



University of Connecticut

Environmental Engineering Program GRADUATE STUDENT HANDBOOK

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1. INTRODUCTION

In a world undergoing rapid urban and ecological transformation, the role of environmental engineers has become increasingly prominent, as evidenced by the increasing demand among private companies and government agencies for qualified and competent environmental engineers on their staff. The Bureau of Labor Statistics (BLS) provides details information on salaries and employment outlook for environmental engineers in the United States (<http://www.bls.gov/oes/current/oes172081.htm>) and indicates that the projected job growth over the next decade will be faster than the average growth of all occupations.

A typical definition for Environmental Engineering is that it involves “Research, design, plan, or perform engineering duties in the prevention, control, and remediation of environmental hazards using various engineering disciplines” (BLS, 2014). We promote environmentally sustainable human activity by providing engineering solutions that minimize adverse impacts on the natural environment, and by devising effective strategies for resource recapture, reuse, and cleanup. Environmental engineers help prevent pollution and improve the health and safety of all species through the design of pollutant collection and treatment processes for air, water, wastewater, and solid and hazardous wastes.

The Graduate Environmental Engineering Program at UConn goes beyond the traditional scope and addressing the pressing challenges of water management, climate change and associated natural hazards, and the need for renewable energy sources. UConn ENVE faculty have multidisciplinary backgrounds and conduct research in areas as diverse as contaminant fate and transport, groundwater hydrology and geophysics, air pollution, climate change and natural hazards, water resources management and public health, microbial fuel cells and solar energy. The graduate programs offered thus reflect this multidisciplinary nature, incorporating elements of these areas in the course offered and potential topics for research.

The purpose of this handbook is to provide information to prospective and current graduate students in the Environmental Engineering Program with respect to the following topics:

- Admission process and requirements
- Financial aid possibilities and provisions
- Degree requirements and course offerings
- Laboratory training and key access policies
- Information on ethics in research and publishing

2. ADMISSIONS

2.1 Graduate School Requirements

- Baccalaureate degree or its equivalent from a regionally accredited college or university.
- GPA 3.0 for the undergraduate degree
- English proficiency for international students, minimum of 79 for TOEFL and 6.5 for IELTS. All teaching assistants for whom English is not a native language must pass an oral English proficiency test regardless of citizenship or visa status.

Check the Graduate School website for a complete list of requirements

<http://grad.uconn.edu/admissions/requirements/>

2.2 Program Requirements

Admission to M.S. Program

- Must hold an accredited undergraduate degree in engineering or related field with a minimum GPA of 3.0
- Minimum GRE: Verbal – 150 Quantitative – 155 Analytical – 4.0

Admission to the Ph.D. Program

A M.S. degree in Environmental Engineering or related field is desired for admission to the Ph.D. program. Direct admission into the Ph.D. program with only a B.S. degree is possible with the following provisions:

- GPA of 3.5 or higher OR
- Demonstration of previous research experience

Students in the Ph.D. program that do not hold a previous M.S. degree may be awarded an M.S. during their studies after passing their qualifying exam, completion of 30 credits on an approved Ph.D. plan of study, and recommendation by their major advisor.

Remedial courses for students with non-engineering background

Students with non-engineering degrees that are admitted to the MS program have to take or demonstrate proficiency in the following courses:

- ENVE 3120 Fluid Mechanics
- MATH 2410Q Differential Equations
- Additional undergraduate ENVE courses (up to 3) as determined by the Graduate Admissions Committee

The remedial courses will NOT count towards the graduate degree.

2.3 Application Process

All applications for graduate study at UConn must be submitted using our online application system. Visit the Graduate School website for additional details

<https://grad.uconn.edu/admissions/>

In general, the following documentation is required

- Official transcript of the undergraduate degree, including a copy of the title and the courses and grades. Translations must be provided for transcripts from foreign institutions.

- Statement of purpose: indicate the type of research you wish to pursue, your expertise in that area and any particular advisor you wish to work with (not required but recommended).
- Three letters of recommendation from professors or recent employers.
- GRE scores (waived for UCONN graduates)
- TOEFL/IELTS scores, if applicable

The deadline for applications to the M.S. and Ph.D. programs is January 1st for fall admissions and October 15th for spring admissions.

3. FINANCIAL AID

Financial aid may be offered in the form of Graduate Assistantships. An assistantship is awarded to a graduate student who provides teaching (teaching assistantship: TA) or research (research assistantship: RA) support to his/her academic program. In recognition of this support, the tuition and a portion of health care (but not fees) are provided by the grant/contract funding agency or through the University. Additional information is provided by the Graduate School: <https://grad.uconn.edu/gradfellows/>

Admission to the M.S. or Ph.D. programs does not guarantee the award of financial aid. Assistantships are offered based on availability and merit, with priority given to Ph.D. students, and often depend on funding from individual faculty advisors. Assistantships are awarded on a yearly basis and continuity of funding at the same level is not guaranteed by the program.

