Undergraduate Student Handbook

Environmental Engineering Municipal Processes Emphasis

University of New Hampshire Department of Civil Engineering

Academic Year 2014 – 2015
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Welcome!

On behalf of the environmental engineering faculty and staff, welcome to the University of New Hampshire and the 2014-2015 academic year. You have taken the first step toward an exciting, rewarding and cutting edge career in environmental engineering.

Environmental engineers plan, design and construct public and private facilities to minimize the impact of human activity on the environment and to protect human health. They are strong contributors to society, and provide responsible social, economic and environmental benefits and enhance the quality of life around the world. Environmental engineers with a municipal processes emphasis design and build drinking water treatment systems, municipal and industrial wastewater treatment plants, solid waste management facilities, contaminated ground water remediation systems, and hazardous waste remediation facilities.

The environmental engineering municipal processes (ENE MP) accredited degree program’s strong analytical core and multidisciplinary focus, combining engineering and the sciences, prepares graduates for many opportunities in public, private, or academic sectors.

In this handbook, you will find useful and pertinent information regarding our programs, our facilities and resources, and our faculty and staff. To ensure that your experience at UNH is fulfilling, we encourage you to take advantage of the many opportunities available to you while you are here, such as student organizations, student competitions, and undergraduate research.

Our faculty is renowned for excellence in teaching and research. We want you to succeed and be prepared to face the challenges of today and tomorrow. Please consult the handbook for information, meet with your faculty academic advisor or any of our faculty or staff, if you have any academic or non-academic questions, conflicts, problems or issues. We are here to help you!

Best wishes in the academic year ahead,

Nancy E. Kinner, Ph.D.
University Professor
Professor of Civil/Environmental Engineering
ENE MP Undergraduate Coordinator
A. ENE Program Philosophy

1. Program Description

The Environmental Engineering (ENE) Program of the College of Engineering and Physical Sciences (CEPS) at the University of New Hampshire offers a Bachelor of Science in Environmental Engineering (ENE). There are two curricular emphases within the ENE Program: Industrial Processes (IP) and Municipal Processes (MP). The IP emphasis of ENE is a process-based curriculum that draws on the principles of chemistry, physics, mathematics and engineering sciences. The ENE IP curriculum is designed to provide training not only for end-of-pipe pollution control technologies, but also for expertise in process engineering and process design essential for achieving the objectives of pollution curtailment and prevention. Environmental engineers graduating from the MP emphasis plan, design and construct public and private facilities to minimize the impact of human activity on the environment and to protect human health.

The UNH Environmental Engineering Program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 – telephone: (410) 347-7700. It is important that the engineering program from which you graduate is ABET-accredited because that is one of the requirements in the process of obtaining a Professional Engineering (PE) license. An ABET-accredited engineering program is defined by its educational objectives and outcomes and its curriculum. Program Educational Objectives describe the accomplishments expected of a program’s graduates during the first few years after graduation. The educational objectives are unique to the program and determined by the faculty and stakeholders (e.g., employers of graduates). Program Outcomes describe what students must know and be able to do at time of graduation. The Curriculum outlines the academic path that students in the program take to meet the outcomes by the time of graduation and ultimately, the objectives they accomplish after graduation.

2. Mission Statement

The Environmental Engineering (ENE) Program at the University of New Hampshire offers an undergraduate degree in environmental engineering that prepares students for productive careers in the public and private sectors and graduate studies. The Program emphasizes fundamental principles in environmental engineering and design, built upon a strong base of chemistry, physics, mathematics and engineering science. The Program prepares its students to work in multidisciplinary teams that analyze, formulate and communicate sustainable solutions to complex environmental problems. The importance of developing sustainable solutions that provide economic, social and environmental benefits to society is emphasized. The Program instills in its students an appreciation of the responsibilities of engineers to society and teaches them the skills necessary to continue learning and improving their professional expertise throughout their careers. The ENE degree program provides an opportunity for students to specialize in Industrial or Municipal Processes. The curricula prepare students to plan and design safe systems to minimize the impact of human activity on the environment and protect human health.
### 3. ENE Program Educational Objectives and ENE MP Outcomes.

<table>
<thead>
<tr>
<th>ENE Program Objectives</th>
<th>ENE MP Emphasis Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> ENE Program graduates will have the skills, experience and knowledge to pursue successful careers as environmental engineers. ENE Program graduates will have demonstrated the ability to: (a) identify information needs; (b) locate information resources, and/or design laboratory or field experiments to attain required information; and (c) evaluate and synthesize data with sound engineering principles, methodologies, and the latest technology into creative, sustainable, safe and economical engineering solutions to environmental engineering problems. The solutions they develop will minimize the impact of human activities on the environment and protect human health. The ENE Program will provide qualified students with a foundation for advanced studies in environmental engineering.</td>
<td>1.1 Graduates will be competent in the use of current engineering tools and computer software in engineering practice.</td>
</tr>
<tr>
<td></td>
<td>1.2 Graduates will have the foundation to independently learn new tools and software.</td>
</tr>
<tr>
<td></td>
<td>1.3 Graduates will have the ability to: locate, compile and use information; design and perform experiments to satisfy specific information needs; and critically analyze and interpret data and present results.</td>
</tr>
<tr>
<td><strong>2.</strong> ENE Program graduates will have demonstrated oral and written communication skills to clearly explain engineering options and recommend solutions to stakeholders.</td>
<td>2.1 Graduates will have the ability to effectively communicate and defend ideas in technical reports and correspondence.</td>
</tr>
<tr>
<td></td>
<td>2.2 Graduates will have the ability to speak before a group, effectively convey information to technical and non-technical audiences, and use visual aids.</td>
</tr>
<tr>
<td><strong>3.</strong> ENE Program graduates will have demonstrated in-depth knowledge within environmental engineering and an awareness of potential social, economic, political, and environmental impacts of engineering practices. ENE Program graduates will have an appreciation of the contribution of environmental engineers to the benefit of society and the responsibilities of a professional environmental engineer.</td>
<td>3.1 Graduates will have basic competence in math, science, and engineering principles and be able to apply this knowledge to identify and solve engineering problems.</td>
</tr>
<tr>
<td></td>
<td>3.2 ENE MP graduates will have obtained a working knowledge in the basic ENE disciplines of process engineering, fluid mechanics, solid and hazardous waste, bioenvironmental, physiochemical, air pollution and project engineering.</td>
</tr>
<tr>
<td></td>
<td>3.3 Graduates will have had the opportunity to develop a more specialized knowledge base in more than one specialty.</td>
</tr>
<tr>
<td></td>
<td>3.4 Graduates will have an ability to design environmental engineering systems that include considerations such as risk, uncertainty, sustainability, life-cycle principles, and environmental impacts.</td>
</tr>
<tr>
<td></td>
<td>3.5 Graduates will have an understanding of professional and ethical responsibility.</td>
</tr>
<tr>
<td></td>
<td>3.6 Graduates will understand the impact of engineering solutions in a global, economic, environmental, and societal context.</td>
</tr>
<tr>
<td><strong>4.</strong> ENE Program graduates will work as part of multidisciplinary teams to arrive at solutions to environmental engineering problems.</td>
<td>4.1 Graduates will have the ability to interact and collaborate on multidisciplinary teams.</td>
</tr>
<tr>
<td></td>
<td>4.2 Graduates will be able to critically analyze and design systems, components, or processes to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, and sustainability.</td>
</tr>
<tr>
<td><strong>5.</strong> ENE Program graduates will be prepared to obtain professional engineering licensure. ENE Program graduates will have the capacity to continue learning and improving their professional expertise and skills by participating in professional associations, conferences, workshops, and courses, and will understand the importance of continued professional development.</td>
<td>5.1 Graduates will understand contemporary issues within the environmental engineering profession and be aware of how those issues impact environmental engineering practice.</td>
</tr>
<tr>
<td></td>
<td>5.2 Graduates will have taken or be prepared to take the Fundamentals of Engineering examination.</td>
</tr>
<tr>
<td></td>
<td>5.3 Graduates will have been encouraged to join and become active in professional organizations (e.g., ASCE-EWRI, AWWA, NEWWA, WEF, SWE, EWB/SWB, Tau Beta Pi, Order of the Engineer).</td>
</tr>
<tr>
<td></td>
<td>5.4 Graduates will recognize the need for and have the ability to engage in life-long learning.</td>
</tr>
</tbody>
</table>
## 4. ENE MP Grading Metric

**ENE PROGRAM: MP EMPHASIS, UNIVERSITY OF NEW HAMPSHIRE**  
(AS DECIDED BY THE ENE MP FACULTY, 7 JUNE 2005, DURHAM, NH)

<table>
<thead>
<tr>
<th>Grade</th>
<th>UNH Standard</th>
<th>ENE MP Standard</th>
<th>Level of Competency</th>
<th>Perception of Performance by an Experienced Engineer</th>
<th>Quality of Work</th>
<th>Need for Further Review and Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (4.0)</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Mastery. Above level expected of a typical student or new hire at this level.</td>
<td>Experienced engineer would be impressed by quality of work, would be pleased by work output, and would see leadership potential.</td>
<td>Creative. Innovative. Student finds new ways to solve difficult problems. Few minor errors, if any, exist. No significant omissions. Work is clear, concise, readily checked, and can serve as a reference to others.</td>
<td>Student has mastered the subject and is capable of teaching others.</td>
</tr>
<tr>
<td>B (3.0)</td>
<td>Superior</td>
<td>Good</td>
<td>Competent. Level expected of a typical student or new hire.</td>
<td>Experienced engineer would be satisfied.</td>
<td>Occasional errors or minor omissions. On review, student can recognize problems and can correct them without supervision.</td>
<td>Student is capable and can review topics on his or her own where needed.</td>
</tr>
<tr>
<td>C (2.0)</td>
<td>Satisfactory, Competent</td>
<td>Fair</td>
<td>Minimal level of competence. Below level expected of an entry-level engineer for assignment of work in this area.</td>
<td>Experienced engineer would be concerned.</td>
<td>Some errors or omissions present. Student may not find problems independently but can correct them with the aid of reference material.</td>
<td>Deficiencies exist. Student encouraged to study reference materials</td>
</tr>
<tr>
<td>D (1.0)</td>
<td>Marginal</td>
<td>Poor</td>
<td>Incompetent. Should not be assigned work in this area.</td>
<td>Experienced engineer would be disappointed.</td>
<td>Work riddled with errors or substantially incomplete. Student cannot find problems and may not be able to correct them without direct supervision and guidance.</td>
<td>Poor understanding of the subject. Student advised to repeat coursework.</td>
</tr>
<tr>
<td>F (0.0)</td>
<td>Failure</td>
<td>Failure</td>
<td>Incapable of producing useful work in this area.</td>
<td>Experienced engineer would be alarmed, would certainly reassign the employee, and might consider firing a new hire for performing at this level.</td>
<td>Work of little or no value. Student may not be able to correct problems even with direct supervision.</td>
<td>Little or no understanding. Student must repeat coursework in its entirety.</td>
</tr>
</tbody>
</table>
5. ENE MP ABET Engineering Tools
June 27, 2014

