RENSSSELAER POLYTECHNIC INSTITUTE
School of Engineering

Civil and Environmental Engineering

ENVIRONMENTAL ENGINEERING PROGRAM
# ENVIRONMENTAL ENGINEERING PROGRAM

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Contact Information and General Links and Objectives</td>
<td>4</td>
</tr>
<tr>
<td>Advisor/Student Responsibilities</td>
<td>4</td>
</tr>
<tr>
<td>Bachelor Degree Requirements</td>
<td>6</td>
</tr>
<tr>
<td>Required Courses</td>
<td>7</td>
</tr>
<tr>
<td>Curriculum Checklist</td>
<td>11</td>
</tr>
<tr>
<td>Helpful Hints</td>
<td>12</td>
</tr>
<tr>
<td>Registration</td>
<td>13</td>
</tr>
<tr>
<td>Student Societies</td>
<td>14</td>
</tr>
<tr>
<td>Undergraduate Research Program</td>
<td>15</td>
</tr>
<tr>
<td>International Programs</td>
<td>16</td>
</tr>
<tr>
<td>Cooperative Education</td>
<td>17</td>
</tr>
<tr>
<td>Co-Terminal Degree</td>
<td>17</td>
</tr>
<tr>
<td>Graduate Program</td>
<td>20</td>
</tr>
<tr>
<td>Frequently Asked Questions</td>
<td>21</td>
</tr>
</tbody>
</table>
The Environmental Engineering program brings together dedicated people to study and work on the pressing environmental issues of our time. We prepare students for environmental careers in consulting engineering practice, private industry, national and international research laboratories, government agencies and academia, as well as in many cross-disciplinary areas of engineering, science and public policy. The department maintains close ties with people and organizations in all these career venues through an active research agenda and a vibrant alumni community. Student needs and career objectives are met through a well-crafted, rigorous, and interdisciplinary curriculum that stresses hands-on learning, grounding in fundamentals, and practical experience.

Our long-standing tradition of education in environmental problem solving at Rensselaer spans from the pioneering work on water analysis by William Pitt Mason in the later 1800’s to the visionary environmental engineering ideas of Edward J. Kicawley who introduced environmental engineering as an option in the mid-1940’s and as a degree program in the mid-1950’s. In addition to the Department of Civil and Environmental Engineering, there are faculty members with teaching and research interests in environmental problem solving in the Departments of Biology, Chemical Engineering, Chemistry, Earth and Environmental Sciences and Applied Math.
Contact List for the CEE Department

Department Head: Tarek Abdoun, Ph.D. (Interim) abdout@rpi.edu JEC 4002

Associate Head for Academic Affairs: Michael O’Rourke, Ph.D. orourm@rpi.edu JEC 4046

Administrative Staff:
Graduate Admissions: Kim Boyce boycek@rpi.edu JEC 4049
Dept Coordinator (for URP) Tasha McDonough mcdont3@rpi.edu JEC 4049

General Links:

Advising and Learning Assistance Center: http://alac.rpi.edu/setup.do
Career Development Center: http://www.rpi.edu/dept/cdc/
Co-Op / Internships: http://www.rpi.edu/dept/cdc/students/experience/coop/index.html
Course Catalog: http://www.rpi.edu/academics/catalog/
International Programs: http://undergrad.rpi.edu/update.do?catcenterkey=81
Registrar Forms: http://srfs.rpi.edu/update.do?catcenterkey=29
Student Information System: http://sis.rpi.edu/

Educational Objectives

While certain objectives of an undergraduate education in engineering are common to all programs, there are subtle but important differences depending upon the student’s chosen field. In this regard, the Civil and Environmental Engineering Department’s baccalaureate program in Environmental Engineering will:

1. Prepare students to be involved global citizens with a broad appreciation of the key environmental issues and challenges of the 21st Century.
2. Provide students with a broad educational base, including a foundation in math, science, and engineering and exposure to the humanities and social sciences that will prepare them for life-long learning.
3. Provide students with the technical background needed for the practice of environmental engineering and to insure their competence and literacy in both problem identification and solving, including design.
4. Prepare students for professional engineering practice, including professional licensing, with awareness of the importance of personal and professional ethics.
5. Prepare students to thrive in the modern workplace and the public forums of environmental engineering practice through the development of leadership, teamwork, and communication skills.