Assistantships may be offered at various levels, corresponding to 10, 15 and 20 hours of weekly duties. The level of compensation depends on the level of the student (BS degree, MS degree or equivalent) and is set by University policies on a yearly basis. Summer salary is not covered by assistantships and is provided at the discretion of individual advisors, depending on availability. A minimum GPA of 3.0 is necessary to award and maintain a graduate assistantship. Additional information is available on the Graduate School website: <https://grad.uconn.edu/graduate-assistants/>

The terms for graduate assistantships are regulated by the contract between the university and the Graduate Student Union. Information on the contract and the activities of the Union are provided on their website: <http://www.uconngradunion.org/>. Specific questions not addressed in these two websites may also be directed to the Administrative Assistant of the ENVE program (see Contact Information).

It is important to note that the terms of graduate assistantships and especially research assistantships do not cover the obligations of graduate students towards progressing in their own research, applicable to M.S. Plan A and Ph.D. students. Research credits are earned independently; as a rule of thumb, a Carnegie unit defines a semester unit of credit as equal to a minimum of three hours of work per week for a semester. It is at the discretion of the graduate student and their advisor to agree on the terms and timeline of the research plan and thesis requirements.

In addition to assistantships, travel funds are available to doctoral students who have passed their qualifying exam to participate in professional meetings and present their research. Students may fill out the relevant form found on the Graduate School website (<https://grad.uconn.edu/2021/06/04/conference-participation-award-applications-open/>) which contains detailed instructions.

4. DEGREE PROGRAMS

4.1 Areas of Concentration

The Environmental Engineering Program offers four types of graduate degrees:

- Graduate Certificate in Contaminated Site Remediation
- Master of Science (M.S.) in Environmental Engineering
- Master of Engineering (M.Eng) in Contaminated Site Remediation
- Doctor of Philosophy (Ph.D) in Environmental Engineering

The Graduate Certificate and M.Eng. degrees are offered as distance learning courses through the School of Engineering Continuing Education program (soeprofed.uconn.edu).

The M.S. and Ph.D. degrees are offered in one of three areas of concentration, as described below. It should be noted that the list of courses is indicative; depending on the research focus of a particular student, it is possible that courses from several areas or other programs are used towards the degree. Students should consult with their graduate advisor on course selection. However, it should be demonstrated in the Plan of Study that the selected courses are relevant to the Environmental Engineering discipline. Descriptions for all graduate courses are available in the Graduate Catalog (<https://gradcatalog.uconn.edu/course-descriptions/>).

Detailed information about academic regulations related to all degrees can be found on the Graduate Catalog <https://gradcatalog.uconn.edu/grad-school-info/academic-regulations/>

Atmospheric processes

Students completing this track will gain knowledge in meteorology and atmospheric science, will be able to quantify how species move in the atmosphere, understand climate and its forcings; be able to make atmospheric measurements (meteorological and sampling for gaseous and aerosol pollutants); and obtain knowledge of atmospheric chemical processes. Entering students should have basic quantitative skills (math and statistics) and completed courses in introductory hydrology (large-scale fluid motion) and chemistry. Students that lack sufficient science background may take one of the following undergraduate courses:

- NRE 3145 Meteorology
- NRE 4535 Remote Sensing Image Processing
- GEOG 3400 Climate and Weather

- MARN 3000 Atmosphere and Climate Change

Graduate-level courses in this track include

- ENVE 5090 Remote Sensing (offered as Advanced Topics in ENVE)
- ENVE 5810 Hydrometeorology
- ENVE 5811 Hydroclimatology
- ENVE 5221 Transport and Transformation of Air Pollutants
- NRE 5175 Climate and Environmental Systems modeling
- GEOG 5390 Advanced Physical Geography

Hydrogeosciences & Water Resources Management

Students completing this track will gain knowledge and skills in measurement and modeling of primary hydrologic processes taking place at the atmosphere-surface interface (precipitation, energy balance), related to overland flows and sediment transport, and to vadose zone and groundwater flow and contaminant transport. Students will acquire experience in hydrologic site characterization and monitoring methods. Entering students should have basic quantitative skills (physics, math and statistics) and completed courses in introductory hydrology and geology.

