

UConn

SCHOOL OF ENGINEERING



Environmental Engineering Program

GUIDE TO COURSE SELECTION

Fall 2017

Environmental Engineering Program
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PROGRAM EDUCATIONAL OBJECTIVES

We provide a holistic learning environment that requires students to integrate scientific principles and apply them to natural and engineered systems. Students are challenged with real life problems that rely on field investigation, laboratory testing and synthesis through mathematical modeling. The curriculum maintains a close relationship with practicing professionals and provides students with a strong background in mathematics, physical sciences, and engineering fundamentals.

The Environmental Engineering undergraduate program educational objectives are to impart our alumni/ae with the knowledge and skills needed to:

- contribute actively to the practice and profession of engineering in the public and/or private sectors in the technical area of environmental engineering;
- follow the path that leads towards becoming licensed professional engineers, assessing the impact of human activities on the environment, designing and constructing solutions to minimize and mitigate such impacts, and tending to the natural environment as our life support system;
- practice lifelong learning through post-graduate and professional education.

These objectives are accomplished by:

1. Offering rigorous and highly relevant courses that meet or exceed ABET accreditation requirements to enable fundamental knowledge transfer while engaging students in problem solving projects, interactive activities, and hands-on experiments.
2. Completion of a sequence of Environmental Engineering Design courses that provide the capstone experience and involve participation by Professional Engineers.

PROGRAM GUIDELINES

The program is designed to comply with both the ABET Engineering Criteria for Environmental Engineering and the University of Connecticut guidelines. Students should be able to pass the Fundamentals of Engineering (FE) exam and the Professional Engineer (PE) exam to attain professional licensure.

ABET requires certain criteria of environmental engineering programs that prepare graduates to have proficiency in:

1. Mathematics through differential equations, probability and statistics, calculus-based physics, general chemistry; an earth science, a biological science, and fluid mechanics, relevant to the program of study;
2. Introductory level knowledge of environmental issues associated with air, land, and water systems and associated environmental health impacts;
3. conducting laboratory experiments and critically analyzing and interpreting data in more than one major environmental engineering focus area, *e.g.*, air, water, land, environmental health;
4. Performing engineering design by means of design experiences integrated throughout the professional component of the curriculum;
5. Advanced principles and practice relevant to the program objectives;
6. Understanding of concepts of professional practice and the roles and responsibilities of public institutions and private organizations pertaining to environmental engineering.

ENVE CURRICULUM AY 2017-18

FIRST YEAR - First Semester		Cr.	Second Semester		Cr.
CHEM 1127Q General Chemistry		4	CHEM 1128Q General Chemistry		4
MATH 1131Q Calculus I		4	MATH 1132Q Calculus II		4
ENGR 1000 Orientation to Engineering		1	ENGR 1166 Foundations of Engineering		3
CSE 1010 Intro to Computing for Engineers (F/S)		3	ENVE 1000 Environmental Sustainability (CA2)		3
ENGL 1010 Seminar in Academic Writing or ENGL 1011 Sem. in Writing thru Literature (F/S)		4	(1) CA 1 (_____)		3
TOTAL		16	TOTAL		17

SECOND YEAR - First Semester			Second Semester		
PHYS 1501Q Physics for Engineers I		4	PHYS 1502Q Physics for Engineers II		4
MATH 2110Q Multivariable Calculus		4	MATH 2410Q Elem. Differential Equations		3
CE 2110 Applied Mechanics I (F/S)		3	PHIL 1104 Philosophy & Ethics (CA1)		3
ENVE 2310 Environmental Eng'g Fundamentals		3	CHEG 2111 Chemical Eng'g Thermodynamics or ME 2233 (F/S)		3
CE 2251 Probability and Statistics in CEE (F/S)		3	ENVE 3200 Environmental Engineering Lab		3
TOTAL		17	TOTAL		16

THIRD YEAR - First Semester			Second Semester		
NRE 3155 (even years) or NRE 3205 (odd years) or NRE 3105 (odd years)		3	ENVE 3220 Water Quality Engineering		3
ENVE 3120 Fluid Mechanics (F/S)		4	ENVE 3230 Introduction to Air Pollution		3
ENVE 3270 Environmental Microbiology		3	(1) GenEd: CA 4(I) (_____)		3
ENVE 4210 Environ. Engineering Chemistry		3	(4) Professional Elective		3
NRE 4135 Groundwater Hydrology (2) OR Professional Elective (4)		3	ENVE 3530 Engineering and Environmental Geology (2) OR Professional Elective (4)		3
CE 2211 Engineering Economics (F/S)		1			
TOTAL		17	TOTAL		15