The Rensselaer bachelor’s program in environmental engineering builds upon a broad base of studies in chemistry, life sciences, and engineering sciences culminating in a uniquely structured course sequence. This sequence of courses, as shown below, is designed around the unit operations and transport processes concepts, together with integrated laboratory theory courses. It culminates in senior design courses. This structure presents a unified educational experience in environmental engineering. A minimum of 128 credit hours is required for this curriculum.
Responsibilities

Student's responsibilities

• To know their advisor's office hours and advising schedule.
• To make an appointment and prepare for registration advising by reviewing the Catalog, Class-Hour Schedule, and the students Curriculum Advising & Program Planning (CAPP) report.
• To formulate questions regarding curriculum, course selections, career options, etc.
• To be aware of their academic and personal needs and to seek assistance when needed.
• To understand that the role of their advisor is to advise, not to make decisions. Each student needs to realize that it's his or her education at stake, and that, with advisement, they are ultimately responsible for making any final decisions.

Advisor’s responsibilities

• To be accessible to students throughout the year at posted office hours. If an advisor will be away from campus for an extended period of time, he or she should post the names and office locations of alternate advisors outside their offices, so that students will have other advising resources.
• To set aside designated times for registration advising and individual discussions.
• To be knowledgeable about current curriculum requirements, academic policies and procedures, referrals and resources on campus, and career opportunities in the major field.
• To guide students through academic programs that will complement their personal, educational, and professional interests.
Bachelor’s Degree

The requirements of the BSEE program are outlined as follows:

- The BSEE degree requires a minimum of 128 credit hours.
- The minimum grade point average (GPA) is 1.80.
- The course content in humanities and social sciences must total a minimum of 24 credit hours, including at least eight credit hours in the humanities and eight credit hours in the social sciences. For engineering students, four of these credits are satisfied with Professional Development courses (PDI, II and III). For more information on additional requirements see the School of Humanities, Arts, and Social Sciences section of the course catalog.
- Every Civil or Environmental student is required to take at least two communication-intensive courses. One of these courses must be communication intensive and taught in the School of Humanities, Arts, and Social Sciences A list of H&SS/CI courses is available on the Student Information System (SIS) homepage. The other must be either CIVL 4910 (for Civil students) or ENVE 4180 (for Environmental students).
- The student must be registered full-time for a minimum of four semesters. Two semesters of part-time study at Rensselaer will be considered equivalent to one semester of full-time study. In addition, the student must complete a minimum of 48 credit hours at Rensselaer, all of which will be applied to the baccalaureate degree. If a transfer student elects to study abroad or enroll in the co-op program, no more than 12 such credits may apply to the 48 needed for the bachelor’s degree.

A degree candidate must earn the last 30 credits in courses completed on this campus or through a program formally recognized by the Institute. Transfer courses are limited to two courses or eight credits counting toward the student’s last 30 credits and require approval of the director of the Advising and Learning Assistance Center.

Dual Majors

Undergraduate students who fulfill all the degree requirements for two curricula and who have met the conditions below will have completed a dual major. They will receive one diploma noting both majors. (1) The student must designate a first-named and second-named major in writing at least one semester prior to graduation, and have the appropriate department(s) approve this designation prior to filing the dual major form with the registrar. (2) Each student will be assigned an adviser in each department who will monitor progress towards degrees in that department. (3) The degree clearance officer in the department will certify that the student has met the degree requirements in that department. (4) The 24-credit-hour mathematics/science requirement and the 24-credit-hour humanities and social sciences requirement will satisfy the Institute requirements for both majors.
REQUIRED NAMED COURSES FOR B.S. IN ENVIRONMENTAL ENGINEERING

FIRST YEAR FALL:
CHEM-1100 - Chemistry I
Principles of chemistry, with particular focus on atomic and molecular structure and bonding, periodicity, basic thermodynamic principles, introduction to acid-base chemistry and elementary chemical equilibrium, and introduction to organic chemistry. Students cannot get credit for both this course and CHEM-1110.
Fall term annually. 4 credit hours

ENGR-1100 - Introduction to Engineering Analysis
An integrated development of linear algebra and statics emphasizing engineering applications and also incorporating computer exercises involving matrix techniques and calculations using available software packages.
Fall, spring, and summer terms annually. 4 credit hours

ENGR-1200 - Engineering Graphics and CAD
An introduction to the techniques for creating solid models of engineering designs. Topics include three-dimensional modeling of parts and assemblies, visualization, orthographic and isometric free-hand sketching, and computer-generated design documentation.
Fall, spring, and summer terms annually. 3 contact hours, 1 credit hour

MATH 1010 - Calculus I
Functions, limits, continuity, derivatives, implicit differentiation, related rates, maxima and minima, elementary transcendental functions, introduction to definite integral with applications to area and volumes of revolution.
Fall and spring terms annually. 4 Credit Hours

FIRST YEAR SPRING:
ENGR-1300 - Engineering Processes
The use of basic machine tools such as lathes, milling machines, drill presses, band saws, and grinders, including micrometers, vernier calipers, and other devices of use in a machine shop or laboratory. Welding techniques and tool making are also considered.
Fall, spring, and summer terms annually. 1 credit hour

