presented	Near publication quality, great reading with minor flaws
4b. Quality of Oral Communication	Disorganized presentation with low real 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

During the examination process I did not perceive any lapses in ethical performance and/or reporting of research:
Signature of Examiner: _____
Examiner: Please use the reverse of this form for written commentary as needed.

Evaluated Graduate Learning Outcomes/Outcomes for PhD, MS, and MEng Programs
Environmental Engineering, College of Engineering

Ph.D. Outcomes	M.S. Outcomes	M.Eng. Outcomes
Outcome 1: 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 Ph.D. Qualifier Examination, Ph.D. Thesis and Final Oral Examination ("Defense").	**Outcome 1: 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 M.S. Thesis and Final Oral Examination.	**Outcome 1: 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.
Outcome 2: Mastery of Subject Material The student will be able to think critically, creatively and to address technical problems in the fields spanned by CBEE. This will be assessed through satisfactory completion of the graduate program of study, as well as course summaries written by the instructors.	**Outcome 2: Mastery of Subject Material** The student will be able to think critically, creatively and to address technical problems in the fields spanned by CBEE. This will be assessed through satisfactory completion of the graduate program of study, as well as course summaries written by the instructors.	**Outcome 2: Mastery of Subject Material** The student will be able to think critically, creatively and to address technical problems in the fields spanned by CBEE. This will be assessed through satisfactory completion of the graduate program of study, as well as course summaries written by the instructors.
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), as well as ethical completion of the Ph.D. Qualifier Examination and the Ph.D. Thesis and Final Oral Examination.	**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), as well as ethical completion of the M.S. Thesis and Final Oral Examination.	**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), as well as ethical completion of the M.Eng. Final Oral Examination.

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 5th term	
Preliminary Exam	End of 2nd 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 5th term	
Preliminary Exam	End of 2nd 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 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 understands my responses.

Major Professor Signature(s) Date

Committee Member Signature(s) (optional) Date

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.

Student Signature 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.

Oregon State University
Graduate School

MASTERS

Check One	☐ EdM	☐ MA	☐ MAPE	☐ MATRN	☐ MCoun	☒ MEng	☐ MF	☐ MFA	☐ MHP	☐ MPP	☐ MS	☐ PSM

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

Academic Unit	CBEE
Major	ENVE
Minor ☐ or Option ☐ (please check one)	
Minor ☐ or Option ☐ (please check one)	

Check One	☒ Non-Thesis	☐ Thesis

CAPSTONE

Transfer Symbol	G*	Thesis (6-12 credits) If applicable	Course Dept.	Course No.	Cr.	Gr.
				503		

Transfer Symbol	G*	Non-Thesis Project, Research or PSM Internship (3-6 credits) If applicable	Course Dept.	Course No.	Cr.	Gr.
	G	Research	ENVE	501	1	
				505		
				506		
				510		
				Total	1	

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	4
d. Total 4XX/5XX Program Credits	10
e. Total Graduate Standalone Credits	35
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 Major Courses	Course Dept.	Course No.	Cr.	Gr.
	G	Sem/Prof Develop.	CBEE	507	3	
	G	Water Res/Fluids	CE	547	4	
	G	Micro Proc in Enve	ENVE	541	4	
		Transp & Fate	ENVE	531	4	
	G	Intro to Num Meth	CHE	581	3	
	G	Groundwater Rem	ENVE	554	4	
		Sustain. Water Res	ENVE	556	3	
	G	Phys & Chem Proc	ENVE	535	4	
		GIS in Water Res	CE	513	3	
	G	Aqueous Chem	ENVE	532	4	
	G	Aq Chem Lab	ENVE	536	1	

If additional lines are needed, use a second form — Total 45

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

If additional lines are needed, use a second form — Total

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

If additional lines are needed, use a second form — Total

Transfer courses indicated above:

Transfer Symbol	University
T1	
T2	
T3	

Oregon State University
Graduate School

MASTERS

Check One	☐ EdM	☐ MA	☐ MAPE	☐ MATRN	☐ MCoun	☒ MEng	☐ MF	☐ MFA	☐ MHP	☐ MPP	☐ MS	☐ PSM

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

Academic Unit	
Major	
Minor ☐ or Option ☐ (please check one)	
Minor ☐ or Option ☐ (please check one)	

Check One	☒ Non-Thesis	☐ Thesis

CAPSTONE

Transfer Symbol	G*	Thesis (6-12 credits) If applicable	Course Dept.	Course No.	Cr.	Gr.
				503		

Transfer Symbol	G*	Non-Thesis Project, Research or PSM Internship (3-6 credits) If applicable	Course Dept.	Course No.	Cr.	Gr.
		Research	ENVE	501	1	
				505		
				506		
				510		
				Total	1	

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)	

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

Transfer Symbol	G*	Title of Major Courses	Course Dept.	Course No.	Cr.	Gr.
	G	Storm Water Design	CE	540	3	
	G	CHE Analysis	CHE	525	4	

If additional lines are needed, use a second form — **Total** 45

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

If additional lines are needed, use a second form — **Total**

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

If additional lines are needed, use a second form — **Total**

Transfer courses indicated above:

Transfer Symbol	University
T1	
T2	
T3	

Revised March 2018

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			
		Signature	*Date*
APPROVED - Major Professor			
	Typed Name	*Signature*	*Date*
APPROVED - Chair, Academic Unit			
	Typed Name	*Signature*	*Date*
APPROVED – Minor Professor			
	Typed Name	*Signature*	*Date*
APPROVED – Graduate Council Representative			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member			
	Typed Name	*Signature*	*Date*
APPROVED - Graduate School			
		Signature	*Date*