FOURTH YEAR – First Semester			Second Semester		
ENVE 4910W Environmental Eng'g Design I		2	ENVE 4920W Environmental Eng'g Design II		2
ENVE 4320 Ecological Principles & Eng'g		3	ENVE 4310 Environmental Modeling		3
ENVE 4810 Engineering Hydrology (3) or Professional Elective (4)		3	ENVE 4820 Hydraulic Engineering (3) or Professional Elective (4)		3
(1) GenEd: CA 4 (_____)		3	(4) Professional Elective		3
(1) GenEd: CA 2 (_____)		3	Free Elective		3
Free elective		3			
TOTAL		17	TOTAL		14

(1) In addition to the General Education courses PHIL 1104 (CA1) and ENVE 1000, students must take additional 9 or 12 credits of General Education courses. These must fulfill the following requirements: one CA1 course, 1 CA2 course, 2 CA4 courses, with one CA4 being designated as International (I). One double-dipping (i.e. taking a course that fulfills two areas, CA1/CA4 or CA2/CA4) is allowed and the three credits may be substituted with a free elective. Lists of approved GenEds in each area can be found at <http://geoc.uconn.edu>.

(2) Earth Science Requirement (1 Course):

- NRE 4135-Intro. to Groundwater Hydrology (Fall semester) OR
- ENVE 3530- Engr. & Env. Geology (Spring semester) OR
- ENVE 4530 Geoenvironmental Engineering (Spring semester)

(3) Hydrologic Science Requirement (1 Course)

ENVE 4810-Engineering Hydrology (Fall semester) OR ENVE 4820-Hydraulic Engineering (Spring semester)

(4) Professional Electives (4 Courses): At least one course from four different focus areas (see pg. 2 for list of approved courses). ENVE 4886 Thesis I (1 cr) plus ENVE 4986 Thesis II (2 cr) may fulfill one professional elective. Honors students must fulfill one professional elective using ENVE 4886 + 4986. ENVE 4886 + 4986 is recommended as a professional elective for students planning to pursue graduate studies. Courses used to fulfill Natural Resource, Earth Science or Hydrologic Science requirements cannot also count as Professional Electives.

ENVE Professional Electives

<p>Area 1: Data Collection and Analysis NRE 3535 Remote Sensing of the Environment GEOG 2500 Introduction to GIS ME 3263 Introduction to Sensors and Data Analysis CE 2410 Geomatics & Spatial Measurement CE 4410 Computer Aided Site Design</p>	<p>Area 6. Water Resources ENVE 4810. Engineering Hydrology ENVE 4820. Hydraulic Engineering NRE 3125 Watershed Hydrology NRE 4135. Introduction to Groundwater Hydrology NRE 4165. Soil and Water Management and Engineering</p>
<p>Area 2. Renewable Energy ME 3270 Fuel Cells ME 3285 Sustainable Energy Sources and Systems * Courses offered as Special Topics in Renewable Energy also qualify as PR under this area</p>	<p>Area 7. Geoenvironmental Processes CE 3510. Soil Mechanics CE 4530. Geoenvironmental Engineering ENVE 3530. Engineering and Environmental Geology NRE 4165. Soil and Water Management and Engineering.</p>
<p>Area 3. Systems Analysis CHEG 3151. Process Kinetics CHEG 4147. Introduction to Process Dynamics and Control. CE 4210. Operations Research in Civil and Environmental Engineering</p>	<p>Area 8. Atmospheric Processes GEOG 3400. Climate and Weather NRE 3145. Meteorology NRE 3146 Climatology ME 3239. Combustion for Energy Conversion</p>
<p>Area 4. Environmental Chemistry CHEM 2241 or CHEM 2443. Organic Chemistry CHEM 4370. Environmental Chemistry - Atmosphere SOIL 3410. Soil Chemistry Components SOIL 4420. Soil Chemistry Processes MARN 4030W. Chemical Oceanography NRE 3155. Water Quality Management</p>	<p>Area 9. Management and Policy AH 3275. HAZWOPER ARE 3434. Environment and Resource Policy ARE 4462. Economics of Natural Resource Use EEB 3205. Current Issues in Environmental Science GEOG 3320W. Environmental Evaluation and Assessment GEOG 3340. Environmental Planning and Management LAND 3230W. Environmental Planning and Landscape Design MEM 2221. Principles of Engineering Management NRE 3245. Environmental Law</p>
<p>Area 5. Environmental Biology MCB 2610. Fundamentals of Microbiology NRE 3105. Wetlands Biology and Conservation NRE 3205. Stream Ecology</p>	

Note: a few of the Professional Electives have pre-requisites. Students are advised to check the catalog (<http://catalog.uconn.edu/directory-of-courses/>) to determine whether they meet the prerequisites to select a certain course. In addition, the ENVE Program does not guarantee the absence of scheduling conflicts for Professional Electives.