MATH-1020 - Calculus II
Techniques and applications of integration, polar coordinates, parametric equations, infinite sequences and series, vector functions and curves in space, functions of several variables, and partial derivatives. Prerequisite: MATH 1010.
Fall and spring terms annually. 4 credit hours

PHYS-1100 - Physics I
The first semester of a two-semester sequence of interactive courses. Topics include linear and angular kinematics and dynamics, work and energy, momentum and collisions, forces and fields, gravitation, oscillatory motion, waves, sound and interference. Corequisite: MATH 1010 or equivalent or permission of instructor.
Fall and spring terms annually. 4 credit hours
SECOND YEAR FALL:

ENGR-2250 - Thermal and Fluids Engineering I
Application of control volume balances of mass, momentum, energy and entropy in systems of practical importance to all engineers. Identification of control volumes, properties of pure materials, mass and energy conservation for closed and open systems, second law of thermodynamics, Bernoulli equation, fluid statics, forces and heat transfer in external and internal flows, conduction and radiative heat transfer. Prerequisites: ENGR 1100 and PHYS 1100. Corequisite: MATH 2400.
Fall, spring, and summer terms annually. 4 credit hours

ENVE-2110 - Introduction to Environmental Engineering
The application of basic principles and equations dealing with water, air, and solid and hazardous wastes; material and energy balances; and chemical and biochemical cycles. Topics include water resources, water quality and pollution, air quality and pollution, solid and hazardous wastes, and environmental legislation. Corequisite: MATH 2400.
Fall term annually. 4 Credit Hours

MATH-2400 - Introduction to Differential Equations
First-order differential equations, second-order linear equations, eigenvalues and eigenvectors of matrices, systems of first-order equations, stability and qualitative properties of nonlinear autonomous systems in the plane, Fourier series, separation of variables for partial differential equations. Prerequisites: MATH 1020 and some knowledge of matrices.
Fall and spring terms annually. 4 credit hours

PHYS-1200 - Physics II
The second semester of the two-semester sequence of interactive courses. Topics include electric and magnetic forces and fields, Gauss’s Law, dc and ac circuits, Ampere’s Law and Faraday’s Law, electromagnetic radiation, physical optics, and quantum physics. Prerequisite: PHYS 1100 or equivalent or permission of instructor. Corequisite: MATH 1020. Fall and spring terms annually. 4 credit hours

SECOND YEAR SPRING:

CSCI-1190 - Beginning C Programming for Engineers
This course will teach elementary programming concepts using the C language for engineering students with little or no prior programming experience. Students cannot get credit for this course and any other Computer Science course. Fall and spring terms annually. 1 credit hour

ENGR-2050 - Introduction to Engineering Design
A first course in engineering design which emphasizes creativity, teamwork, communication, and work across engineering disciplines. Students are introduced to the design process through a semester-long project which provides a design-build-test experience. Oral and written communication are important elements of the course. The course meets with ENGR 1010. Prerequisites: ENGR 1100 and ENGR 1200. Corequisite: PHYS 1200.
Fall, spring, and summer terms annually. 6 contact hours, 4 credit hours

ENGR-2600 - Modeling and Analysis of Uncertainty
Appreciation and understanding of uncertainties and the conditions under which they occur, within the context of the engineering problem-solving pedagogy of measurements, models, validation, and analysis. Problems and concerns in obtaining measurements; tabular and graphical organization of data to minimize misinformation and maximize information; and development and evaluation of models. Concepts will be supported with computer demonstration. Applications to problems in engineering are emphasized. Prerequisite: MATH 1010.
Fall and spring terms annually. 3 Credit Hours
THIRD YEAR FALL

CHEM-2250 - Organic Chemistry I
Structure and chemical behavior of organic molecules with particular emphasis on reaction mechanisms as pathways for understanding their reactions. Stereochemistry, synthesis, and spectroscopic methods for the identification of organic functional groups are among the topics included. Prerequisite: CHEM 1100 or 1110 or equivalent. Fall term annually. 3 Credit Hours

ENVE-4330 - Introduction to Air Quality
Quantitative introduction to the engineering methods for the study of air quality. Topics include: estimation procedures for air pollution emissions; indoor air quality problems, impacts and control strategies; sources, impacts and control strategies for greenhouse gases; dispersion modeling for point sources; pollutant acidification of lakes; urban source apportionment modeling; chemistry of stoichiometric and non-stoichiometric combustion; regulations for mobile and stationary pollution sources; control devices for motor vehicle and stationary source emissions; assessment methods for human exposure to air pollutants. Prerequisites: CHEM 1100, and CHME 4010 or ENGR 2250. Fall term annually. 3 Credit Hours

THIRD YEAR SPRING:

ENVE-4310 - Applied Hydrology and Hydraulics
Physical processes governing occurrence and distribution of precipitation, infiltration, evaporation, and surface water runoff. Statistical hydrology, unit hydrograph theory, and watershed modeling. Floodplain hydrology and open channel hydraulics. Urban hydrology, hydraulics and design of storm sewers, and design of detention structures for flood control. Design project using the Army Corps of Engineers Hydraulic Engineering Center HEC-1 flood hydrograph package. Prerequisite: ENGR 2250 or CHME 4010. Spring term annually. 4 Credit Hours

ENVE-4320 - Environmental Chemodynamics
The movement of chemicals in air, water, and soil is presented to demonstrate the relation of physiochemical principles in the behavior of chemicals in the environment. Topics include chemical and thermal equilibrium at environmental interfaces, transport fundamentals, and the fate and transport of chemicals in various environmental compartments. Prerequisites: ENVE 2110 or CHME 2010. Corequisite: ENGR 2250 or CHME 4010. Spring term annually. 3 Credit Hours

ENVE-4340 - Physicochemical Processes in Environmental Engineering
Physical and chemical processes governing water quality in natural and engineered systems with applications to potable water treatment. Topics include reactor dynamics, coagulation and flocculation, sedimentation, filtration, gas transfer, adsorption and ion exchange, and membrane processes. A design project for which students develop a computer model of an environmental process is required. Prerequisite: ENGR 2250 or CHME 4010. Spring term annually. 3 Credit Hours

FOURTH YEAR FALL:

ENGR-4010 - Professional Development III
Students will study issues associated with working in teams in a modern work environment. Various styles of leadership, the definitions of power and empowerment and their applications in industry and team settings will be studied. Additionally, other topics to be explored include vision, values and attitudes, and organizational culture. The course format will include small and large group discussions, case studies, experiential exercises, and regular participation from industry guests.
Offered in conjunction with senior courses. 1 Credit Hour

**ENVE-4150 - Environmental Engineering Laboratory**
A laboratory course on experimental analysis of natural and engineered environmental processes. Emphasis is placed on planning of experiments, data evaluation, and report writing. Prerequisite: ENVE 2110 or permission of instructor.
Fall term annually. 4 Credit Hours

**ENVE-4350 - Biological Processes in Environmental Engineering**
The study of biochemical and biological processes common to environmental engineering. Introductory physiology, biochemistry and ecology of bacteria, yeasts, fungi. Laboratory work in microbial techniques. Development of reaction rate and mass balances on biological reactors for pollution control. Topics covered include biogeochemical cycling, thermodynamics of biodegradative processes, activated sludge, trickling filters, stabilization ponds, sludge treatment and digestion, bioremediation, hazardous waste treatment, biological metal cycling and biological solid waste treatment processes. Prerequisite: ENVE 4320.
Fall term annually. 4 Credit Hours:

**FOURTH YEAR SPRING:**

**ENVE-4180 - Environmental Process Design**
The design of equipment, processes, and systems of interest in environmental engineering through application of scientific, technological and economic principles. Emphasis is placed on problem formulation and conceptual, analytical and decision aspects of open-ended design situations. Students will integrate knowledge and skills gained in previous and concurrent courses, and learn research techniques to find and use resources from the technical literature. Health and safety issues are presented. Professional development topics are presented including professional ethics and registration. This is a writing intensive course. Students will develop communication skills through proposal preparation, report writing, oral presentation. Prerequisite: ENVE 2110 and senior standing.
Spring term annually. 3 Credit Hour

**ERTH-4180 - Environmental Geology**
A consideration of technical and scientific aspects of key geo-societal issues. Case studies and analysis of current and historic data bases will be used to illustrate topics including, but not limited to, climate modification, energy resources, future energy, water resources, water pollution, and health risks posed by lead, mercury, and emerging pollutants.
Spring term annually. 4 Credit Hours

A minimum of 128 credit hours is required for this curriculum. Non-engineering courses grades satisfactory/unsatisfactory cannot be applied toward this 128-credit hour requirement. The Pass/No Credit option can be used only for humanities and social sciences electives (up to 6 credits) and free electives having a department code other than CIVL or ENVE. (No more than 12 credits total can be taken Pass/No Credit). All other courses used to satisfy the degree requirements must be taken on a graded basis.
## Environmental Engineering Curriculum Checklist