Graduate-level courses in this track include

- ENVE 5810 Hydrometeorology
- ENVE 5811 Hydroclimatology
- ENVE 5812 Ecohydrology
- ENVE 5821 Vadose Zone Hydrology
- ENVE 5830 Groundwater Flow Modeling
- ENVE 5850 Sustainable and Resilient Water Governance and Management
- ENVE 5330 Probabilistic Methods in Engineering Systems
- ENVE 5331 Predictive Analytics for Scientists and Engineers
- ENVE 6810 Advanced Fluid Mechanics
- NRE 5165/GSCI 5710 - Advanced Ground Water Hydrology
- NRE 5135 - Water Transport in Soils
- NRE 5115 - Field Methods in Hydrogeology

- GEOG 5505 - Remote Sensing of Marine Geography
- MARN 5030 - Chemical Oceanography
- MARN 5032 - Coastal Pollution and Bioremediation
- MARN 5066 - River Influences on the Marine Environment

Contaminant Fate and Resource Recovery

The focus of this track is on the characterization and measurement of chemical, biological, physical and climatological processes that control the fate of contaminants in natural and engineered systems. Such processes also form the basis of technologies for the treatment and remediation of contaminants in aquatic systems and prevent contaminants from harming human health. In addition, such processes may constitute the basis for technologies that minimize human impact on the environment, including resource recovery and energy production. Students completing this track will gain knowledge and skills that will allow them to identify, quantify, and ultimately control, the biological, geological and chemical reactive processes in the environment in order to restore/maintain soil and water quality, protect human health and minimize resource utilization. Graduate level courses in this track include

- ENVE 5210 Environmental Engineering Chemistry
- ENVE 5211 Environmental Organic Chemistry
- ENVE 5311 Environmental Biochemical Processes
- ENVE 5251 Environmental Physicochemical Processes
- ENVE 5240 Biodegradation and Bioremediation
- ENVE 5252 Environmental Remediation
- ENVE 5530 Geoenvironmental Engineering
- NRE 5155 - Principles of Nonpoint Source Pollution
- NRE 5461 - Landscape Ecology
- NRE 5335 - Advanced Stream Ecology
- CHEM 5336 Electroanalytical Chemistry
- CHEM 5370 - Environmental Chemistry I
- CHEM 5371 - Environmental Chemistry II
- CHEG 5363 Electrochemical Engineering
- CHEG 5395 - Fuel Processing & Fuel Cell (special topics)

- MARN 5030 - Chemical Oceanography
- MARN 5032 - Coastal Pollution and Bioremediation
- PLSC 5410 - Soil Chemistry Components
- PLSC 5420 - Soil Chemistry Reactions and Equilibrium

Course Registration

Detailed information is available on the Office of the Registrar website:

registrar.uconn.edu/registration/. Students should consult with their major advisor prior to the beginning of the semester with respect to course selection. Registration then is facilitated online through the Student Administration System (Peoplesoft). The NetID and associated password are necessary to log into the system. Registration is possible through the tenth day of the fall and spring semesters; however, students are advised to enroll in courses before the first day of classes.

Students on graduate assistantships **MUST** enroll in a minimum of 6 credits; for international students, 9 credits are necessary to maintain full-time status. If students are enrolled in 3 or 6 credits of coursework, they may use GRAD 5950 (Master's Thesis Research for plan A students) or GRAD 6950 (Doctoral Dissertation Research for Ph.D. students) to reach the necessary 9 credits. For students that have completed all coursework, they may use GRAD 5960 Full-time Master's research or GRAD 6960 Full time Doctoral Research to maintain full time status until they complete their thesis/dissertation.

4.2 Master of Science Program Requirements

The two-year M.S. in Environmental Engineering has as its primary objective the development of students' understanding of the subject matter through an emphasis on either research (Plan A) or a comprehensive understanding of a more general nature (Plan B). The M.S. can lead to a professional career in environmental engineering and can be considered a prerequisite for application to Ph. D. programs.

General Provisions

All MS students are required to take the following core courses:

- ENVE 5310 Environmental Transport Phenomena (Spring semester)
- ENVE 5320 Quantitative Methods for Engineers (Fall semester)

The remaining courses may be related to one of the three areas of concentration, as described above. The Graduate School allows for up to 6 credits of 3000 or 4000 level courses that may be counted towards the graduate degree, while all other courses must be at the 5000 or 6000 level.

A Plan of Study must be prepared and signed by the student and the members of the advisory committee and submitted no later than the beginning of their final semester to The Graduate

School. The Master's Plan of Study form is available on the Graduate School website: <https://grad.uconn.edu/enrollment-services/forms/>. All M.S. students have to maintain a GPA of 3.0 to maintain their status in the program. Failure to meet this standard triggers a probationary period of one semester, after which the student is subject to dismissal.