How Do I Register for Classes?

1. **Make an appointment to see your advisor, two weeks or more prior to your registration time window**, which you can see in your Student Center in Student Administration. Not everyone uses AdvApp, email works always.
2. **Meet with your advisor.** Several things will happen in your meeting:
 - a. **You will discuss your schedule**, for the upcoming semester and in general, as well any other career plans you may have (study abroad, grad school etc.)
 - b. **You will review your preliminary Plan of Study (POS), if applicable.**
3. **Your faculty advisor will fill out and sign a registration/bar removal form.**
4. **Take the registration/bar removal form to the ENVE Main Office, located in Castleman, room 307. Your bar will be lifted within the following 24 hours.**
5. **Login to Student Administration** during your enrollment appointment window and sign up for your courses. Be sure to sign up for the courses your advisor directed you to take. If you need to deviate from the schedule you and your advisor discussed, contact your advisor immediately to make sure this will not have repercussions on your course program and planned graduation date.

What are Preliminary and Final Plans of Study and when do I submit them?

A **preliminary POS** is filed after a student has reached junior credit standing (54 credits or more) and outlines the student's coursework plan until graduation. Submitting an approved preliminary plan of study is **required** in the School of Engineering.

A **final POS** is filed after you have registered for your final semester of coursework. The final POS must demonstrate that the student meets all requirements to graduate. The final POS is a UConn graduation requirement.

How do I submit a preliminary POS?

1. Access your Academic Planner in Student Admin: SA Self Service > Student Center > Academic Planner
2. Select "Plan by Requirements" to review your remaining unsatisfied requirements for your degree. You may also add courses to your planner using the "Browse Course Catalog" component.
3. Review what semester your required courses are offered and enter them into your Academic Planner. Then select "Submit Plan of Study" and the document will be sent electronically to your faculty advisor for their review.

If the preliminary POS is **denied**, you must fix whatever errors are indicated and submit a new, correct POS that satisfies all degree requirements. If the POS is **approved**, you now have a complete and accurate plan to reach graduation.

If you decide to deviate from this plan, it is your responsibility to discuss the changes with your academic advisor and ensure that you are still completing all degree requirements. If you need further assistance, please access this video tutorial or contact your Academic Advisor:

<https://www.youtube.com/watch?v=bXChknVu1yM>

How do I submit a final POS?

1. Apply for graduation via Student Admin. *SA Self Service > Student Center > My Academics > Apply for Graduation*
2. Submit your final plan of study. *SA Self Service > Student Center > Academic Requirements (under the drop down menu at the left) > "Submit Final Plan of Study" button*

All of your requirements must show as satisfied in student admin to have your final plan of study approved.

Who Do I Need To See For ... ?

Signatures

If a form asks for the signature of you should see:
... the Dean	the Associate Dean for undergraduate education or the Director of Advising, SoE
... the Department Head	the Program Director of ENVE
... your advisor	your advisor , listed in Student Administration

*So ... Who Are these People?**

Title	Name, Office, Phone, Email
Associate Dean, SoE, Undergraduate Programs	Daniel Burkey, EII 304A, 860-486-2167 daniel.burkey@uconn.edu
Director of Advising, SoE	Whitney Losapio, EII 304, 860-486-5466 whitney.losapio@uconn.edu
Program Director, ENVE	Prof. Maria Chrysochoou, CAST 314, 860-486-3594 mariza@engr.uconn.edu
Professional Advisor, CEE	Althea Lozefski, ITE 460, 860-486-8079 althea.lozefski@uconn.edu
Your faculty advisor	You can find out who your advisor is by looking at your Student Center in Student Administration.

*correct as of May 15, 2017

How Do I Satisfy the General Education Requirements?

ENVE students take two required GenEd courses, in addition to the PHYS and CHEM courses that satisfy CA3:

- PHIL 1104 (CA1)
- ENVE 1000 (CA2)

To satisfy the remaining requirements, you need to take

- One course in CA1
- One course in CA2
- Two courses in CA4, one of which must be designated as International (I)

You can find a complete list of Gen Eds under geoc.uconn.edu or you can search for a specific content area on Student Admin.