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Year 1</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM-1100</td>
<td>Chemistry I</td>
<td>4</td>
<td>ENGR-1300</td>
<td>Engineering Processes(^1)</td>
<td>1</td>
</tr>
<tr>
<td>MATH-1010</td>
<td>Calculus I</td>
<td>4</td>
<td>MATH-1020</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>ENGR-1100</td>
<td>Intro. to Eng. Analysis</td>
<td>4</td>
<td>PHYS-1100</td>
<td>Physics I</td>
<td>4</td>
</tr>
<tr>
<td>ENGR-1200</td>
<td>Eng. Graphics &amp; CAD(^1)</td>
<td>1</td>
<td></td>
<td>Science Elective II(^2)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Hum., Arts or Soc. Sci. El.</td>
<td>4</td>
<td></td>
<td>Hum., Arts or Soc. Sci. El.</td>
<td>4</td>
</tr>
<tr>
<td>MATH-2400</td>
<td>Intro. to Differential Eqns.</td>
<td>4</td>
<td>ENGR-2050</td>
<td>Intro to Engineering Design</td>
<td>4</td>
</tr>
<tr>
<td>PHYS-1200</td>
<td>Physics II</td>
<td>4</td>
<td>ENGR-2600</td>
<td>Modeling &amp; Analy. of Uncert</td>
<td>4</td>
</tr>
<tr>
<td>ENGR-2250</td>
<td>Thermal &amp; Fluids Eng. I(^3)</td>
<td>4</td>
<td>CSCI-1190</td>
<td>Beginning C Prog. for Eng.(^3)</td>
<td>1</td>
</tr>
<tr>
<td>ENVE 2110</td>
<td>Intro to Env. Eng.</td>
<td>4</td>
<td></td>
<td>Science Elective II(^2)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Hum., Arts or Soc. Sci. El.</td>
<td>4</td>
<td></td>
<td>Hum., Arts or Soc. Sci El</td>
<td></td>
</tr>
<tr>
<td>CHEM-2250</td>
<td>Organic Chemistry I</td>
<td>3</td>
<td>ENVE-4310</td>
<td>Applied Hydrology &amp; Hydr.</td>
<td>4</td>
</tr>
<tr>
<td>ENVE-4330</td>
<td>Intro. to Air Quality</td>
<td>3</td>
<td>ENVE-4320</td>
<td>Env. Chemodynamics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Professional Devel. II(^4)</td>
<td>2</td>
<td>ENVE-4340</td>
<td>Phycocchem. Proc. In EE</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hum., Arts or Soc. Sci. El.</td>
<td>4</td>
<td></td>
<td>Multidisciplinary Eng. Elec(^5)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Free Elective I</td>
<td>4</td>
<td></td>
<td>Free Elective II</td>
<td>4</td>
</tr>
<tr>
<td>ENGR-4010</td>
<td>Professional Devel. III</td>
<td>1</td>
<td>ENVE-4180</td>
<td>Environmental Proc. Design</td>
<td>3</td>
</tr>
<tr>
<td>ENVE-4150</td>
<td>Env. Eng. Lab.</td>
<td>4</td>
<td>ERTH-4180</td>
<td>Environmental Geology</td>
<td>4</td>
</tr>
<tr>
<td>ENVE-4350</td>
<td>Biological Process in EE</td>
<td>4</td>
<td></td>
<td>Technical Elective II(^6)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Technical Elective I(^6)</td>
<td>3</td>
<td></td>
<td>Free Elective III</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Hum., Arts or Soc. Sci. El.</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. May be taken in any order in the first two semesters. ENGR-1300 may be replaced by ENGR-1310 or CIVL-2961.
2. Choose CHEM-1200 and either BIOL-1010 or another biology course chosen in consultation with adviser. Order does not matter.
3. ENGR-2250 may be replaced by CHME-4010.
4. Choose either PSYC-4170 or STSS-4840.
5. Multidisciplinary engineering elective: Must be an engineering course, chosen in consultation with the adviser (e.g., ENGR-1600, ENGR-4760, CIVL-2030, CIVL-2630, ISYE-4260, ENGR-2530).
6. Technical electives must be selected in consultation with the program adviser (e.g., ENVE-4200, ENVE-4240, ENVE-4210, ENVE-4110). With adviser approval, courses from other disciplines may also be taken. These include Civil Engineering, Chemical Engineering, and Earth and Environmental Sciences (for example, CIVL 2630, CIVL 4150, CHME 4030, ERTH 4710, and others).

128 credits minimum
Helpful Hints – ENVE Curriculum

Following the ENVE curriculum template will allow one to graduate with a BSCE Degree in 4 years. However, because of Co-op, Semester Abroad, and Transfer, one can deviate from the template and still graduate in four years. Listed below are helpful hints on which deviations from the standard template are possible and which should be avoided.

#1) ENGR 2250 Thermal Fluids Engineering is a prerequisite for several courses in the Junior year. Hence, ENGR 2250 should be taken in the Sophomore year, but can be taken in either semester.

#2) Students interested in environmental issues related to soils (landfill design, soil remediation) are encouraged to take Intro. to Geotechnical Engineering, CIVL 2670. It is only offered in the Fall semester. Note that ENGR 2530 Strength of Materials is a prerequisite for CIVL 2670, and can be taken during the summer semester if desired.