Plan A requirements

A total of 30 credits are required for graduation, with a minimum of 21 credits of coursework in Environmental Engineering or related area and a minimum of 9 credits of Master's Thesis Research (GRAD 5950). A student may enroll in GRAD 5950 credits at any time during the M.S. degree and it is their responsibility to coordinate with their research advisor (and secondarily, with their research committee) on the research plan and requirements for graduation.

A plan A M.S. requires the submission of an M.S. Thesis, in the form of a submission-ready paper manuscript, and an oral defense for graduation. The oral defense fulfills the role of the final examination for the M.S. degree. Two forms have to be submitted to the Graduate School for graduation:

- Master's Thesis checklist
- Report on the Final Examination for the Master's Degree

The thesis has to be submitted to the Library both electronically and in one paper copy, as instructed in the checklist. Guidelines for thesis preparation and electronic submission are available in <https://registrar.uconn.edu/graduation/masters-degrees/#thesis-information> and <https://grad.uconn.edu/forms/>.

The scope, content and length of the M.S. thesis results from the agreement between the research advisor and the student. An advisory committee of at least two additional faculty members will also weigh in on the originality and quality of the thesis prior to graduation. In general, the thesis should present the methodology and results of novel, independent research conducted by the student. Thus, plan A M.S. theses cannot be solely literature reviews or replicate research already published in the scientific literature. As a standard, the M.S. thesis should constitute the basis for a journal paper submission and may be structured as such.

Plan B requirements

A total of 30 credits are required for plan B Master's, with a minimum of 27 credits of coursework in Environmental Engineering or related area. The remaining credits may be used towards additional courses or towards a research project as Graduate Independent Study in Environmental Engineering (ENVE 5020).

The final examination for a plan B Master's is an oral or written exam on three core courses of Environmental Engineering: ENVE 5310 and two additional ENVE courses selected by the student. The oral exam will take place in the final semester before graduation and it will be administered by the advisory committee that will sign the Plan of Study and the Report on the Final Examination.

4.3 M.Eng. Program Requirements

The Master of Engineering (MENG) degree emphasizes improvement of essential technical and professional skills, while a traditional Master of Science degree emphasizes research or a comprehensive understanding of a research area. The Master of Engineering program is designed for practicing engineers who are attending classes in the evenings and on part-time basis. The MENG degree is offered through distance learning courses after regular workhours and with asynchronous content. This affords engineers the opportunity for continuing education without workplace interruptions. Detailed information is available on the website of Continuing and Distance Engineering Education <https://masterofengineering.uconn.edu/>

The program consists of 30 credit hours:

1. 9 credits of Common Core Courses

Professional Communication & Information Management – 3 credits

Engineering Project Planning & Management – 3 credits

Advanced Math/Engineering Analysis – 3 credits

2. 18 credits of Concentration Courses
3. A 3-credit Capstone Project

Typically, one Concentration Course is offered as distance learning courses every semester from the following:

- ENVE 5530 Geoenvironmental Engineering (Fall)
- ENVE 5210 Environmental Engineering Chemistry (Spring)
- ENVE 5252 Environmental Remediation (Fall)

More courses may be offered in future academic years.

4.4 Ph.D. Program Requirements

Expectations of Ph.D. Graduate Study:

Graduate students should demonstrate the following basic research skills to be successful in their research:

- Independent critical thinking (Literature research, data organization, time management)
- Technical Writing (Clear and concise expression, problem-solution based, citations)
- Connection of different concepts (Thinking in an interdisciplinary manner)
- Technical Presentations (Articulation, visualization)

Steps of Ph.D. Graduate Study:

1. Plan of Study (POS)
2. General Exam (GE)
3. Proposal Defense (PD)

4. Publications (PUB)
5. Dissertation Defense (DD)

Each student must complete a Department PhD Checklist form that must be approved by their Advisor and the ENVE Program Director before scheduling the final defense (i.e. step 5). The checklist form is to ensure that all students in the program are following these steps and timelines. Without an approved PhD Checklist Form, students will not be able to proceed with scheduling their Dissertation Defense.

Coursework and Plan of Study

The requirements of the Graduate School for the Ph.D. degree may be found under <https://gradcatalog.uconn.edu/grad-school-info/academic-regulations/>.

If a student is admitted to the Ph.D. program with only a B.S. degree, at least 30 credits of coursework are required. If the student has a M.S. degree, the minimum requirement is 15 credits. However, if the M.S. degree is in a field other than Environmental Engineering, the ENVE Graduate Admissions committee will determine the minimum number of credits required for coursework. All Ph.D. students are required to take or demonstrate proficiency in the following courses prior to taking the General Exam:

- ENVE 5310 Environmental Transport Phenomena
- ENVE 5320 Quantitative Methods for Engineers
- ENVE 5210 Environmental Engineering Chemistry
- ENVE 5810 Hydrometeorology
- ENVE 5821 Vadose Zone Hydrology **OR** 5540 Design of Groundwater Systems

The advisory committee may substitute the above with equivalent courses. The remaining credits may be taken in one of the three areas of concentration described previously. No more than 6 credits of 3000 or 4000 level courses may be used towards the degree. When the student has completed 18 credits of course work a Plan of Study has to be filed with the Graduate School.