You may double-dip once (e.g. choose one course that satisfies two areas, CA1/CA4 or CA2/CA4) but then you have to make sure you make up for the 3 credits by taking an additional Free Elective.

Note that you need to choose two courses from DIFFERENT programs to satisfy each area (e.g. you cannot use two PHIL courses for CA1 or two ANTH courses for CA4).

What about Transfer Courses and Course Substitutions?

How do I get credit for courses I took somewhere else?

Courses from other institutions with a grade of C or better can be transferred and can count as credit towards graduation, subject to the credit restrictions noted below. Not every course will help you meet course requirements in ENVE. If you are planning to take a course elsewhere to meet a graduation requirement, check with your advisor or the Program director to make sure the course will satisfy a graduation requirement before you sign up for and take the course. You should also fill out the **Prior Course Approval Form** via Student Administration.

The following website gives information about how to transfer in credit for courses taken at other colleges and universities: <http://admissions.uconn.edu/content/transfer/transfer-credit>

You can also search for courses offered at colleges and universities in Connecticut that transfer as UConn courses at the following webpage: <http://transfer.uconn.edu/search.php>.

University Course Restrictions (listed in the Undergraduate Catalog):

- No credit for MATH 1010
- Not more than 12 credits of biology (MCB or EEB) at the 1000-level
- Not more than 3 credits of EKIN 1160
- Not more than 6 credits from PHIL 1101 through 1107 (note that PHIL 1104 is required for students in Engineering)
- Not both STAT 1000 and 1100

No credit for a course prerequisite to a second course in the same department may be counted for credit toward graduation after the student has passed the second course.

Additional SoE Restrictions (these may not be used on the POS):

- MATH 1110Q or 1112Q or courses numbered below 1100
- PHYS 1010Q and 1030Q
- CSE 1000
- No course taken on a Pass/Fail basis may be counted for credit toward graduation or used to meet any course requirement of the School of Engineering
- No more than 8 credits of 1000-level PHYS or CHEM

Can I substitute another course for one that is required?

Following is a list of automatic course substitutions that do not require special approval.

Other substitutions may be granted under special circumstances. You may petition the Program Director of ENVE and the Director of Advising for SoE for any other course substitutions before taking the substituted course.

Instead of taking you may substitute
ENGL 1010 or 1011	ENGL 91002 and ENGL 91003 (transferred courses) with approved waiver documentation from English Department
ENGR 1166	The equivalent credits in any 2000-level engineering courses
MATH 1131Q	(MATH 1125Q and 1126Q*) or MATH 1151Q
MATH 1132Q	MATH 1152Q
MATH 2110Q	MATH 2130Q
MATH 2410Q	MATH 2420Q
MATH 1131Q, 1132Q, 2110Q & 2410Q	MATH 2141Q and 2142Q and 2143Q and 2144Q
CHEM 1127Q	CHEM 1124Q and 1125Q*
CHEM 1127Q and CHEM 1128Q	CHEM 1124Q and 1125Q and 1126*
CHEM 1127Q and CHEM 1128Q	(CHEM 1137Q and 1138Q) or (CHEM 1147Q and 1148Q)
PHYS 1501Q and PHYS 1502Q	PHYS 1201Q and 1202Q and (1230 or 1530)*
PHYS 1501Q and PHYS 1502Q	(PHYS 1401Q and 1402Q) or (PHYS 1601Q and 1602Q)
CHEG 2111	ME 2233

*the credits for MATH 1125Q, CHEM 1124Q and 3 credits of the PHYS may not be counted toward graduation.

Can I Get a Minor in Another Subject?

Yes! Review <http://catalog.uconn.edu> for a full list of Minors offered at UConn. Contact the department or office listed in the Catalog for the minor program in which you are interested to find the courses required. Share this information with your Advisor, and together you can select courses to meet the requirements for both your major and the minor. Major and minor requirements can overlap to use one course to fulfill requirements for both.

Some related minors for ENVE students are:

Environmental Economics and Policy <http://catalog.uconn.edu/minors/environmental-economics-policy/> : ARE 3434, ARE 4462 and NRE 3245 are Area 9 courses that may count towards this minor.

Environmental Studies <http://catalog.uconn.edu/minors/environmental-studies/> : EVST 1000 may substitute for ENVE 1000, ARE 3434 or 4462 are Area 9 courses and GEOG 3400 is an Area 8 course. Six elective credits may be from the ENVE core curriculum as agreed upon with the EVST advisor.

Geographic Information Science <http://catalog.uconn.edu/minors/geographic-information-science/> : GEOG 2500 is an Area 1 course.