<table>
<thead>
<tr>
<th>Tool</th>
<th>Introductory Courses</th>
<th>Teaching Method</th>
<th>Application Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spreadsheet (e.g., Excel)</td>
<td>ENE 400, 401</td>
<td>HW Assignments</td>
<td>CiE 642, ENE 742, ENE 645, ENE 744, ENE 749, ENE 756, ENE 784/788, Hydraulics Elective, ESCI 654</td>
</tr>
<tr>
<td>Graphing (e.g. Excel)</td>
<td>ENE 400, 401</td>
<td>HW Assignments</td>
<td>CiE 642, ENE 742, ENE 645, ENE 744, ENE 749, ENE 756, ENE 784/788, Hydraulics Elective, ENE 709, ESCI 654</td>
</tr>
<tr>
<td>Life Cycle Analysis</td>
<td>ENE 744, 751</td>
<td>HW Assignments</td>
<td>ENE 741, ENE 751</td>
</tr>
<tr>
<td>Word Processing (e.g., Word)</td>
<td>ENE 400, 401</td>
<td>Papers</td>
<td>CiE 642, Hydraulics Elective, CiE 757, ENE 642, ENE 645, ENE 744, ENE 749, ENE 756, ENE 784/788, ENE 709, ENE 520, ENE 709</td>
</tr>
<tr>
<td>Presentation Graphics (e.g., PowerPoint)</td>
<td>ENE 400, 401</td>
<td>Presentations</td>
<td>CiE 642, ENE 645, ENE 756, ENE 709</td>
</tr>
<tr>
<td>Computer-Aided Drawing (CAD)</td>
<td>Tech 564</td>
<td>Lecture/Lab</td>
<td>ENE 645, ENE 784/788</td>
</tr>
<tr>
<td>Project Scheduler (e.g., MS Project, Quest)</td>
<td>CIE 533</td>
<td>Lecture/Lab</td>
<td>ENE 645, ENE 784/788</td>
</tr>
<tr>
<td>Cost Estimating (e.g., R.S. Means Cost Works)</td>
<td>CIE 533</td>
<td>Lecture/Lab</td>
<td>ENE 645, ENE 784/788</td>
</tr>
<tr>
<td>Information Sources and Retrieval</td>
<td>ENE 401</td>
<td>Presentation</td>
<td>ENE 645, ENE 756, ENE 784/788, ENE 709</td>
</tr>
<tr>
<td>Modeling (e.g., Streeter Phelps, Minteq)</td>
<td>ENE 756</td>
<td>Lecture/Lab/Projects/Homework Assignments</td>
<td>ENE 749, ESCI 654, ENE 744</td>
</tr>
<tr>
<td>GIS</td>
<td>GIS Elective</td>
<td>Lecture/Lab/Projects/Homework Assignments</td>
<td></td>
</tr>
<tr>
<td>Statistics (e.g., JMP)</td>
<td>MATH 644</td>
<td>Statistics Course</td>
<td>CiE 745, CiE 757, ENE 744, ESCI 654</td>
</tr>
</tbody>
</table>
### Public Health and Geospatial Science Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIE 796</td>
<td>GIS in Water Resources</td>
<td>4</td>
</tr>
<tr>
<td>NR 757</td>
<td>Remote Sensing of the Env</td>
<td>4</td>
</tr>
<tr>
<td>NR 760</td>
<td>GIS in Natural Resources</td>
<td>4</td>
</tr>
<tr>
<td>NR 782</td>
<td>Monitoring Forest Health</td>
<td>4</td>
</tr>
</tbody>
</table>

### Hydraulics Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIE 741</td>
<td>Open Channel Flow</td>
<td>3</td>
</tr>
<tr>
<td>745</td>
<td>Engineering Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>755</td>
<td>Pressured Water Systems</td>
<td>4</td>
</tr>
<tr>
<td>757</td>
<td>Coastal Engineering</td>
<td>3</td>
</tr>
<tr>
<td>758</td>
<td>Stormwater Man. Designs</td>
<td>4</td>
</tr>
<tr>
<td>759</td>
<td>Stream Restoration</td>
<td>3</td>
</tr>
</tbody>
</table>

### Environmental and Civil Engineering Non-Design Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENE 708</td>
<td>Indust. Process and Design</td>
<td>4</td>
</tr>
<tr>
<td>743</td>
<td>Enviro. Sampling and Analysis</td>
<td>4</td>
</tr>
<tr>
<td>747</td>
<td>Marine Pollution</td>
<td>4</td>
</tr>
<tr>
<td>CIE 741</td>
<td>Open Channel Flow</td>
<td>3</td>
</tr>
<tr>
<td>745</td>
<td>Engineering Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>750</td>
<td>Ecotoxicology</td>
<td>3</td>
</tr>
<tr>
<td>755</td>
<td>Pressured Water Systems</td>
<td>4</td>
</tr>
<tr>
<td>757</td>
<td>Coastal Engineering</td>
<td>3</td>
</tr>
<tr>
<td>758</td>
<td>Stormwater Man. Designs</td>
<td>4</td>
</tr>
<tr>
<td>759</td>
<td>Stream Restoration</td>
<td>3</td>
</tr>
<tr>
<td>766</td>
<td>Geoenvironmental Eng.</td>
<td>3</td>
</tr>
<tr>
<td>OE 710</td>
<td>Ocean Measurements Lab</td>
<td>4</td>
</tr>
</tbody>
</table>

### Environmental and Civil Engineering Design Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENE 748</td>
<td>Solid and Haz. Waste Design</td>
<td>4</td>
</tr>
<tr>
<td>CIE 755</td>
<td>Pressured Water Systems</td>
<td>4</td>
</tr>
<tr>
<td>758</td>
<td>Stormwater Man. Designs</td>
<td>4</td>
</tr>
<tr>
<td>759</td>
<td>Stream Restoration</td>
<td>3</td>
</tr>
<tr>
<td>781</td>
<td>Green Building Design</td>
<td>3</td>
</tr>
<tr>
<td>797</td>
<td>Asset Management</td>
<td>4</td>
</tr>
</tbody>
</table>

**Note:** If CIE 755, 758 or 759 are taken as the Hydraulics Electives, they cannot be used as a Design Elective.

### Engineering Laboratory Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIE 665</td>
<td>Soil Mechanics</td>
<td>4</td>
</tr>
<tr>
<td>ENE 709</td>
<td>Fundamentals of Air Pollution</td>
<td>4</td>
</tr>
<tr>
<td>743</td>
<td>Enviro. Sampling and Analysis</td>
<td>4</td>
</tr>
<tr>
<td>OE 710</td>
<td>Ocean Measurements Lab</td>
<td>4</td>
</tr>
</tbody>
</table>

**Note:** If a course from this list is taken to satisfy the Hydraulics Elective, it cannot be used as a non-design elective.

**Note:** Any course that is a design elective may be used as a non-design elective but, it cannot be used as both a design and non design elective.

### Hydrology Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESCI 705</td>
<td>Principles of Hydrology</td>
<td>4</td>
</tr>
<tr>
<td>710</td>
<td>Groundwater Hydrology</td>
<td>4</td>
</tr>
<tr>
<td>CIE 745</td>
<td>Engineering Hydrology</td>
<td>3</td>
</tr>
<tr>
<td>750</td>
<td>Ecotoxicology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Note:** If CIE 745, or 750 are taken to satisfy the Hydrology Elective, they cannot be used as a non-design elective.
2. ENE Course Descriptions

UPDATED

ENE 400 - Environmental Engineering Lectures I
Credits: 2.00
Introduces the profession, the environmental engineer as planner, designer, problem solver, and interdisciplinary team player; and the goals of the environmental engineering curriculum. Lectures by faculty and practitioners. Introduction to computer and problem-solving skills required for environmental engineering. Engineering ethics.

ENE 401 - Environmental Engineering Lectures II
Credits: 1.00
Introduces the concept of integrated design and project planning and management in environmental engineering. Field trips to environmental engineering sites and projects. Prereq: ENE 400. Includes CEPS and Continuing Education. Cr/F.

ENE 520 - Environmental Pollution and Protection: A Global Context
Credits: 4.00
Introduces environmental science and engineering and the anthropogenic causes of environmental change. Emphasizes the causes, effects, and controls of air, water, and land pollution. The political, ecological, economic, ethical, and engineering aspects of environmental pollution and control are discussed. Field trips. Writing intensive.

ENE 612 - Unit Operations Laboratory I
Credits: 3.00
Selected experiments in fluid mechanics, heat transfer, and unit operations, with emphasis on environmental engineering. Writing intensive.

ENE 645 - Fundamental Aspects of Environmental Engineering
Credits: 4.00
Application of fundamental concepts of mass balance in treatment processes. Physical, chemical, and biological aspects of pollution control, and design concepts for operations and processes used in environmental engineering are discussed. Concepts of engineering ethics are presented. Students participate in a design project that involves an oral presentation and written report. Prereq: CHEM 404, CIE 642, ENE 520; or permission. Writing intensive

ENE 696 - Field Experience
Credits: 1.00
Based on appropriate career-oriented work experience in environmental engineering. Student can get one credit for field experience. A written final report is required as well as permission of student's adviser.
ENE 697 - Internship  
Credits: 2.00  
Off-campus work in the environmental engineering field for on-the-job skill development. Needs to be supervised by an environmental engineering faculty member; and a proposal for the internship must be submitted and have permission of the ENE faculty prior to the start of the internship. Prereq: permission. IA (continuous grading).

ENE 708 - Industrial Process and Design  
Credits: 4.00  
Introduces cost engineering. Application of acquired skills to design of chemical processes. Individual major design project required. Safety for industrial processes. Lab. (Also offered as CHE 708.) Writing intensive.

ENE 709 - Fundamentals of Air Pollution and Its Control  
Credits: 4.00  

ENE 713 - Unit Operations Laboratory II  
Credits: 3.00  
Selected experiments in mass transfer, stagewise operations, thermodynamics, and kinetics with emphasis on environmental engineering. Writing intensive.

ENE 742 - Solid and Hazardous Waste Engineering  
Credits: 3.00  
A thorough examination of the problems that exist in hazardous and solid waste management are presented in terms of the current regulations and engineering approaches used to develop solutions. Topics include risk-based decision making, transport and fate of contaminants, and the fundamental physical, chemical, and biological concepts, which make up the basis for technological solutions to these waste management problems. Case studies are used throughout the course to highlight key concepts and provide real-world examples. Pre- or Coreq: ENE 645 or permission.