General Examination

The Qualifying Examination is taken after the student has completed at least 12 credits of coursework (with a M.S.) or 18 credits of coursework (with a B.S.) and is considered the first part of the General Examination. The program administers the examination twice a year, in January and in May. An approved Plan of Study must be filed with the Graduate School before the Qualifying Examination can be taken. The Environmental Engineering Program administers the Qualifying Examination as both a written and an oral examination to test student mastery of core environmental engineering concepts and student ability to integrate concepts across disciplinary areas.

Part two of the General Examination is taken at most one year after the Qualifying examination. The student will prepare a dissertation proposal that outlines the proposed research for the dissertation. The student will defend their proposal in an oral examination to a minimum of five faculty, including all members of their advisory committee.

The purpose of the oral examination is to test student mastery of core environmental engineering concepts and student ability to integrate concepts across disciplinary areas.

Qualifying Examination (Part 1 of the General Exam)

We expect PhD candidates to critically review the literature and then develop their own research plan to address a novel question and move that area of work forward. In order to do that, you should be able to:

1. Understand the literature that places the work in context and identify gaps in knowledge.
2. Clearly state research objectives and hypotheses.
3. Develop an experimental plan to test those hypotheses on the basis of your theoretical understanding.
4. Consider multiple lines of evidence and approaches to interpret the results of your experimental plan.
5. Place the work in a broader context.

The qualifying examination is meant to test whether you are prepared to address the critical review of the literature on the basis of your understanding of environmental engineering fundamentals related to your lines of research.

Students will be provided a research article relevant to their research specialization area, selected by the faculty in conjunction with the student's main advisor. They will have one week to prepare a presentation to explain the context, purpose, approach, and results of the research, showcasing their understanding of environmental engineering fundamentals as well as research skills. Students will present this research to an examining committee consisting of three voting faculty members, as well as their primary advisor. The primary advisor will not vote on the outcome of the exam and will leave the room prior to the vote. Students should be prepared to:

1. Clearly present the technical work to a broad audience of faculty.
2. Answer questions related to the fundamental environmental engineering concepts that frame the context and approach to the research.
3. Justify that the experimental design is appropriate to meet the stated objectives and discuss any trade-offs.
4. Answer questions about interpretation of the results, whether empirical or modeled, based on fundamental environmental engineering concepts.
5. Critique the research and consider alternative approaches or areas to improve.

Students should prepare their presentation in powerpoint and may use the white board or electronic device during the examination to answer questions. Students are allowed to bring up to 5 pages of notes with them to the examination.

Students will be assessed on the clarity of their presentation, their understanding of relevant environmental engineering fundamentals, and their understanding of the research approach and

results. The committee will decide whether the student (1) has passed the examination, (2) should re-take the examination, or (3) failed without the possibility to re-take. Outcome (3) requires a unanimous vote.

A student can take the qualifying exam twice, if the examination committee allows for a re-take. In the re-take, the committee will decide whether the student has passed or failed the examination by majority vote. If a student fails the qualifying exam both times, they are deemed unqualified to pursue a Ph.D. and are dismissed from the program. Students dismissed may acquire an M.S. degree upon fulfillment of the appropriate requirements.

Preparation for the Qualifying Examination:

In preparation for this examination and your future dissertation proposal, you should be reading the literature with a critical eye. You should be aware of the tradeoffs and uncertainty with the research approaches used. You should be able to interpret the results in a paper even without the author's written results and discussion sections. You should be able to critique the methodology and interpretation of the data.

To prepare for this exam, it is a good idea to read critically a variety of research papers to ensure you can understand, interpret and critique the work using your knowledge of fundamental environmental engineering concepts as well as research skills. You can consider the following in your assessments:

Do you understand how the literature adequately places the work in context, identifies a knowledge gap, and leads to the stated objectives and hypothesis? You may need to review fundamental course content or read a few key cited papers to aid in your understanding.

Is the experimental approach appropriate to meet the stated objectives and/or hypothesis? Are the methods chosen appropriate? Do you understand the theoretical underpinnings based on fundamental environmental engineering concepts? What are the tradeoffs? How is uncertainty handled?

Can you interpret the figures and tables on your own, without the author's interpretation? Are there other lines of evidence that would be useful? Can you explain in your own words the evidence the authors use from their own work and other cited work, to support the stated conclusions?