#3) ENVE 4180, Environmental Process Design, is a capstone design course offered only in the Spring semester. You should arrange your courses to complete ENVE design courses prior to taking ENVE 4180. These include ENVE 4330 Introduction to Air Quality, ENVE 4310 Applied Hydrology and Hydraulics, ENVE 4340 Physicochemical Processes, and ENVE 4350 Biological Processes.

#4) If you are planning to be away from campus for either the Co-op or Study Abroad program, the best time to pursue these programs is the spring semester, junior year.
Registration

When: Registration for the Spring semester generally occurs in early November. Registration for the Fall semester occurs the preceding Spring, usually in early April. Exact dates are included in the Academic Calendar.

How: Use the Student Information System (SIS) to register for your courses.

Where: There are no assigned rooms for registration. You can register for your classes using any computer with Internet access.

Time tickets
As a student here at Rensselaer, you are issued a "time ticket," which assigns you a specific window of time during which you may register for the next semester. Your time ticket will be sent to your RPI email address, 2 - 3 weeks before registration. Your registration time is assigned based on the number of credit hours you have earned as a student. The table to the right shows the range of earned credit hours associated with each class. Please note that classes which are still in progress or courses which have been graded as "incomplete" do not count towards earned credits, nor do transferred courses and Advanced Placement (AP) credit.

CAPP reports
Your Curriculum Advising and Program Planning (CAPP) report is a planning and advising tool -- available only to undergraduate students -- that allows you to track the progress you're making toward your Bachelor's Degree. You can access your CAPP report via the main menu of the Student Information System (SIS).

<table>
<thead>
<tr>
<th>School of Engineering</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshman</td>
<td>0 - 30</td>
</tr>
<tr>
<td>Sophomore</td>
<td>31 - 60</td>
</tr>
<tr>
<td>Junior</td>
<td>61 - 95</td>
</tr>
<tr>
<td>Senior</td>
<td>96 - 128</td>
</tr>
</tbody>
</table>
Professional/Student Societies

**ASCE (American Society of Civil Engineers) - Faculty Advisor: Prof. Thomas Zimmie, JEC 4038**

With 160,000 members nationwide, the American Society of Civil Engineers is the predominate organization of Civil and Environmental Engineers in the U.S. The Rensselaer student chapter organizes events, lectures by practicing Civil and Environmental Engineers, as well as the annual Steel Bridge and Concrete Canoe competition. Attendance at student chapter lectures is a great way to determine if Civil Engineering is for you.

The ASCE publishes several research journals of interest to environmental engineers, including *Journal of Environmental Engineering*. In addition, ASCE sponsors the Environmental and Water Resources Institute EWRI.

RPI's ASCE chapter holds a meeting usually **every other Wednesday in Low 4050**. The meetings are open to anyone interested in civil engineering and are designed to be a relaxed place for students to learn some practical knowledge about what is going on in the Civil and Environmental Engineering world. (Free pizza and drinks are served). For those who like what they see, becoming a member of ASCE means having access to the many social, community service and networking opportunities that are offered throughout the year.

**Society of Environmental Professionals**-

The purposes of the Chapter are:

- To promote student interest in the environment
- To provide an avenue for the exchange of information and ideas between students and members of professional Associations
- To provide a common ground where students from various disciplines related to air, waste, and water environment management can advance their understanding of environmental management through an organized exchange of knowledge
- To promote a better understanding of the scope and opportunities in air, waste, and water environment management
- To present educational programs of general interest topics in the science of air, waste, and water environment management, as well as other related technological fields
- To encourage its members to participate in the Associations’ conferences, meetings, and social events
Undergraduate Research Program

Departmental faculty are involved in four areas of research - Environmental, Geotechnical, Structures and Transportation. URP opportunities exist in each. They allow students to interact with faculty on their research, apply knowledge learned in the classroom setting, publish journal articles and books alongside faculty and receive credit or supplemental income.

Finding a Project
Most students will solicit URP projects by contacting departmental professors – those they have had in class and others. The key is to determine a project that will interest you as well as finding a faculty member that may want to work with you on a project.

Credit or Funding
You can either earn credit hours (between one and four) for participating in an URP project or you can be paid for the project. If you choose credit, the decision on the number of credit hours is usually decided by the student and the participating faculty member.