ENE 743 - Environmental Sampling and Analysis  
Credits: 4.00  
Theory of analytical and sampling techniques used in environmental engineering. Topics include potentiometry, spectroscopy, chromatography, automated analysis, quality control, sampling design, and collection methods. Methods discussed in lecture are demonstrated in labs. Prereq: CHEM 404 and ENE 645 or permission. Lab.
ENE 743W - Environmental Sampling and Analysis  
Credits: 4.00  
Theory of analytical and sampling techniques used in environmental engineering. Topics include potentiometry, spectroscopy, chromatography, automated analysis, quality control, sampling design, and collection methods. Methods discussed in lecture are demonstrated in labs. Prereq: CHEM 404 and ENE 645 or permission. Lab. Writing intensive.

ENE 744 - Physicochemical Treatment Design  
Credits: 4.00  
Selection, design, and evaluation of advanced unit processes employed in physicochemical treatment of waters, wastewaters, and hazardous wastes. Discusses preparation of alternative designs and economic analysis. Emphasizes treatment schemes based on experimental laboratory or pilot studies. Prereq: ENE 645, 749 or permission. Lab.

ENE 746 - Bioenvironmental Engineering Design  
Credits: 4.00  
Selection, design, and evaluation of unit processes employed in biological treatment of waters, wastewaters, and hazardous wastes. Preparation of engineering reports, including developing design alternatives and economic analysis, is required. Prereq: ENE 645 and ENE 756 or permission. Writing intensive.

ENE 747 - Introduction to Marine Pollution and Control  
Credits: 4.00  
Introduces the sources, effects, and control of pollutants in the marine environment. Dynamic and kinetic modeling; ocean disposal of on-shore wastes, shipboard wastes, solid wastes, dredge spoils, and radioactive wastes; and oil spills. Prereq: ENE 645 or permission.

ENE 748 - Solid and Hazardous Waste Design  
Credits: 4.00  
Selection, design, and evaluation of unit processes employed in the treatment of solid wastes and hazardous wastes will be studied. Topics include design of materials recovery facilities, landfills, waste-to-energy facilities and hazardous waste site remedial technologies. A group term project taken from a real-world project will be required. An oral presentation by the group and preparation of a final written engineering report including alternative evaluation, permits, scheduling and economic analysis will be required from each group. Prereq: ENE 742 or permission. Writing intensive.

ENE 749 - Water Chemistry  
Credits: 4.00  
Emphasizes the use of chemical equilibrium principles and theory, calculations, and applications of ionic equilibrium stresses. Topics include thermodynamics, kinetics, acid/base, complexation, precipitation/dissolution, and redox equilibria. Computer equilibrium modeling is presented. Prereq: CHEM 404 or CHEM 405.
ENE 751 - Introduction to Sustainable Engineering  
**Credits: 3.00**  
This course begins with exploration of the precept that we live in, and must design engineering works for, a world with a finite supply of natural resources and with limited life support capacity. Tools for sustainability engineering are the focus of the course, which includes life cycle analysis and life cycle impact analysis, the metrics and mass and energy flow analyses used in the field of industrial ecology, and environmental management systems.

ENE 752 - Process Dynamics and Control  
**Credits: 4.00**  
Dynamic behavior of chemical engineering processes described by differential equations, feedback control concepts and techniques, stability analysis, application in pollution control. Lab. (Also listed as CHE 752.)

ENE 756 - Environmental Engineering Microbiology  
**Credits: 4.00**  
Concepts of environmental engineering microbiology. Topics include taxonomy of species important in environmental engineering processes; microbial metabolism, interaction, and growth kinetics in environmental treatment processes; biogeochemical cycling in water; and effects of environmental parameters on environmental engineering microbial processes. Laboratories focus on microbiological methods and laboratory-scale biological treatment experiments. Prereq: ENE 520 and CIE 642 or permission. Lab. Writing intensive.

ENE 784 - Introduction to Project Planning and Design  
**Credits: 1.00**  
Part one of a two part sequence. Student groups develop a project statement to address a significant environmental engineering system design. Each team prepares a project plan to be executed in ENE 788, part two of this sequence. Open only to Environmental Engineering majors. Cr/F.

ENE 788 - Project Planning and Design  
**Credits: 3.00**  
Student groups formed in multidisciplinary design teams to prepare a design plan for a large-scale environmental engineering system including consideration of budgetary constraints, regulatory requirements, and environmental impacts. Each team prepares a final written report and gives a formal presentation. Prereq: senior environmental engineering major or permission. Writing intensive.
**ENE 795 - Independent Study**

**Credits:** 1.00 to 4.00
A limited number of qualified seniors is permitted to pursue independent studies under ENE faculty guidance. Seniors write terminal thesis reporting the results of their investigations. May be repeated to a maximum of 4 credits. Prereq: permission of ENE faculty member involved.

**ENE 797 - Special Topics**

**Credits:** 1.00 to 4.00
Advanced or specialized topics not normally covered in the regular course offerings. May be repeated to a maximum of 4 credits, but not in duplicate areas. Prereq: permission.

**ENE 799H - Senior Honors Thesis**

**Credits:** 4.00
Students in the honors program in environmental engineering complete a project under the direction of a faculty sponsor resulting in a written thesis which must be accepted by the sponsor by the end of the second semester, senior year. Four credits total during senior year; 3 of which may be used to fulfill an ENE non-design elective.
3. Required Courses

Discovery Requirements

Courses required by the ENE MP major fulfill #1-6 Discovery requirements. Students select electives to satisfy the #7-11 below – one elective each.

1. One course in Writing Skills
   a. ENE MP students are required to take ENGL 401 which satisfies this requirement

2. One course in Quantitative Reasoning
   a. ENE MP students are required to take MATH 425 which satisfies this requirement

3. One Inquiry course to be completed (if possible) in the first or second year. Inquiry 444 course or inquiry attribute course may be taken from #7-11 below.

4. One course in Biological Science
   a. ENE MP students are required to take ENE 756 which satisfies this requirement

5. One course in Physical Science
   a. ENE MP students are required to take PHYS 407 which satisfies this requirement

6. One course in Environment, Technology, and Society
   a. ENE MP students are required to take ENE 520 which satisfies this requirement

7. One course in Historical Perspectives

8. One course in World Cultures (may be also satisfied by approved study abroad programs)

9. One course in Fine and Performing Arts

10. One course in Social Science

11. One course in Humanistics

12. The senior capstone design requirement is satisfied by ENE 784 and 788

These courses cannot be taken on a Pass/Fail basis. No single course may be counted in more than one Discovery group.

If you have questions or problems concerning your Discovery Requirements, call a degree analyst at (603) 862-1594 or (603) 862-1592, or write c/o Degree Analyst, Registrar’s Office, Stoke Hall, Durham, NH 03824, or stop by the Graduation Department at the Registrar’s Office in Stoke Hall.

Program Requirements

The ENE MP major also requires students to select one technical elective, one engineering laboratory elective, and three CiE/ENE electives (totaling 10 credits), one of which must be a design elective.

4. Program Policies and Requirements

To enter the required 600-level courses in the junior year, students:
   a. must have a minimum grade-point average of 2.00 in all mathematics, physics, chemistry, and engineering courses: Math 425, Math 426, Math 527, Phys 407, CiE 525, Chem 405, ENE 520.
   b. must have achieved an overall grade point average of 2.00 or greater

To graduate with a bachelor of science in environmental engineering, a student must:
a. earn 128 or more credits,
b. achieve credit for the ENE MP program’s major and elective courses
c. satisfy the University’s Discovery requirements,
d. satisfy the University’s writing intensive course requirements,
e. earn a cumulative grade point average of 2.00 or better for all courses, and earn a cumulative grade point average of 2.00 or better for all engineering courses.

5. Writing Requirements

The ENE MP curriculum includes seven writing intensive courses thereby not only satisfying but exceeding the University’s writing requirement. The program’s writing intensive courses are: ENGL 401, ENGL 502, ENE 520, CIE 642, ENE 645, ENE 746, and ENE 788.

6. Transfer Credits

Current UNH undergraduates students wishing to transfer credits from another institution should complete a Transfer Credit/Prior Approval Form (available at the Registrar's Office) before taking courses elsewhere in order to establish the number of credits to be accepted and the Discovery and/or major requirement satisfied by the course.

Students complete the Transfer Credit/Prior Approval Form, supply course descriptions, and submit form to the Registrar's Office.

GENERAL INFORMATION

- Transfer credit is awarded for completed courses with a grade of C or better, provided those courses are comparable to courses offered at UNH.
- Each course must carry at least 3 semester credits to qualify for Discovery consideration.
- A course taken at another institution may not be used under the University repeated course rule. If credit was received for a UNH course equivalent to the course taken at another institution no transfer credit will be allowed (Departments may accept equivalent course work at other institutions for grade only - no credit to satisfy departmental requirements).
- Credit will not be awarded for any course taken the semester immediately following any academic suspension or dismissal from UNH.
- No portion of the student's grade point average will transfer; that is, external averages will not be calculated with UNH grades.
- Students attending other than UNH-sponsored programs must take a leave of absence (if qualified), or withdraw and apply for re-admission prior to returning to the University. This does not apply to attendance at summer courses.
• The last quarter of a student's total credits should be taken at UNH. If transfer credits fall within this range the student must request a waiver of senior residency from the college dean, using the normal university petition form.

• Upon completions of course work the student must request an official transcript be sent to:

  UNH Registrar's Office
  11 Garrison Avenue
  Durham, NH  03824-3511

7. Exchange Programs

ENE MP majors wishing to participate in exchange programs must achieve a cumulative grade point average of 3.00 or better in all MATH, PHYS, CHEM, CIE, and ENE courses taken to date at the end of each of the second and third semesters prior to their exchange semester and must have a minimum of 32 credits. Students must also be in good standing with the student conduct system. ENE MP students are required to take ENE 645 (typically a Spring Junior semester class) at UNH and cannot count a study abroad or a transfer course for this requirement. For more information, check out the website http://www.ceps.unh.edu/study-abroad

Budapest, Hungary

Through this program, UNH engineering students can take classes in Hungary at the Budapest University of Technology and Economics (BME) during their fall semester of their junior year.

This is a UNH Managed Program (http://www.unh.edu/cie/study-abroad-programs) and you’ll still be a UNH student (all financial aid arrangements stay in effect), the classes are taught in English, and the classes you take are already selected for you so you don’t fall behind your colleagues that stay in the U.S. Application is February of your sophomore year.