What questions are addressed and/or emerge from this research?

As you read the research literature in your coursework or with your advisor for ongoing research, these are areas that you will become proficient in over time.

Dissertation Proposal (Part 2 of the General Exam)

The dissertation proposal is a document that outlines the proposed research for the dissertation and has to be compiled and approved before the research is well underway. It is recommended that the dissertation proposal is submitted for approval within one year after a student passes the Qualifying Exam. The proposal consists of the submission of a written document to the advisory committee and an oral presentation to the committee. The written proposal and the appropriate form must be submitted to the Graduate School for approval. The Dissertation

Proposal form is signed by the advisory committee and the ENVE Program Director. Instructions for the preparation of the proposal are provided in the form.

In general, the dissertation proposal addresses the following questions:

- What is the hypothesis/scientific question that drives the proposed research?
- Why is the problem significant?
- How will the research address the research hypothesis?

A suggested outline for a Dissertation Proposal includes:

1. Introduction (~1 page): general introduction of the problem statement and the proposed scope of the research
2. Background (3-5 pages): literature review of specific scientific problem and potentially presentation of general scientific principles and tools required to address it (e.g. overview of statistical tools or analytical methods central to the research)
3. Materials and Methods (3-5 pages): description of materials (if pertinent), data collection methods, and experimental, analytical or numerical methods that will be employed in the research. Addressing the rationale behind the methodology and addressing potential weaknesses and pitfalls is essential in this part.
4. Expected Results (1-2 pages): the synthesis of individual methods and approaches towards addressing the central question or hypothesis should be addressed here.
5. Work plan/Timetable
6. References

Checklist for Dissertation Proposal

- ✓ Prepare document
- ✓ Schedule presentation
- ✓ Obtain signatures from advisory committee and ENVE Program Director on Dissertation Proposal Form
- ✓ Submit Form and Proposal document to the Graduate School

Dissertation Research and Thesis Requirements

A doctoral student, in conjunction with his/her major advisor, forms an advisory committee consisting of the major advisor and at least two (but in most cases four) associate advisors with suitable academic or scientific credentials. This committee oversees and mentors the student throughout the duration of the student's degree track. Members of the committee must be active participants in each milestone event and their original signatures of approval are required on all Graduate School necessary documents.

The topic of the dissertation research is agreed upon by the major advisor and the Ph.D. student. If the student is funded by a Research Assistantship, the topic of the research project and the dissertation may, but not necessarily, overlap. The research should be original and eventually published in peer-review journals. As a requirement for graduation, a Ph.D. student must have three journal papers: one published or accepted for publication, one under review and one in the final stages of preparation. However, it is important that the three papers address a larger, coherent research question (as outlined in the Dissertation Proposal below) and they are not isolated bodies of work.

Candidacy, Dissertation Preparation, and Final Oral Defense

There are three typical requirements for a student to become a formal candidate for the Ph.D. degree:

- Approval of Plan of Study
- Passing the General Exam
- Approval of Dissertation Proposal by Graduate Faculty Council

Information on the dissertation preparation and scheduling of the oral defense is provided at <https://registrar.uconn.edu/doctoral-degree-programs/dissertation-information/>

Dissertation Preparation

The dissertation may conform to one of two general formats:

- A. Traditional outline, with chapters that may include
 1. Introduction
 2. Literature Review
 3. Materials and Methods
 4. Results and Discussion
 5. Conclusions and Recommendations
 6. References
- B. Compilation of journal paper manuscripts

In this case, each journal paper is a separate chapter, with its contents presented as sub-chapters. An introductory chapter and a conclusions chapter should be prepared in addition to the manuscripts. These will explain the common thread between the papers, in terms of rationale and methodology (introductory chapter) and big-picture conclusions and recommendations (conclusion chapter).

The graduation requirement of the ENVE program to produce three journal papers (one accepted/published, one in review and one in final preparation) renders option B more

attractive. However, the format of the dissertation results from the agreement between the major advisor and the Ph.D. candidate.

An electronic and one printed copy of the dissertation have to be submitted to the Graduate School

Formatting guidelines are provided in <https://registrar.uconn.edu/doctoral-degree-programs/dissertation-information/>

Oral Defense

Before you can schedule the oral defense, you have to obtain tentative dissertation approval from all members of the advisory committee and a signed PhD checklist from the ENVE Program Director. It is advised that you circulate the working draft of the dissertation at least one month prior to the desired defense date, as at least two weeks are required to announce the defense and another two weeks should be extended to the committee for review.