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

Oregon State University
Graduate School

MASTERS

Check One	☐ EdM	☐ MA	☐ MAPE	☐ MATRN	☐ MCoun	☐ MEng	☐ MF	☐ MFA	☐ MHP	☐ MPP	☒ MS	☐ PSM

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

Academic Unit	CBEE
Major	Environmental Engineering
Minor ☐ or Option ☐ (please check one)	
Minor ☐ or Option ☐ (please check one)	

Check One	☐ Non-Thesis	☒ Thesis

CAPSTONE

Transfer Symbol	G*	Thesis (6-12 credits) If applicable	Course Dept.	Course No.	Cr.	Gr.
	G	Thesis	ENVE	503	9	

Transfer Symbol	G*	Non-Thesis Project, Research or PSM Internship (3-6 credits) If applicable	Course Dept.	Course No.	Cr.	Gr.
				501		
				505		
				506		
				510		
				Total	9	

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 (or Grad 520)

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	6
e. Total Graduate Standalone Credits	39
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 Major Courses	Course Dept.	Course No.	Cr.	Gr.
	G	Chem Engr Analys	CHE	525	4	
	G	Aqueous Chem	ENVE	532	4	
	G	Aq Chem Lab	ENVE	536	1	
	G	Sem. Prof Dev	CBEE	507	3	
	G	Microb Processes	ENVE	541	4	
	G	Phys & Chem Proc	ENVE	535	4	
		Microbial Eco (elec)	MB	548	3	
	G	Biosyst Model(elec)	BEE	529	3	
	G	Stormwtr Model(elec)	CE	540	3	
		ArcGIS in Wtr Res (elec)	CE	513	3	
	G	Groundwtr Rem (elec)	ENVE	554	4	

If additional lines are needed, use a second form — Total 36

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

If additional lines are needed, use a second form — Total

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

If additional lines are needed, use a second form — Total

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:

20. The correct degree is indicated in the first row. Please refer to and attach an unofficial copy of your transcript.
21. Student name, phone, ID number, email address, degree held, year the degree was awarded, and institution from which it was received are filled in.
22. The academic units, majors, and thesis or non-thesis are indicated.
23. 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.
24. 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.
25. The maximum number of blanket numbered credits is 24 on a 60 credit degree program or 9 on a 45 credit degree program.
26. A transfer symbol is indicated for each transfer course (T1 for the first university, T2 for the second, etc.)
27. 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.
28. 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.
29. 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.)
30. For each standalone graduate course a G is entered in the G column.
31. 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.
32. Grades of non-transfer courses listed on this program will be either C or above, or P, or R for research.
33. The total number of credits at the 4XX/5XX level is entered and the number of 5XX or 6XX credits is entered.
34. 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.
35. 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.
36. Your total number of credits must be at least 45. (Your major/track may require more credits—check with them.)
37. 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.
38. 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.

22. 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.
23. The program of study must be signed by the student, all committee members, and the academic unit chair.

Student's Signature			
		Signature	*Date*
APPROVED - Major Professor			
	Typed Name	*Signature*	*Date*
APPROVED - Chair, Academic Unit			
	Typed Name	*Signature*	*Date*
APPROVED – Minor Professor			
	Typed Name	*Signature*	*Date*
APPROVED – Graduate Council Representative			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member			
	Typed Name	*Signature*	*Date*
APPROVED - Graduate School			
		Signature	*Date*

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

Oregon State University

Graduate School
Heckart Lodge
2900 SW Jefferson Way
Corvallis, OR 97331

DOCTORAL DEGREE

Check One	☐ PhD	☐ 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 ☐ or Option ☐	
Major		Second Minor ☐ or Option ☐	

(Please check one)

Transfer Symbol	G*	Title of Major Courses	Course Dept.	Course No.	Cr.	Gr.
	G	Chem. Eng. Analysis	CHE	525	4	
	G	Aquatic Chemistry	ENVE	532	4	
	G	Phys Chem Process	ENVE	535	4	
	G	Aq. Env. Chem Lab	ENVE	536	1	
	G	Microbial Processes	ENVE	541	4	
	G	Seminar Prof Dev	CBEE	507	3	
	G	Groundwater Rem	ENVE	554	4	
		Fate & Trans Chem	ENVE	531	4	
T1	G	Eng Ed Foundation	CHE	599	3	
	G	Elect. Props. Mats	MATS	571	4	
	G	ST. Heterog. Catal.	CHE	599	3	
T1	G	Course Design	GRAD	561	3	
T1	G	Theories of Teach	GRAD	560	3	
	G	Thesis	ENVE	603	64	

If additional lines are needed, use a second form **Total**

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

If additional lines are needed, use a second form **Total**

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

If additional lines are needed, use a second form **Total**

Transfer courses indicated above:

Transfer Symbol	University
T1	OSU GCCUT
T2	
T3	
T4	

a. Total Major Hours	
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	4
f. Total Graduate Standalone Credits	104
TOTAL CREDITS ON PROGRAM (e+f)	108

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

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	

Revised October 2017

Oregon State University

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			
		Signature	*Date*
APPROVED - Major Professor			
	Typed Name	*Signature*	*Date*
APPROVED - Chair, Academic Unit			
	Typed Name	*Signature*	*Date*
APPROVED – First Minor Professor			
	Typed Name	*Signature*	*Date*
APPROVED – Second Minor Professor			
	Typed Name	*Signature*	*Date*
APPROVED – Graduate Council Representative			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member (if no minor)			
	Typed Name	*Signature*	*Date*
APPROVED – Committee Member (if no minor)			
	Typed Name	*Signature*	*Date*
APPROVED - Graduate School			
		Signature	*Date*

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