Edinburgh, Scotland

ENE MP students have a special opportunity to study at the Heriot-Watt University just outside of Edinburgh, Scotland in the spring semester of their sophomore year. With this program, you work with your advisor and choose Heriot-Watt courses that will work so you can graduate on time.

This is a UNH Exchange Program (http://www.unh.edu/cie/study-abroad-programs) so you’ll still be a UNH student paying UNH tuition. The deadline for application for this program is mid-September of your sophomore year.

Other study abroad or study within the U.S. opportunities may be available or may be arranged separately by the student in consultation with the UNH Center for International Education as well as the student’s academic advisor and the ENE MP study abroad advisor.

Contact: Environmental Engineering MP Students: James P. Malley, Jr. – 603-862-1449
8. Professional Registration

The Fundamentals of Engineering or FE exam is given in October and April every year. This is a day-long examination covering science, chemistry, electrical engineering and computer science at the level you will have experienced these topics in your undergraduate courses. The FE exam is the first step toward registration as a professional engineer. After a specified number of years of professional practice you are then qualified to take the Professional Engineering exam, which is much narrower in scope, but at level of greater depth in the area of professional practice of your choice. That is the final examination in the process of obtaining professional registration. Depending upon the nature of the work that you do, professional registration may be a requirement. The best time to take the FE exam is when you are a senior as your familiarity with the various topics is at its best. Applications, exam dates, and deadlines are available via the FE website at www.state.nh.us/jtboard/home.htm. The College of Engineering and Physical Science (CEPS) offers a refresher course during the Spring semester (TECH 601).

9. Honors in Major – Environmental Engineering

1. Students are required to maintain an overall 3.40 grade-point average and a 3.40 grade-point average in major coursework.

2. Students must successfully complete 12 credits of honors coursework in at least two courses (Junior level) and one senior level course offered by the Environmental Engineering Program. Honors courses will involve increased work assignments, i.e., laboratory experiments/analysis, research, design projects, literature review, term papers, lectures of comprehensive examination. Students registering for honors designated coursework must follow the University Honors Program Course Designation Guidelines (http://www.unh.edu/honors-program/designation.html).

3. Students must successfully complete 799H Senior Honors thesis (4 cr. total during senior year; 3 credits of which may be used to fulfill an ENE non-design elective). An individual project must be completed under faculty guidance resulting in a written thesis which is to be submitted by the end of the second semester of senior year.

Contact: Environmental Engineering MP Students: Nancy Kinner – 603-862-1422
10. Five Year BS/MS Option

Students can earn an MS in Civil Engineering in one year of academic work beyond obtaining their BS ENE MP degree. [Note: UNH does not offer an MS or PhD program in Environmental Engineering.] Our Non-Thesis MS program requires 31 credits of coursework which can be completed in two semesters of full-time academic work. Thus, a student can complete and receive both the BS and the MS in five years at UNH.

For more information about this program, see your academic advisor.

11. Early Graduate Admission Program

Here at UNH, students have the additional benefit of being able to apply for Early Admission with the UNH Graduate School (http://www.gradschool.unh.edu/index.php). Students who do so can “double count” two courses for up to eight graduate credits. (These two courses count for both the BS and the MS.) Early admission is restricted to UNH seniors only, is typically in place for the spring semester of their senior undergraduate year, and requires a 3.50 cumulative GPA.

For more information about this program, see your academic advisor.
C. ENE MP Faculty

1. Faculty Contact Information

<table>
<thead>
<tr>
<th>NAME</th>
<th>OFFICE</th>
<th>TELEPHONE</th>
<th>FAX</th>
<th>EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Thomas Ballestero</td>
<td>Gregg Hall 238</td>
<td>603-862-1405</td>
<td>603-862-3957</td>
<td><a href="mailto:tom.ballestero@unh.edu">tom.ballestero@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Robin Collins</td>
<td>Kingsbury Hall W183A</td>
<td>603-862-1407</td>
<td>603-862-2364</td>
<td><a href="mailto:robin.collins@unh.edu">robin.collins@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Kevin Gardner</td>
<td>Gregg Hall 336</td>
<td>603-862-4334</td>
<td>603-862-3957</td>
<td><a href="mailto:kevin.gardner@unh.edu">kevin.gardner@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Jennifer Jacobs</td>
<td>Gregg Hall 240</td>
<td>603-862-0635</td>
<td>603-862-3957</td>
<td><a href="mailto:jennifer.jacobs@unh.edu">jennifer.jacobs@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Nancy Kinner</td>
<td>Gregg Hall 236</td>
<td>603-862-1422</td>
<td>603-862-3957</td>
<td><a href="mailto:nancy.kinner@unh.edu">nancy.kinner@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Paul Kirshen</td>
<td>Gregg Hall 248</td>
<td>603-862-4637</td>
<td>603-862-3957</td>
<td><a href="mailto:paul.kirshen@unh.edu">paul.kirshen@unh.edu</a></td>
</tr>
<tr>
<td>Dr. James Malley</td>
<td>Gregg Hall 344</td>
<td>603-862-1449</td>
<td>603-862-3957</td>
<td><a href="mailto:jim.malley@unh.edu">jim.malley@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Weiwei Mo</td>
<td>Gregg Hall 334</td>
<td>603-862-2808</td>
<td>603-862-3957</td>
<td><a href="mailto:Weiwei.mo@unh.edu">Weiwei.mo@unh.edu</a></td>
</tr>
<tr>
<td>Dr. Alison Watts</td>
<td>Gregg Hall 222</td>
<td>603-862-0585</td>
<td>603-862-3957</td>
<td><a href="mailto:alison.watts@unh.edu">alison.watts@unh.edu</a></td>
</tr>
</tbody>
</table>
Dr. Thomas P. Ballestero, an Associate Professor of Civil/Environmental Engineering, is a hydrologist and water resources engineer. He received his B.S. (1975) and M.S. (1977) in Civil Engineering from Penn State, and a Ph.D. (1981) in Hydrology and Water Resources Engineering from Colorado State. At Penn State, in-between M.S. and Ph.D. degrees, Dr. Ballestero taught water resources courses and professional short courses on computer simulation. From 1979 – 1983, he was the manager of the water resources engineering division of Simons, Li and Associates, Inc. In this capacity, Dr. Ballestero was project manager for projects dealing with water resources development (ground water and surface water supplies), hydropower feasibility analyses, hydrologic analysis and simulation, evaluation of contaminant migration, water rights, and design and evaluation of water monitoring networks. Also, Dr. Ballestero was involved with proposals, corporate marketing, expert witness testimony and corporate management. In 1983, Dr. Ballestero entered his present appointment at UNH where he teaches eleven different courses in hydrology and water resources. His research interests are broadly in the field of water resources computer simulation and field measurement of parameters in surface and ground water systems. Dr. Ballestero has strong research and consulting lines in stream restoration and stormwater management. In 2002 he started the UNH Stormwater Center. Since 2005, he has held a joint position with the US Fish & Wildlife Service performing all aspects of stream restoration. He is one of the founding members of the Environmental Research Group (ERG), he chaired the Civil Engineering Department from 1993 – 1999, and he was director of the New Hampshire Water Resources Research Center from 1986 to 1999. Dr. Ballestero holds professional licensures of: PE, PH, PG, and CGWP.

Dr. M. Robin Collins, P.E., is a Professor of Civil/Environmental Engineering and is currently the Davison Professor of Environmental Engineering and Chair of the Department of Civil Engineering. He completed a B.S.C.E with distinction (1970) and an M.S. in Sanitary Engineering (1972) from Virginia Polytechnic Institute and State University, and a Ph.D. from the University of Arizona (1985). Dr. Collins is a registered professional civil and environmental engineer and is currently the Director of the USEPA-funded New England Water Treatment Technology Assistance Center. He was one of the founding members of the Environmental Research Group (1987) at the University of New Hampshire. Dr. Collins has expertise in water treatment design and operations and on-site wastewater disposal systems. He has extensive professional experience working with municipalities as an engineering consultant, a district engineer for state regulatory (KS and WY) agencies, and as a Sanitary Engineer for the U.S. Army. He has successfully conducted research in cooperation with numerous water utilities and funding agencies by characterizing natural organic matter and disinfection by-product precursor and microbial removals from selected water treatment processes including slow sand filtration, diatomaceous earth filtration, membrane filtration, riverbank filtration and conventional chemical clarification treatment. He has worked with numerous public water suppliers and consulting engineers nationwide in evaluating and piloting several filtration options, especially slow sand filtration. His research efforts have been honored by the AWWA by serving as the major advisor to the 1990, 1993, 1998, and 2005 recipients of the Academic Achievement Award for Best Thesis. Dr. Collins teaches courses on water chemistry, environmental pollution and control, public health engineering and physical-chemical treatment processes.
**Dr. Kevin H. Gardner** is a registered professional environmental engineer and a Professor of Civil and Environmental Engineering. He is currently a Faculty Fellow in the Office of the Senior Vice Provost for Research. Dr. Gardner received his B.S. in Civil Engineering from Union College in 1989 and his M.S. and Ph.D. from Clarkson University in Environmental Engineering in 1992 and 1996, respectively. Dr. Gardner teaches courses related to Sustainable Engineering and Life Cycle Assessment. Dr. Gardner’s research focus includes evaluation of sustainability, life cycle assessment, social factors of sustainability, behavior of contaminants in aquatic environments, and remediation of contaminated sediments.

**Dr. Jennifer M. Jacobs** received her Sc.B from Brown University in 1987, her M.S. from Tufts University in 1993, and her Ph.D. from Cornell University in 1997. Dr. Jacobs has been a faculty member at UNH since 2003. Dr. Jacobs was a faculty member at the University of Florida from 1997 to 2003. She was also a consultant for the Boston Systems Group and Eastern Research Group from 1987 to 1993. Dr. Jacobs is a water resources engineer and Professor of Civil/Environmental Engineering. She is advancing interdisciplinary research at the margins of environmental engineering, social sciences and physical sciences. A key focus is advancing technologies which can improve the quality of life and environment. As a full-time member of the faculty, Dr. Jacobs teaches undergraduate and graduate courses in fluid mechanics, water resources, and surface water hydrology. Dr. Jacobs conducts experimental research in snow hydrology, watershed hydrology, land-surface and water energy dynamics with an emphasis on the application of emerging technologies to current research needs. Currently, Dr. Jacobs’ students are investigating mechanisms of snowmelt driven flooding as well as stream temperature variations and impacts to aquatic habitat. Increasingly, their work is informed by climate and land use changes that are forcing existing hydrologic analysis frameworks to be reconsidered.