The oral defense of the dissertation must be announced publicly by means of the University's online Events Calendar at least two (2) weeks prior to the date of the defense. For announcements, contact the ENVE program administrator. You should book CAST 306 well in advance to insure availability. Provide the title, date and time, advisory committee member list and abstract for the defense. For the UConn Events Calendar, directions are provided in the Dissertation Information link provided above.

At this time, electronic tentative approval of the dissertation and an electronic working copy of the entire dissertation must be filed with The Graduate School.

Not fewer than five (5) members of the faculty, including all members of the candidate's advisory committee, must participate in the final examination.

The oral defense entails three sections:

- Oral presentation of the dissertation contents (~45 min)
- Questions from the general public attending (~15 min)
- Questions from the advisory committee in closed session (30-60 min).

Following the last section, the candidate is excused and the committee convenes to decide on the outcome of the defense. The decision to pass the oral defense must be unanimous. The successful candidate should have ready the following documents to obtain signatures from all committee members:

- Two copies of the cover page of the dissertation, printed on white 25% cotton 20 or 24 lb paper.
- Two copies of the Report on the final Examination. One copy will be submitted to the Graduate School and one will be retained by your major advisor.

Checklist for dissertation and defense

- ✓ Circulate draft dissertation and obtain tentative approval form
- ✓ Schedule defense and announce in University Calendar
- ✓ Print cover page and Report form and bring to the defense
- ✓ Submit final dissertation electronically and bring one hard copy to the library

4.5 Graduation Information

Conferral

Degree conferral requires that the student be in good academic standing and that all requirements for the degree have been completed satisfactorily by the deadline specified in The Graduate School's Academic Calendar. Degrees are conferred three (3) times each year in August, December, and May. However, the only graduate Commencement ceremony is held annually in May. Students who qualify for degree conferral receive their diplomas by mail, normally within three (3) months following conferral.

Application for the Degree

Formal application for a degree to be conferred must be filed online by the degree candidate using the Student Administration System. Information and instructions can be found on <https://registrar.uconn.edu/graduation/graduate-programs/> . If filing is not timely, conferral is delayed to the next conferral period, even though all other degree requirements may have been completed on time.

Commencement

The graduate Commencement ceremony is held once each year at the end of the spring semester. Individuals who have had degrees conferred at the end of the previous summer or fall semester, and candidates for degrees who complete degree requirements by the end of the spring semester may participate in the annual Commencement ceremony. Academic regalia appropriate for the University of Connecticut degree being conferred is strictly required for all who participate in the ceremony. Information concerning the Commencement ceremony, including academic regalia and guest tickets, is made available by the mid-spring semester.

Important dates

Students may check the Academic Calendar (<https://registrar.uconn.edu/academic-calendar/>) for actual dates.

5. Laboratory Training and Access Policies

UConn has established Safety Policies, Programs and Procedures to promote safety to the public at the university. This has been developed by UConn's Environmental Health and Safety (EH&S), a Division of Health and Environmental Public Safety. EH&S provides these Policies, Programs and Procedures in response to regulatory requirements and/or University committee decisions. Therefore, these items are MANDATORY in nature, and must be followed by all

departments and individuals to ensure compliance for laboratory safety access at UConn. At the request of CEE faculty, a formal departmental policy has been developed in order to be able to communicate to various entities requesting laboratory access. This document articulates some basic elements for this policy. It may be found on the departmental website:

[CEE Laboratory Access and Key Distribution Policy](#)

In general, access to Environmental Engineering Labs requires:

- Contacting your advisor or course instructor (for TAs) to determine which rooms you need to have access in order to complete your assignments, and the required training for these activities. Print out the relevant access forms from the CEE website and have your advisor sign them.

All activities that involve wet chemistry require at a minimum, the completion of the EH&S Lab Safety and Chemical Waste Management course. You may sign up online at <http://www.ehs.uconn.edu/Chemical/?p=training>

An online refresher is required on an annual basis, once you have completed the training once in person. Failure to renew your training will result in revoking your lab access until the training is complete.