Being paid to participate in a URP project can help a student offset some of the costs of college, such as books, lab fees, activities or incidentals that may come up. In the past, students who have participated in the URP for pay have earned up to $3,000 per semester. The majority of participants earn $400 per semester. URP funding comes from two sources:

- Your sponsoring faculty member or department
- The Office of Undergraduate Education

The faculty sponsor or department is responsible for the financial support of your research. In addition, the Office of Undergraduate Education pays URP participants a maximum of $400 per semester in the form of matching funds. Most projects expect eight to twelve hours of work per week. The URP application should be submitted to the Department Coordinator, Tasha McDonough.
### Department of Civil and Environmental Engineering
#### Research Areas and Related Faculty

<table>
<thead>
<tr>
<th>Earthquake Engineering</th>
<th>Structural Engineering</th>
<th>Geotechnical Engineering</th>
<th>Transportation Engineering</th>
<th>Computational Mechanics</th>
<th>Pollutant Fate and Transport</th>
<th>Water Treatment</th>
<th>Site Remediation &amp; Bioremediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tarek Abdoun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xuegang (Jeff) Ban</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gianluca Cusatis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ricardo Dobry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jose Holguin-Veras</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>James (Chip) Kilduff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marianne Nyman</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michael O’Rourke</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Michael Symans</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mourad Zeghal</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomas Zimmie</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### International Programs

Many students at Rensselaer study abroad, usually during their junior or senior years. It is important to plan ahead if you wish to study abroad so that you can still take all the courses required to graduate. A list of study abroad options can be found at: [http://undergrad.rpi.edu/update.do?catcenterkey=84](http://undergrad.rpi.edu/update.do?catcenterkey=84)

For more information on study abroad programs, go to the Office of International Programs, located in Walker 4103, or see the Office of Undergraduate Education website at [http://undergrad.rpi.edu](http://undergrad.rpi.edu) > Office of International Programs.
Cooperative Education

Rensselaer's Co-op program offers a way to apply classroom experience in a business setting. That's important for two reasons:

- As you apply newly-learned technical skills, you will gain an understanding of office dynamics that can only be learned through experience.
- Just as important, you will gain experience that will look good on your resume.

Two things you should consider when planning your co-op assignment are the type of co-op that best suits your needs, and where the co-op assignment fits in your academic plan (please see Helpful Hint #4, page 13).

For more information on Co-op programs, please go to the following website:
http://www.rpi.edu/dept/cdc/coop/coopoverview.html

Co-Terminal BS/MS or BS/ME Program

What Is It?

- The Co-Terminal Graduate degree program offers Rensselaer undergraduates with strong academic records the opportunity to earn both a Bachelor’s and Master’s degree in 5 years while extending their financial aid.

What is the Advantage?

- Undergraduate financial aid will be continued for co-terminal students through their 9th and 10th semester's of study
- Upon graduation, student will earn both their BS and MS degrees simultaneously.

How does it Work?

- Admissions standards for the co-terminal program are the same as those required for Rensselaer's traditional master's programs
- **Co-terminal applications should preferably be submitted before the end of applicants’ junior year**
- Student must:
  - Have a cumulative GPA of 3.0 or above
  - Have completed 90 credits of coursework (including AP credits, transfer credits, and courses in progress)

How do I Apply?

ENVIRONMENTAL ENGINEERING UNDERGRADUATE HANDBOOK 8/24/2010
• Application is made to the Graduate Admissions Office through the Civil and Environmental Engineering Department. The application form is available online through the Graduate Admissions Office website. The Graduate Plan of Study Form is available on the Office of Graduate Education website.

Frequently Asked Questions:

Admission

1. **What if the courses I list on the Plan of Study change?**

   If the courses listed change, an updated plan must be filed with your Department, the Graduate School, and the Office of the Registrar.

Financial Aid, Tuition and Fees

1. **Can I receive both Undergraduate Financial Aid and Graduate TA/RA aid?**

   No - If you receive a Graduate TA/RA you are no longer eligible for undergraduate financial aid.

2. **Do I have to file a FAFSA for my 5th year to get the Undergraduate aid?**

   Yes - you must file a FAFSA, if you receive need based aid

3. **I have a TA from my department. Do I need to notify anyone?**

   No - your department works with the Graduate School to ensure that your TA is processed appropriately. Once you accept a graduate TA, you are no longer eligible for undergraduate financial aid.

Academic

1. **When/how does a student get assigned a graduate adviser?**

   Co-terminal students will continue to work with their undergraduate adviser and should contact their department to be assigned a graduate advisor.

2. **How many credits will I be eligible to register for?**

   For undergraduate students, the maximum number of credit hours is 21. For graduate students, the maximum is 15 credit hours. If most of your courses in a particular semester are at the 6000 level, the 15 credit hour limit would apply.

3. **Should I apply for my undergraduate degree if I will be registered into an 11th semester?**

   If you are continuing into an 11th semester, you will no longer be eligible for undergraduate aid. You should apply for your bachelor's degree at that point.
4. **When do I receive my BS degree? I was supposed to graduate in May but I will be completing 2 more semesters to receive my Master's degree under the co-terminal program?**

You will receive both degrees at the end of your 10th semester. You should file a degree application with the Office of the registrar for each degree at the beginning of the semester in which you will actually graduate with both degrees. See the academic calendar for deadline information.