**Dr. Paul Kirshen** has 30 years of experience serving as Principal Investigator of complex, interdisciplinary, participatory research related to water resources and coastal zone management, and climate variability and change. He is presently Research Professor, Environmental Research Group of Department of Civil Engineering, and Institute for the Study of Earth, Oceans, and Space, University of New Hampshire, Durham, NH. Previously he served as Climate Change Adaptation Research Leader at Battelle Memorial Institute. From 1996 to 2009, he was Research Professor, Civil and Environmental Engineering Department, Tufts University and Director and Co-founder of the Water: Systems, Science, and Society (WSSS) Interdisciplinary Graduate Education Program. He is a Lead Author for the 2014 Fifth Intergovernmental Panel on Climate Change (IPCC) Assessment (Working Group 2) and the 2013 US National Climate Assessment. He was Principal Investigator (PI) of a $900,000 US EPA grant to investigate the integrated impacts of climate change on metro Boston and to develop recommendations for adaptation actions (CLIMB Project, 1999-2004); leader of the team investigating climate change coastal flooding impacts in the Northeastern US for the Union of Concerned Scientists (2005-2008); PI of a project
to develop guidance tools for planning and management of urban drainage systems under a changing climate for US NOAA with

Somerville MA as one of the case studies (2008 to 2011); Co-PI of a US NOAA grant to investigate the impacts of increased coastal flooding in East Boston MA and eastern shore of Maryland with particular emphasis on vulnerable populations and adaptation options (2009 to present); part of teams conducting a national vulnerability assessment of US Army Corps of Engineers projects and programs (2010 to Present), co-PI of US EPA project to investigate municipal adaptation options to SLR in several New England municipalities (2008 to present); PI of a US NOAA grant to develop an integrated adaptation strategy for Exeter NH (2012 to 2014). He also is working for various clients to support adaptation planning in Boston and Cambridge MA. He has much international experience; most recently working with farmers and irrigators in West Africa on the use of seasonal climate forecasts to improve their livelihoods (NOAA-funded CFAR project, 1999 to present). He has also consulted with the World Bank and the UNDP on global water management.

He has over 50 published journal articles on these topics as well as many book chapters and reports. He received his ScB in Engineering from Brown University and his MS and PhD in Civil Engineering from MIT.

Dr. Nancy E. Kinner is a University Professor, an environmental engineering microbiologist and Professor of Civil/Environmental Engineering. Dr. Kinner is a member of the Environmental Research Group (ERG) at UNH and has conducted research on the role of protists in contaminant degradation, and petroleum and chlorinated solvent bioremediation. Dr. Kinner teaches courses on the fundamentals of environmental engineering, environmental engineering microbiology, environmental sampling and analysis, and marine pollution and control. She also studies bioremediation of contaminated bedrock aquifers. Dr. Kinner is the UNH Co-Director of the UNH Coastal Response Research Center funded by NOAA’s Office of Response and Restoration. The Center funds research on oil spill response, restoration, and recovery and has been involved in R&D issues related to the drilling in the Arctic and the Deepwater Horizon spill in the Gulf of Mexico.

Dr. James P. Malley, Jr., is a Professor of Civil/Environmental Engineering. He has a B.S.E.S. (1980) from Rutgers University; and a B.S.C.E. (1988), M.S. (1984), and Ph.D. (1988) in Environmental Engineering from the University of Massachusetts. Dr. Malley teaches classes in water reuse, solid and hazardous waste engineering and life cycle assessment for sustainability. Dr. Malley is committed to involving students at all levels (from rising first year students to graduate students in his research and scholarship activities). If you are interested in undergraduate research opportunities, ask about the MalleyCATS.
Dr. Malley has been active in the environmental engineering field for over 30 years and has served as a principal advisor on 75 Drinking Water projects in 9 countries involving bench, pilot, demonstration and full-scale testing that range in size from 0.14 to 2,600 million gallons per day. Dr. Malley is committed to providing safe drinking water to people in developing nations around the world through groups such as Water for People and Engineers without Borders. He has conducted millions of dollars in research and has published over 100 papers and technical reports including being a principal author of the 2006 UV Disinfection Guidance Manual for USEPA which is the industry gold standard for UV validation. Dr. Malley served as Chairman of the Board of Trustees for the Water Quality and Technology Division of AWWA (2007-2010) and is currently Vice-Chairman of the AWWA Technical and Education Council. Dr. Malley received the 2013 UNH Award for Outstanding Public Service. Years of experience and hundreds of professional contacts allow Dr. Malley to help students become part of the engineering profession and obtain internship and job offers.

**Dr. Weiwei Mo** is a starting faculty member in the Department of Civil Engineering. She got her BS degree from Shanghai Jiao Tong University in China, and her MS and PhD degrees from University of South Florida. Before coming to UNH, she was a post-doctoral associate at Yale University. Her research interests include life cycle assessment and systems analysis of technologies and infrastructures, water-energy-climate nexus through environmental, economic, and social analyses, integrated resource recovery (energy, nutrients, water) in WWTPs, and water reclamation. She is going to teach a class named “Systems Analysis of the Environment” in the Fall Semester, and a life cycle assessment class in the Spring.

**Dr. Alison W. Watts** received a B.A. from Mt. Holyoke College (1984), an M.S. in Geology from Arizona State University (1992), and a Ph.D. in Civil Engineering from the University of New Hampshire (2006). She joined the Civil Engineering Department in 2009 as a Research Assistant Professor of Civil Engineering. Dr. Watts works with the UNH Stormwater Center, and her research includes a study of polycyclic aromatic hydrocarbon (PAH) transport in storm water runoff, research on the movement and transformation of PAHs, focusing on transport in wetland plants, and wetland systems; nutrient removal mechanisms; statistical analysis of hydrologic data; ecological assessment of stormwater wetlands, and the use of stormwater wetlands to treat deicing runoff from airports. Dr. Watts has experience in groundwater studies, and wetlands mapping, as well as course work in hydrology, wetlands ecology, environmental microbiology, and geostatistics. She is involved in natural resource and wetlands conservation in her local community, and is chair of the Newfields Conservation Commission. Dr. Watts is a NH Professional Geologist, and has over ten years of experience as a consultant in contaminant investigations, site assessment and remediation. Contact Information: alison.watts@unh.edu, 603-862-0585.
Code of Ethics for Engineers

Preamble
Engineering is an important and learned profession. As members of this profession, engineers are expected to exhibit the highest standards of honesty and integrity. Engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness, and equity, and must be dedicated to the protection of the public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

I. Fundamental Canons
Engineers, in the fulfillment of their professional duties, shall:
1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.

II. Rules of Practice
1. Engineers shall hold paramount the safety, health, and welfare of the public.
   a. If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.
   b. Engineers shall approve only those engineering documents that are in conformity with applicable standards.
   c. Engineers shall not reveal facts, data, or information without the prior consent of the client or employer except as authorized or required by law or this Code.
   d. Engineers shall not permit the use of their name or associate in business ventures with any person or firm that they believe is engaged in fraudulent, dishonest, or dishonest enterprise.
   e. Engineers shall not aid or abet the unlawful practice of engineering by a person or firm.
   f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities, and cooperate with the proper authorities in furnishing such information or assistance as may be required.
2. Engineers shall perform services only in the areas of their competence.
   a. Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.
   b. Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.
   c. Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering documents for the entire project, provided that such technical segment is designed and sealed only by the qualified engineers who prepared the segment.
3. Engineers shall issue public statements only in an objective and truthful manner.
   a. Engineers shall be objective and truthful in professional reports, statements, or testimony. They shall include all relevant and pertinent information in such reports, statements, or testimony, which should bear the date indicating when it was current.
   b. Engineers may express publicly technical opinions that are founded upon knowledge of the facts and competence in the subject matter.
   c. Engineers shall issue no statements, criticisms, or arguments on technical matters that are inspired or paid for by interested parties, unless they have prefaced their comments by explicitly identifying the interested parties on whose behalf they are speaking, and by revealing the existence of any interest the engineers may have in the matters.
4. Engineers shall act for each employer or client as faithful agents or trustees.
   a. Engineers shall disclose all known or potential conflicts of interest that could influence or appear to influence their judgment or the quality of their services.
   b. Engineers shall not accept compensation, financial or otherwise, from more than one party for services on the same project, or for services pertaining to themselves or others.
   c. Engineers shall not solicit or accept financial or other valuable consideration, directly or indirectly, from outside agents in connection with the work for which they are responsible.
   d. Engineers in public service as members, advisors, or employees of a governmental or quasi-governmental body or department shall not participate in decisions themselves or others.
   e. Engineers shall not solicit or accept a contract from a governmental body on which a principal or officer of their organization serves as a member.
5. Engineers shall avoid deceptive acts.
   a. Engineers shall not falsely market their qualifications or permit misrepresentation of their qualifications or the qualifications of others.
   b. Engineers shall not misrepresent or exaggerate their responsibility in or for the subject matter of their assignments.
   c. Engineers shall not offer, give, solicit, or receive, directly or indirectly, any contribution to influence the award of a contract by public authority, or which may be reasonably construed by the public as having the effect or intent of influencing the awarding of contracts. They shall not offer any gift or other valuable consideration in order to secure work. They shall not pay a commission, percentage, or brokerage fees in order to secure work, except to a bona fide employee or bona fide established commercial or marketing agency retained by them.

III. Professional Obligations
1. Engineers shall be guided in all their relations by the highest standards of honesty and integrity.
   a. Engineers shall acknowledge their errors and shall not distort or alter the facts.
   b. Engineers shall advise their clients or employers when they believe a project will not be successful.
   c. Engineers shall not accept outside employment to the detriment of their regular work or interest. Before accepting any outside engineering employment, they will notify their employers.
   d. Engineers shall not attempt to attract an engineer from another employer by false or misleading pretenses.
   e. Engineers shall not promote their own interest at the expense of the dignity and integrity of the profession.
2. Engineers shall at all times strive to serve the public interest.
   a. Engineers are encouraged to participate in civic affairs, career guidance for youth, and work for the advancement of the safety, health, and well-being of their community.
   b. Engineers shall not complete, sign, or seal plans and specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.
   c. Engineers are encouraged to extend public knowledge and appreciation of engineering and its achievements.
   d. Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations.
3. Engineers shall avoid all conduct or practice that deceives the public.
   a. Engineers shall avoid the use of statements containing a material
      misrepresentation of fact or omitting a material fact.
   b. Consistent with the foregoing, engineers may advertise for
      recruitment of personnel.
   c. Consistent with the foregoing, engineers may prepare articles for
      the lay or technical press, but such articles shall not imply credit
to the engineer for work performed by others.