Geoscience <http://catalog.uconn.edu/minors/geoscience/>: Minor POS in agreement with Center for Integrative Geosciences

Marine Biology <http://catalog.uconn.edu/minors/marine-biology/>: MARN 3016 is an Area 4 course, MARN 4030W is an Area 4 course.

Mathematics <http://catalog.uconn.edu/minors/mathematics/>: 2 additional MATH courses from list A above and beyond the required courses

Oceanography <http://catalog.uconn.edu/minors/oceanography/>: MARN 3016 is an Area 4 course, MARN 4030W is an Area 4 course.

Wildlife Conservation <http://catalog.uconn.edu/minors/wildlife-conservation/>: includes NRE 3205

What if I Want to Do an Internship/COOP or Study Abroad?

Internships and COOPS

Most of our students are able to find employment during the summer break at local engineering firms or government offices. The School of Engineering schedules Career Fairs once each semester at which dozens of companies come to campus looking for students to fill both permanent and temporary positions. Many employers contact faculty directly about job

opportunities as well. These opportunities will also be posted on bulletin boards on the third floor of the Castleman Building and to the student engineering email list. You can learn more about coop and internship opportunities at this link: <http://career.uconn.edu/internships-and-coops/>

UConn's Center for Career Development (CCD), located in the Wilbur Cross building, is a great place to get started. They provide help with resumes, interview skills, and internship & job-searching. There is a Career Consultant that works exclusively with Engineering students. You can schedule an appointment online at www.advapp.uconn.edu. You can find the Engineering Career Consultant under ENGR (Undergraduate Programs Office). Please find additional contact information below.

Title	Name, Phone, Email
Career Consultant, School of Engineering	John Bau, 860-486-3013, john.bau@uconn.edu

Study Abroad

UConn participates in a number of study abroad programs. The EuroTech Program is one that is administered by the School of Engineering and the German Language and Culture Program. You can learn more about EuroTech at this link: <http://eurotech.engr.uconn.edu>

You can learn more about the Study Abroad programs available to UConn students at this link: <http://abroad.uconn.edu/>

Note that when taking a semester away from UConn, if you want to still graduate in four years it is critical to discuss your plans with your advisor as soon as possible to make sure you can meet all course requirements. Studying abroad takes research and careful planning, but it is a truly unique and enriching experience!

FAQs

What courses are offered both semesters?

CE 2110

CE 2251

CE 2211

ENVE 2310 (however, ENVE students are advised to take it in the Fall semester so they may take ENVE 3200 in the Spring)

ENVE 3120

What If I decide I want to take a different course after seeing my advisor?

Contact your advisor before signing up for a different course schedule than what you agreed upon in your advising session. Making a change in your schedule without talking to your advisor could result in missing a critical graduation requirement and postponing your graduation by a semester or even a year.

How many credits may I take per semester?

Engineering students may take up to 19 credits in one semester. To enroll in 20 or more credits you must get an overload approval form from the Registrar's website signed by your advisor and the Associate Dean in the Undergraduate Programs Office. This form must be returned to the Registrar.

What are the new SOE requirements for Probation and Dismissal?

To be in good academic standing in the School of Engineering, students must maintain a 2.5 cumulative GPA after completing 24 or more credits. Students must maintain a minimum 2.3 cumulative GPA to continue in the School of Engineering. Students who fall below a 2.3 cumulative GPA after 24 credits in residence will be re-moved from the School of Engineering and moved to the Academic Center for Exploratory Students. Residence means courses completed at one of the UConn campuses and does not include Early College Experience or non-degree courses. Students will have the opportunity to appeal this decision. If a student's cumulative GPA falls between 2.3 and 2.5, they will be considered on academic probation for the School of Engineering. Students on academic probation will be reduced to a 14-credit load until the cumulative GPA improves to at least 2.5. Students may stay in the School of Engineering while on academic probation with the reduced credit load.

May I take graduate courses as an undergraduate student?

Yes! You will need to get a permission number from the instructor teaching the course. He/she will ask if you have the necessary preparation or pre-requisites that would be expected of graduate students taking the course. Most CE seniors have the preparation necessary to take entry-level graduate courses in the Department. In general, if you have a GPA of at least 3.0, and have the necessary preparation courses, you should be able to successfully complete a graduate course as an undergraduate. There are two ways you might apply a graduate course to your academic record:

1. As a regular course on your CE undergraduate POS. You may use it either as a Professional Requirement course or as a free elective.
2. If you don't need it for your undergraduate POS, then you can take it as an extra course and save it to use for a graduate degree at UConn or another institution.