5. **Can I use a course for both my undergraduate and graduate degree?**

No - credits applied toward satisfying requirements of the undergraduate degree cannot be used to satisfy the requirements for the master's degree.

6. **I finished my 9th semester but decided not to continue in the master's program. How do I receive my BS degree?**

You must first, formally withdraw from the co-terminal program. This is done using the Graduate Student Request for Change of Status form.

You must then file a Degree Application for the next graduation date. Rensselaer has three official graduation dates - the end of August, the end of December, and mid-May. Check the academic calendar for application submission deadlines.

7. **Can I still designate courses as Pass/No Credit?**

Co-terminal students are subject to graduate degree program guidelines after they've earned the minimum number of credits required for their bachelor’s degree (which will range from 124 to 128 depending on the School). Any courses taken after a student has reached the minimum will be subject to graduate level policies, and graduate policies prohibit designating a graduate course as Pass/No Credit.

8. **Can I participate in the Commencement ceremony with my class?**

You must meet the criteria for participation and file a petition, available in the Registrar's Office.

Co-terminal application:  [http://admissions.rpi.edu/graduate/Co-TerminalBS-MS_Application_and_Procedures.pdf](http://admissions.rpi.edu/graduate/Co-TerminalBS-MS_Application_and_Procedures.pdf)
## Areas of Study/Degrees
- Civil Engineering, MS, MEng, PhD, DEng
- Environmental Engineering, MS, MEng, PhD, DEng
- Transportation Engineering, MS, MEng, PhD, DEng
- Typical Degree Requirements
  - MS 30 credits (24-27 coursework, 3-6 thesis)
  - MEng 30 credits coursework
  - PhD 42 credits beyond BS plus doctoral thesis

## Research Areas
We offer a wide range of disciplines that are sufficiently flexible to accommodate individual interests, but the main research areas of interest are separated into several broad categories:

- **Earthquake Engineering (Civil)**
- **Structural Engineering (Civil)**
- **Geotechnical Engineering (Civil)**
- **Transportation Engineering (Civil)**
- **Computational Mechanics (Civil)**
- **Pollutant Fate and Transport (Environmental)**
- **Water Treatment (Environmental)**
- **Waste Treatment (Environmental)**
- **Site Remediation and Bioremediation (Environmental)**
- **Environmental Systems (Environmental)**
- **Environmental Biotechnology (Environmental)**
- **Indoor Air Quality and Water Quality (Environmental)**

## Admission
- Submit on-line at: [http://gradadmissions.rpi.edu/](http://gradadmissions.rpi.edu/)
- Deadlines are January 1 for Summer and Fall admission and August 15 for Spring admission
  
  You will need: a well-written Statement of Background & Goals; official transcripts from all colleges attended; at least 2 letters of recommendation (preferably from faculty); official GRE scores (general test only, minimum 550 Verbal/550 Quantitative/4.0 Analytical) and official TOEFL or IELTS scores (required for all international applicants, minimum 570 TOEFL or IELTS minimum 6.5); Bachelor’s GPA 3.0 or higher; non-refundable application fee.

## Financial Aid/Tuition
- Awards are made based on merit, not on need, and priority is given to doctoral candidates.
- Apply for financial aid through the admission application, no separate form is required.
- Financial aid is available in the form of Fellowships, Teaching Assistantships and Research Assistantships.
- International students are eligible for all forms of aid except some fellowships that require US citizenship.
- Tuition for the 2010-2011 academic year is $39,600; fees and insurance are $1,938; Living expenses, books and supplies can vary widely but are estimated at approximately $12,995.

## Contact Us
Kimberly Boyce, Department Admissions Coordinator, Department of Civil and Environmental Engineering
Phone: 518-276-6941
Email: boycek@rpi.edu
[http://www.cee.rpi.edu](http://www.cee.rpi.edu)
FAQs
What do I do if a class I want to register for is full?
Meet with the instructor of the course and request to be admitted to the course. If the class is a core/required course every effort will be made to accommodate the request. If this is an elective course you may be asked to take it in a subsequent semester.

How do I add/drop a course?
You may use the Student Information System (SIS) to add or drop courses. Generally speaking, from the beginning of the semester, you will have two weeks to add courses and eight weeks to drop them. Please refer to the Academic Calendar for specific add and drop deadline dates.
If you wish to petition to add or drop classes after the published deadline, you may do so using a Late Add/Drop Form. Please note that after the instructors signature (if required), the form must also be approved by the Advising and Learning Assistance Center.