4. Engineers shall disclose, without consent, confidential information
   concerning the business affairs or technical processes of any present
   or former client or employer, or public body on which they serve.
   a. Engineers shall not, without the consent of all interested parties, promote
      or arrange for new employment or practice in connection with
      a specific project for which the engineer has gained particular
      and specialized knowledge.
   b. Engineers shall not, without the consent of all interested parties, participate
      in or represent an adversary interest in connection with a specific
      project or proceeding in which the engineer has gained particular
      specialized knowledge on behalf of a former client or employer.

5. Engineers shall not be influenced in their professional duties by
   conflicting interests.
   a. Engineers shall not accept financial or other considerations;
      including free engineering designs, from material or equipment
      suppliers for specifying their product.
   b. Engineers shall not accept commissions or allowances, directly or
      indirectly, from contractors or other parties dealing with clients or
      employers of the engineer in connection with work for which the
      engineer is responsible.

6. Engineers shall not attempt to obtain employment or advancement or
   professional engagements by unethically criticizing other engineers
   or by other improper or questionable methods.
   a. Engineers shall not request, propose, or accept a commission on a
      noncompete basis under circumstances in which their judgment
      may be compromised.
   b. Engineers in salaried positions shall accept part-time engineering
      work only to the extent consistent with policies of the employer and
      in accordance with ethical considerations.
   c. Engineers shall not, without consent, use equipment, supplies,
      laboratory, or office facilities of an employer to carry on outside
      private practice.

7. Engineers shall not attempt to injure, maliciously or falsely, directly
   or indirectly, the professional reputation, prospects, practices, or
   employment of other engineers. Engineers who believe others are
   guilty of unethical or illegal practice shall present such information
   to the proper authority for action.
   a. Engineers in private practice shall not review the work of another
      engineer for the same client, except with the knowledge of such
      engineer, or unless the connection of such engineer with the work
      has been terminated.
   b. Engineers in governmental, industrial, or educational employ are
      entitled to review and evaluate the work of other engineers when so
      required by their employment duties.
   c. Engineers in sales or industrial employ are entitled to make
      engineering comparisons of represented products with products of
      other suppliers.

8. Engineers shall accept personal responsibility for their professional
   activities, provided, however, that engineers may seek indemnification
   for services arising out of their practice for other than gross
   negligence, where the engineer's interests cannot otherwise be
   protected.
   a. Engineers shall conform with state registration laws in the practice
      of engineering.
   b. Engineers shall not use association with a nonengineer, a
corporation, or partnership as a "cloak" for unethical acts.

9. Engineers shall give credit for engineering work to those to whom
   credit is due, and will recognize the proprietary interests of others.
   a. Engineers shall, whenever possible, name the person or persons
      who may be individually responsible for designs, inventions,
      writings, or other accomplishments.
   b. Engineers using designs supplied by a client recognize that the
      designs remain the property of the client and may not be duplicated
      by the engineer for others without express permission.
   c. Engineers, before undertaking work for others in connection with
      which the engineer may make improvements, plans, designs,
      inventions, or other records that may justify copyrights or patents,
      should enter into a positive agreement regarding ownership.
   d. Engineers' designs, data, records, and notes referring exclusively to
      an employer's work are the employer's property. The employer
      should indemnify the engineer for the use of the information for any
      purpose other than the original purpose.
   e. Engineers shall continue their professional development throughout
      their careers and should keep current in their specialty fields by
      engaging in professional practice, participating in continuing
      education courses, reading in the technical literature, and attending
      professional meetings and seminars.

Footnote 1: "Sustainable development" is the challenge of meeting human
needs for natural resources, industrial products, energy, food,
transportation, shelter, and effective waste management while
conserving and protecting environmental quality and the natural
resource base essential for future development.

As Revised July 2007

"By order of the United States District Court for the District of Columbia,
former Section 11(c) of the NSPE Code of Ethics prohibiting competitive
bidding, and all policy statements, opinions, rulings or other guidelines
interpreting its scope, have been rescinded to unlawfully interfering with
the legal right of engineers, protected under the antitrust laws, to provide
price information to prospective clients; accordingly, nothing contained in the
NSPE Code of Ethics, policy statements, opinions, rulings or other guidelines
prohibits the submission of price quotations or competitive bids for engineering
services at any time or in any amount."

Statement by NSPE Executive Committee

In order to correct misunderstandings which have been indicated in some
instances since the issuance of the Supreme Court decision and the entry of the
Final Judgment, it is noted that in its decision of April 25, 1978, the Supreme
Court of the United States declared: "The Sherman Act does not require
competitive bidding."

It is further noted that as made clear in the Supreme Court decision:
1. Engineers and firms may individually refuse to bid for engineering services.
2. Clients are not required to seek bids for engineering services.
3. Federal, state, and local laws governing procedures to procure engineering
   services are not affected, and remain in full force and effect.
4. State societies and local chapters are free to actively and aggressively seek
   legislation for professional selection and negotiation procedures by public
   agencies.
5. State registration boards of professional conduct, including rules
   prohibiting competitive bidding for engineering services, are not affected and
   remain in full force and effect. State registration boards with authority to
   adopt rules of professional conduct may adopt rules governing procedures to
   obtain engineering services.
6. As noted by the Supreme Court, "nothing in the judgment prevents NSPE and
   its members from attempting to influence governmental action . . ."
2. UNH Academic Honesty Policy

09 Academic Honesty (From Section 9 of the UNH Rights and Responsibilities Handbook)

Honesty is a core value at the University of New Hampshire. The members of its academic community both require and expect one another to conduct themselves with integrity. This means that each member will adhere to the principles and rules of the University and pursue academic work in a straightforward and truthful manner, free from deception or fraud.

Any attempts to deviate from these principles will be construed as acts of academic dishonesty and will be dealt with according to the rules of due process outlined below.

The value of honesty and the expectation of conduct that goes with it are intended to reinforce a learning environment where students and faculty can pursue independent work without unnecessary restraints. At the same time, the University recognizes its responsibility to encourage and inculcate values and standards of conduct that will guide its students throughout their careers.

The academic honesty policy provides standards of conduct for individuals only. Policies relating to recognized student organizations are described elsewhere. Such organizations, however, are expected to conform to the values and standards that govern their members as individuals within the UNH community. It is expected that students attending the University will conduct themselves in accordance with the rules and regulations of the University. Students must acknowledge the University's right to take disciplinary action, including suspension or dismissal, for failure to comply with the expectations delineated by this policy.

This policy establishes the expectations of the University of New Hampshire for academic honesty and defines situations that constitute academic misconduct. Finally, it presents the due process that follows should misconduct occur.

While it is impossible to list all cases that might arise, the following are provided as examples of academic dishonesty.

09.1 Written Classroom Examinations

Presenting the work of other students as one's own, or assisting another student to do so, in a written classroom examination is considered to be cheating. Cheating may also occur when a student violates the conditions governing the examination.

Examples include, but are not limited to the following:

1. using oral, written, visual, or other form of communication intended to give or receive improper assistance;
2. looking at or copying another's work;
3. using unauthorized materials (texts, notes, etc.);
4. having a surrogate take an exam;
5. altering your work after an exam has been returned and before resubmitting it;
6. obtaining and/or using an upcoming exam ahead of time.

09.2 Out-of-Class Work

Collaboration or aid on out-of-class work, when prohibited by the instructor, is considered to be cheating. Such unauthorized activity includes, but is not limited to the following:

1. receiving outside help on take home exams;
2. consulting with others about homework, laboratory reports, etc.;
3. copying another's homework, laboratory reports, etc., and submitting them as your own.

09.3 Plagiarism

The unattributed use of the ideas, evidence, or words of another person, or the conveying of the false impression that the arguments and writing in a paper are the student's own. Plagiarism includes, but is not limited to the following:

1. the acquisition by purchase or otherwise of a part or the whole of a piece of work which is represented as the student's own;
2. the representation of the ideas, data, or writing of another person as the student's own work, even though some wording, methods of citation, or arrangement of evidence, ideas, or arguments have been altered;
3. concealment of the true sources of information, ideas, or argument in any piece of work.

09.4 Misrepresentation

The deliberate falsification of information substituted in place of the truth is misrepresentation and includes but is not limited to the following:

1. having another person represent or stand in for oneself in circumstances where the student's attendance and/or performance is required;
2. leaving a class, laboratory, etc. without permission but after attendance has been taken;
3. presenting false academic credentials;
4. having another person author one's written work;
5. submitting work originally submitted for one course to satisfy the requirements of another course, without prior consent of the current instructor (it is assumed that the current instructor expects the work to be original);
6. forging or using another's signature;
7. altering or destroying academic records and documents;
8. presenting false data, experimental results, or physical results.

09.5 Academic Policy

Violations of academic policy that are considered as academic dishonesty include but are not limited to the following:

1. removing materials from the library with out proper authority;
2. infringing on the rights of other students to fair and equal access to academic resources;
3. duplicating course materials expressly forbidden by the instructor;
4. ignoring or willfully violating class or laboratory instructions or policies.

09.6 Computers

Violations of computer codes of ethics distributed at the University will be considered academic dishonesty.

09.7 Procedures for Dealing with Academic Misconduct

A student shall be informed of any accusation of academic misconduct. The procedure for handling such cases shall be as follows:

1. Individual cases will be handled initially by the instructor of the course concerned, as required by the instructor's professional responsibility to assess the performance of his or her students. The instructor will notify the student of the alleged infraction and what course of action and penalty the instructor believes is appropriate. The student must be allowed an opportunity to rebut the allegation. The initial notification and conference are to be conducted informally. The chair of the department offering the course should be apprised on any actions taken. The penalty imposed by the instructor may not exceed failure in the course, in which case the student should be informed in writing that a failing grade is being assigned for academic misconduct and that further appropriate action may be taken by the student's college dean. Cases shall be reported to the student's college dean at the discretion of the instructor and department chair, except when a failing grade in the course is assigned for academic misconduct, in which case the student's college dean shall be notified of that fact.

2. Cases involving academic misconduct by students not enrolled in the course in question will be referred to the student's college dean, in which case the procedures detailed in section (1) above will be followed.

3. The student's college dean, when informed of an academic misconduct case as in (1) or (2) may take appropriate further action including suspension or dismissal; however, such action shall not take place before the student has been advised by the dean or his/her representative in writing in a timely fashion (normally before the semester succeeding the precipitating infraction) of the charges, and not before the student has been given an opportunity to explain or reply to the charges.

4. Any student penalized under those procedures may appeal the decision. In any appeal, the student involved has the right to the presence of an advisor of the student's choice drawn from the University community.