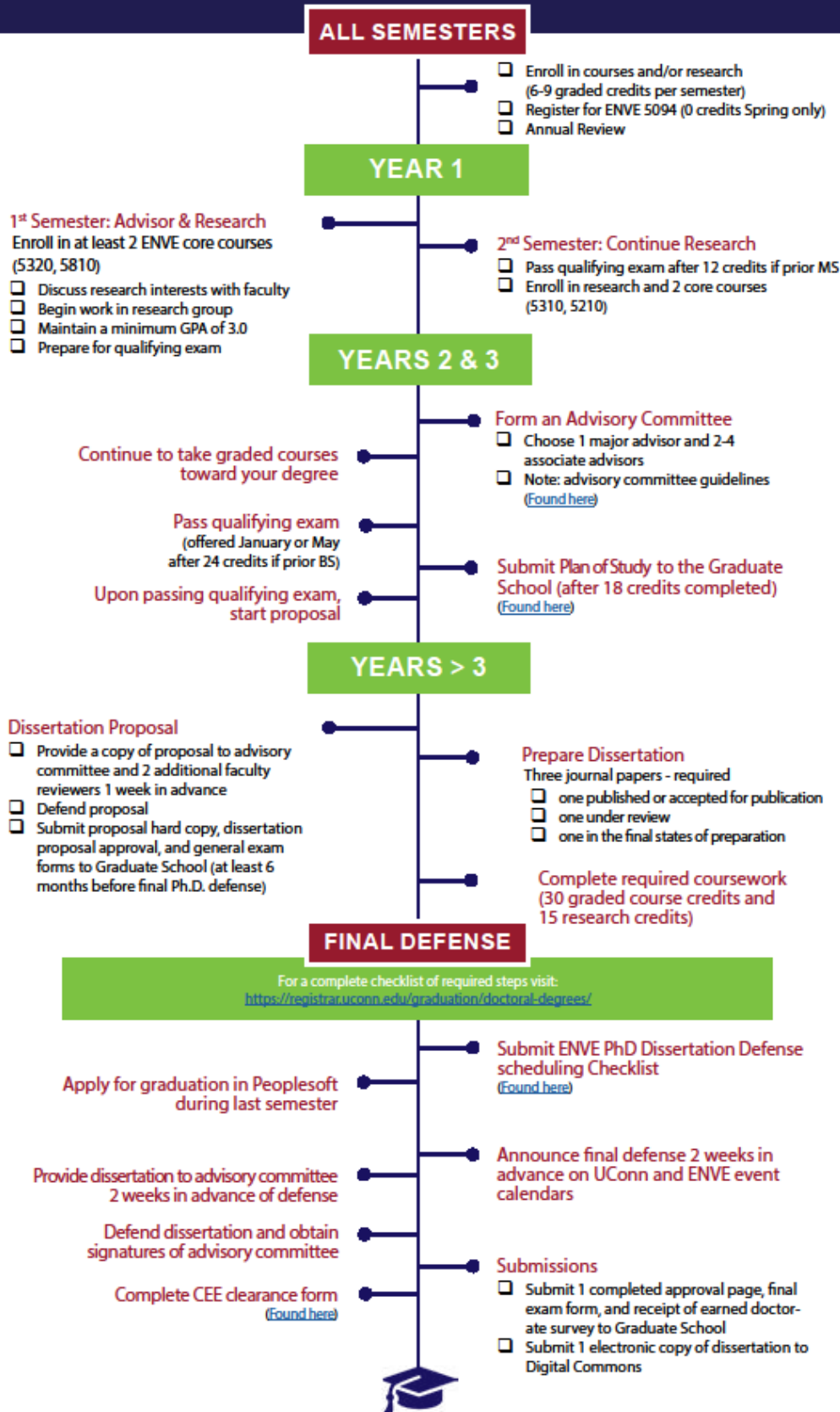
Additional training may be required for Biological Safety, Radiation Safety or use of respirators, depending on the type of lab activity. You may consult with your advisor or the CEE department Lab Supervisor. You can also check the EHS page (<https://ehs.uconn.edu/chemical-health-and-safety/>)

- Completing an ESO form (<http://ehs.uconn.edu/forms/ESO.pdf>) with your advisor/supervisor, IF you are on payroll as a TA or RA.
- Setting up an appointment with your advisor or CEE Lab Supervisor. They will provide a lab tour, a copy of the CEE department lab manual and sign off on the relevant access forms.
- Go to the CEE main office with the completed form and provide the \$25 deposit to obtain the key (\$25 for each key is required). This will be returned to you upon completion of your studies.



Ph.D. Program Checklist

ENVIRONMENTAL ENGINEERING PROGRAM



7. Helpful Links & Contacts

General Exam Reporting: [General Exam Form](#)

Final exam for doctoral degree: [Report on the Final Exam](#)

Office of the Registrar Registration info: [Registration Info](#)

Help Videos on registering for classes: [Help Videos](#)

Student IT Knowledge Base (Tasks related to student accounts): [Help Docs](#)

Link to Student Admin: [Student Admin](#)

Can't enroll in a course: [Enrollment issues](#)

Tips on your Advisor: [Advisor](#)

Contacts for the Grad School: [Grad School Contacts](#)

UConn Graduate Employee Union: [GA Union](#)

Payroll Information: [Payroll](#)

GA seeking supplemental employment: [Supplemental Employment Approval Form](#)

Contacts:

Nadine Boudissa – International Advisor for School of Engineering: Nadine.boudissa@uconn.edu