A. to appeal an instructor's decision, a written request for appeal must be sent to the student's college dean in a timely fashion, normally within 30 days, unless the student presents evidence of circumstances preventing such a timely response. Normally within two weeks the dean will schedule a meeting with the student to afford the student an opportunity to explain or reply to the charges. A dean's appellate decision can be appealed further to the Academic Standards and Advising Committee, which will consider the appeal only on the basis of procedural irregularities. Any new data or evidence that becomes available will return the case to the student's college dean.

B. In cases where the student's college dean is the primary respondent, or in cases where the student's college dean imposes a significant further penalty beyond that imposed by the course instructor, appeals of the dean's decision must be made in writing and in a
timely fashion (as defined in 4 A.) directly to the Academic Standards and Advising Committee. The chair of that committee will respond normally within two weeks by scheduling a hearing to afford the student an opportunity to explain or reply to the charges. In such a case that committee will hear substantive as well as procedural complaints. In any such case the representative of the student's college dean to the Academic Standards and Advising Committee will be excused from the committee's deliberations.

*As approved by the Faculty Senate February 25, 1991*

**09.8 Reporting**

It shall be the responsibility of the student's college dean to report to the Academic Standards and Advising Committee all actions and all appeals from students resulting from cheating cases.

Note: Cases involving graduate students are referred to the Associate Dean of the Graduate School. Appeals of the Associate Dean's decision can be made to the Dean of the Graduate School who may, at his/her discretion, refer the case to the Graduate Council for review. Students who are dismissed by the Associate Dean and wish to appeal that decision should follow the procedures for graduate students dismissed for academic reasons.
3. ENE MP Student Code of Ethics

ENE Program MP Emphasis
Student Code of Ethics
University of New Hampshire, Durham, NH

I understand that the work of environmental engineers impacts society in a variety of social, economic, and environmental ways and that professional negligence can result in the loss of property, widespread illness, damage to the environment, and the loss of human life. I understand that environmental engineering practice, therefore, requires high ethical standards that hold paramount the safety health, and welfare of the public. By signing below, I pledge the following:

- I commit myself to be honest and to honor and respect the rights of others.
- I will not plagiarize, cheat on exams, assist others in doing so, or tolerate such behavior in others.
- I have received and read the National Society of Professional Engineers (NSPE) Code of Ethics for Engineers. I understand what is written therein, and pledge to uphold this Code of Ethics both as a student and as a practicing engineer.
- I have received and read Section 9 on Academic Honesty of the document *Student Rights, Rules, and Responsibilities*, of the University of New Hampshire and will pursue my academic work at UNH in a straightforward and truthful manner, free from deception or fraud. Furthermore, I understand the procedures for dealing with academic misconduct and understand the consequences including the possibility of outright dismissal from UNH.

________________________________
Printed Name

________________________________    __________________
Signature         Date Signed
E. Facilities and Resources

1. Gregg Hall

The ENE MP program is housed in Gregg Hall. Gregg Hall is a four-story, 55,000 square foot building completed in 2001 which sets a new standard in quality environmental educational and research space. It serves as a multidisciplinary science and engineering research building with a focus on environmental technology development and entrepreneurship and includes classrooms, project work space, a computer room, laboratories, instrumentation rooms, constant temperature rooms, high bay areas, faculty, staff and graduate student offices, conference/meeting rooms, and an audio/visual multimedia room for presentations and videoconferencing. ENE MP students have access to many amenities in Gregg Hall, including student lockers, project work space rooms, building-wide wireless networking, kitchens, 8-station computer room, color printers and plotters, and multimedia classrooms, like Gregg 320. One of the most significant attributes of the physical environment is the close relationship enjoyed by undergraduate ENE MP students with ENE graduate students, faculty and staff. Undergraduates have unfettered access to faculty while working on projects or in the laboratories, but also have support and benefit from interaction with the ENE graduate population and professional research staff members associated with the Environmental Research Group. Most ENE courses are taught in Gregg 110, which can seat up to 50 students. Gregg 320 is used for teaching when intensive multimedia capabilities are required and is used for presentations by students, faculty and seminar speakers.

Office and computing facilities in Gregg Hall are excellent. ENE MP students have access to a computer room with eight PC workstations as well as high-speed wireless throughout the building. The new $15,000 wireless network system ensures access in laboratories, classrooms, project work space rooms, meeting rooms, and other areas where ENE MP outcomes are being achieved. Two color laser printers, two black-and-white laser printers, a 48” color plotter, two scanners, a photocopy machine and a FAX machine are all available to ENE MP students in Gregg Hall. In addition, the multimedia room (Gregg 320) offers a PC workstation, a MAC workstation, videoconferencing system, DVD player, two VCR player/recorders, a flatbed documents projector, a slide projector, and touchscreen remote control system. ENE MP students make use of the multimedia room both by receiving specialized instruction, making presentations to classes and constituents, and participating in videoconferences.

Gregg Hall provides the ENE MP students and faculty with exceptional classroom, laboratory, and project work space. The computational infrastructure is superb, with high-speed wireless universally available, PC workstations for class work and project work, and supported by color printers, plotters and presentation hardware. Laboratory facilities and equipment exceed that needed to accomplish ENE MP outcomes, giving students access to a full suite of state-of-the-art, research-quality instrumentation. Proximity of project work space, faculty, staff, and graduate student offices, laboratories, and the primary classroom provides a close-knit learning environment that naturally provides the support students need to accomplish ENE MP outcomes.

Students in the ENE program generally split their time between two buildings: Kingsbury Hall and Gregg Hall. Kingsbury Hall, renovated in 2007, and Gregg Hall, built in 1999, provides our students the environment they need to learn to become the next generation of scientists and engineers. Both buildings have infrastructure conducive to student research, with student lab and high-bay space for projects, as well as appropriate heating, air conditioning and ventilation.
throughout. All classrooms have LCD projectors, including two state-of-the-art lecture halls in Kingsbury to accommodate larger groups. Both buildings have high-speed wireless internet access in all classrooms and labs. Gregg Hall and Kingsbury Hall are a short distance from each other, allowing students easy access to faculty, staff, and graduate students, as well as a plethora of resources, including the engineering library, numerous computer clusters with a wide array of software, and close proximity to common interdisciplinary partners such as the Hubbard Genome Center, and the Chase Ocean Engineering lab, adjacent to Gregg Hall. Laboratories in both buildings are routinely inspected by UNH Office of Environmental Health and Safety to ensure a safe working environment, and many of the faculty and staff that oversee undergraduate and graduate research have advanced safety training, including OSHA 40-hour HAZWOPER training. Kingsbury Hall, open 24 hours per day, contains the popular student coffee shop Albert’s, allowing students to take breaks and obtain refreshments without the need to travel long distances. The program is also within walking distance from the Town of Durham Water Treatment Facility, and a short drive from the wastewater treatment facility, both of which are used extensively for tours, sampling sources, and have been previously used as an experiment site by students.

2. Kingsbury Hall

Civil Engineering Office
The Civil Engineering Office is located in Kingsbury Hall Room W183 and is open from 8:00 a.m. to 12:00 noon, and from 1:00 p.m. to 4:30 p.m., Monday through Friday. The department Administrative Assistant, Michelle Mancini, provides and coordinates a broad range of services for the faculty and students of the Department. Students are encouraged to contact them during office hours about any concerns, questions, or help they may need at 603-862-1428.

Engineering, Mathematics & Computer Science Library
The Engineering, Mathematics & Computer Science library is a branch of the main UNH library. It serves the College of Engineering and Physical Sciences, UNH departments, research units, and those in the community with interests and needs within the areas of computer science, mathematics and statistics, and chemical, civil, mechanical, and electrical and computer engineering. The library includes a collection of 26,000 books, 890 current periodical subscriptions, and thousands of bound journal volumes. The library is located in Kingsbury Hall room S236. For more information please call 603-862-1740 or visit http://www.library.unh.edu/branches/engmathcs.html.
3. **Student Mailboxes**

You should check your mailbox on a regular basis for notices, announcements, and returned assignments. Student mail folders are maintained in the 2nd floor lounge in Gregg Hall. Students may also have a University mailbox on the second floor of the Memorial Union Building. More information about these mailboxes can be found at [http://unhmub.com/mub/granite-square-station-mailroom](http://unhmub.com/mub/granite-square-station-mailroom)

4. **Textbooks**

Students are advised not to buy any textbooks until they are enrolled in their courses. Textbooks cannot be returned for full price if they have been written in. Textbooks can be purchased in a variety of ways, and it is up to each individual. Local bookstores where textbooks can be purchased are: the Durham Book Exchange (36 Main Street) and the UNH Bookstore (2nd Floor of the Memorial Union Building).

5. **Tutoring**

Students who are experiencing academic difficulties can obtain help through a number of tutoring programs.

a) For math courses, the Math Department runs a tutoring program at the Math Center (MaC Center). Here they offer help with calculus courses and students are strongly encouraged to seek help with their homework and to ask questions. The MaC Center is located at the bottom of Christensen Hall and opens the beginning of the second week of classes. Help is available on Monday and Wednesday from 1-9 p.m., on Tuesday and Thursday from 9-5 p.m., on Friday from 1-5 p.m., and on some Sundays 2-5 p.m. For more information, contact the MaC Center at 862-3576 or visit their website: [http://www.math.unh.edu/mac](http://www.math.unh.edu/mac).

b) The Tau Beta Pi honor society also runs a tutoring program which covers many first year/sophomore courses. For more information please contact Professor Mike Carter, faculty advisor, at mike.carter@unh.edu.

c) Tutoring is also available through the Center for Academic Resources (CFAR). For more information please call them at 862-3698 or visit their website: [www.cfar.unh.edu](http://www.cfar.unh.edu)

d) Teaching assistants (TA’s) are available for CIE and ENE core courses. A list of TA’s and their contact information is posted near the student mailboxes.
6. Academic Advising

Each student is assigned an academic advisor who is a faculty member in the department. Students should consult their advisor for registration, and any other academic advice or signatures they may need. Check with the Civil Engineering Office if you do not know who your academic advisor is.

7. Student Organizations

On campus:

American Society of Civil Engineers (ASCE): ASCE provides access to quality information, works to improve the image of Civil Engineers, and provides career resources. Participate locally in the steel bridge and/or concrete canoe competition.

ASCE Student Officers:
President: Priscilla Tengdin pas55@wildcats.unh.edu
Vice President: Joshua Mele jro233@wildcats.unh.edu
Treasurer: Nathaniel Colp nsr25@wildcats.unh.edu
Secretary: Donald Hanson drw47@wildcats.unh.edu
Special Events Coordinator: David Agan dwe34@wildcats.unh.edu
Professional Development Coordinator: Benjamin Brock bri45@wildcats.unh.edu
Fundraising: Russell Fink rpl37@wildcats.unh.edu
Historian: Aboubacar Konate adr63@wildcats.unh.edu
Environmental Liaison: Amy Lebel knt23@wildcats.unh.edu

Faculty Advisor:
Charles Goodspeed
carlie.goodspeed@unh.edu
603-862-1443

UNH-Environmental and Water Resources Institute (EWRI) is a student lead organization established to expose students to a variety of topics and events which promote environmental awareness and sustainability at UNH and beyond! EWRI provides students with opportunities to give back to the community and network with peers, faculty and professionals which could lead to internships and jobs down the road.

UNH-EWRI Student Officers
Kayla Santello President knt23@wildcats.unh.edu
Max Kenney Vice President mnf29@wildcats.unh.edu
Tyler Kane Treasurer teo43@wildcats.unh.edu
Alyssa Aligata Secretary aji689@wildcats.unh.edu
Alexa Mack Marketing & Finance Chair akp45@wildcats.unh.edu
Allison Wood Professional Outreach Chair ark6@wildcats.unh.edu
Katerina Messologitis Professional Outreach Chair knl26@wildcats.unh.edu
Engineers Without Borders (EWB): The mission of Engineers Without Borders-UNH is to encourage, support, and implement environmentally, socially, and economically sustainable technical projects for local and international communities, while developing globally responsible and knowledgeable students. [http://unhewb.org/](http://unhewb.org/). Students Without Borders (SWB) shares the same goals and student body as EWB, but works on separate projects that do not require reporting to a national organization. [http://unhswb.org/](http://unhswb.org/).

Student Officers:
President: Amy Johnson - president.unhewb@gmail.com
Uganda Project Leads: Megan Burke and Paige Balcom - projectlead.unhewb@gmail.com
Peru Project Leads: Jeff Sires- jdl4477@unh.edu and Megan Dalton - meo243@unh.edu

Faculty Advisor: Robin Collins robin.collins@unh.edu
Phone: 603-862-1407

Faculty Project Advisor: Tom Ballestero tpb1@unh.edu
Phone: 603-862-1405

Society of Women Engineers (SWE): The Society of Women Engineers, founded in 1950, is a non-profit educational and service organization. SWE is the driving force that establishes engineering as a highly desirable career aspiration for women. SWE empowers women to succeed and advance in those aspirations and be recognized for their life-changing contributions and achievements as engineers and leaders. [http://www.unh.edu/swe/index2.html](http://www.unh.edu/swe/index2.html).

President - Stephanie Medicke snk27@wildcats.unh.edu
Vice-President – Kim Forance krk55@wildcats.unh.edu
Treasurer – Heather Zukas heu89@wildcats.unh.edu
Secretary – Jordan Farren jmw993@wildcats.unh.edu

Past Officers (still on SWE Officers Board) – Becca Cole rei45@wildcats.unh.edu

Faculty Advisor:
May-Win Thein mthein@cisunix.unh.edu
603-862-1158
Off-campus National Organizations with student memberships:

AWWA (American Water Works Association): International nonprofit scientific and educational society dedicated to the improvement of drinking water quality and supply. 
http://www.awwa.org/

WEF (Water Environment Federation): Trade association focused upon preserving and enhancing the global water environment.
http://www.wef.org/Home

AEESP (Association for Environmental Engineering and Science Professors): The Association of Environmental Engineering and Science Professors (AEESP) is made up of professors in academic programs throughout the world who provide education in the sciences and technologies of environmental protection.

Environmental Engineering Student Forum (EESF): AEESP has organized an Environmental Engineering and Science student forum to serve as an organizational umbrella for environmental students. This forum will allow students to be exposed to a variety of fields and professional organizations of environmental engineering and science. 
http://www.aeesp.org/membership

National Ground Water Association (NGWA): The mission of NGWA is to enhance the skills and credibility of all ground water professionals, develop and exchange industry knowledge and promote the ground water industry and understanding of ground water resources.
http://www.ngwa.org/Member-Center/Membership/Pages/Students.aspx

Solid Waste Association of North America (SWANA): For over 40 years, the Solid Waste Association of North America has been the leading professional association in the solid waste field. Our association serves over 7,200 members throughout North America, and thousands more with conferences, certifications, publications, and technical training courses.

Air and Waste Management Association (AWMA): The Air & Waste Management Association (A&WMA) is a nonprofit, nonpartisan professional organization that provides training, information, and networking opportunities to thousands of environmental professionals in 65 countries.
http://www.awma.org/

8. Blackboard

In addition to Blackboard “Course” sites, CIE and ENE MP students are automatically subscribed to departmental Blackboard “Organization” sites where a variety of information can be found, including directories, announcements, curriculum worksheets, job/internship postings, and scholarship postings. After logging into Blackboard, look for “My Organizations”.
9. Important UNH Resources and Services

**Disability Services for Students:**
Disability Services for Students provides services to students with documented disabilities to ensure that all University activities and programs are accessible. The office also promotes the development of student self-reliance and the personal independence necessary to succeed in a university climate.
http://www.unh.edu/disabilityservices/

**Center for Academic Resources:**
The mission of the Center for Academic Resources is to assist undergraduate students in achieving their academic potential and in maximizing their educational experience at UNH. They teach active learning skills and skills that promote academic effectiveness and critical thinking. They also provide information and referrals to local resources.
http://www.cfar.unh.edu/

**Connors Writing Center:**
The Robert J. Connors Writing Center is committed to supporting the writing of everyone in the University of New Hampshire community. The writing center is a comfortable space to talk with our writing assistants about your writing. If you've got a quick grammar or citation question, you can send them an instant message with AIM. Their screen name is: unhwritingcenter
http://www.unh.edu/writing/

**Undergraduate Research Opportunities Program (UROP):**
Whether through taking a research-intensive course, working in one of the University's many centers or institutes, or teaming up with a favorite professor to pursue a mutual academic interest, the opportunities to become involved in research abound for students of all majors. If you've never had exposure to the research process, how do you get started? Through the Undergraduate Research Opportunities Program (UROP). They have the resources to make research an integral part of your undergraduate experience, during the academic year or the summer, in the United States and around the world.
http://www.unh.edu/undergrad-research/

**International Research Opportunities Program (IROP):**
Surf the website and then begin your research with a visit to the IROP coordinator, who can answer your questions about our program and provide the application materials you will need to pursue an IROP grant.
http://unh.edu/undergrad-research/international-research-opportunities-program-irop

**Counseling Center:**
The Center helps students fully benefit from their time at UNH through individual counseling, group counseling, psychological testing, psychiatry, campus outreach, and consultation to faculty and staff.
http://www.unhcc.unh.edu/
**Environmental Engineering (ENE) Program Website:**  
Visit the environmental engineering program website for more information about ENE programs, people, and current news.  
http://www.unh.edu/environmental-engineering

**Registrar’s Office:**  
The Registrar's Office is responsible for registration and academic record keeping for all students at the University. The office maintains students' permanent records, and produces student schedules, data audits, and grade reports. Graduation staff track students’ progress toward completion of Discovery and University requirements and provide degree audits to students. The office provides official and unofficial transcripts and enrollment verifications for current students and alumni. Visit their website for:  
http://www.unh.edu/registrar/

- Time and room schedules (class schedules by semester)  
- Academic calendar and deadlines  
- Final exam schedules  
- Graduation information  
- Registration information  
- Discovery information  
- Registrar’s Office forms

**Undergraduate Course Catalog:**  
Includes course descriptions for all UNH courses.  
http://www.undergradcat.unh.edu/
## 10. Important UNH Phone Numbers and Web Addresses

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone Number</th>
<th>Web Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center for Academic Resources</td>
<td>862-3698</td>
<td><a href="http://www.cfar.unh.edu">www.cfar.unh.edu</a></td>
</tr>
<tr>
<td>Center for Undergraduate Research</td>
<td>862-4323</td>
<td><a href="http://www.unh.edu/undergrad-research">www.unh.edu/undergrad-research</a></td>
</tr>
<tr>
<td>CEPS Academic Affairs Office</td>
<td>862-1783</td>
<td><a href="http://www.ceps.unh.edu">www.ceps.unh.edu</a></td>
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<tr>
<td>Civil Engineering Department</td>
<td>862-1428</td>
<td><a href="http://www.unh.edu/civil-engineering">www.unh.edu/civil-engineering</a></td>
</tr>
<tr>
<td>UNH Information Technology</td>
<td>862-4242</td>
<td><a href="http://it.unh.edu/">http://it.unh.edu/</a></td>
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<tr>
<td>Connor’s Writing Center</td>
<td>862-3273</td>
<td><a href="http://www.unh.edu/writing/">www.unh.edu/writing/</a></td>
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<tr>
<td>Counseling Center</td>
<td>862-2090</td>
<td><a href="http://www.unhcc.unh.edu">www.unhcc.unh.edu</a></td>
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<tr>
<td>Disability Services for Students</td>
<td>862-2607</td>
<td><a href="http://www.unh.edu/disabilityservices">www.unh.edu/disabilityservices</a></td>
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<tr>
<td>Environmental Engineering Dept.</td>
<td>862-2206</td>
<td><a href="http://www.unh.edu/environmental-engineering/">www.unh.edu/environmental-engineering/</a></td>
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<td>Environmental Research Group</td>
<td>862-2206</td>
<td><a href="http://www.unh.edu/erg/">www.unh.edu/erg/</a></td>
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<tr>
<td>Health Services</td>
<td>862-1530</td>
<td><a href="http://www.unh.edu/health-services">www.unh.edu/health-services</a></td>
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<tr>
<td>Honors Program</td>
<td>862-3928</td>
<td><a href="http://www.unh.edu/honors-program">www.unh.edu/honors-program</a></td>
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<tr>
<td>International Research Opportunities Program (IROP)</td>
<td>862-4323</td>
<td><a href="http://unh.edu/undergrad-research/international-research-opportunities-program-irop">http://unh.edu/undergrad-research/international-research-opportunities-program-irop</a></td>
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<td>Libraries</td>
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<td><a href="http://www.library.unh.edu">www.library.unh.edu</a></td>
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<tr>
<td>Main (Diamond)</td>
<td>862-1535</td>
<td></td>
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<tr>
<td>CEPS (Kingsbury)</td>
<td>862-1196</td>
<td></td>
</tr>
<tr>
<td>MUB (Memorial Union Bldg) Information Center</td>
<td>862-2600</td>
<td><a href="http://www.unhmub.com/">www.unhmub.com/</a></td>
</tr>
<tr>
<td>Registrar’s Office</td>
<td>862-1500</td>
<td><a href="http://www.unh.edu/registrar">www.unh.edu/registrar</a></td>
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<tr>
<td>SHARPP (Sexual Harassment &amp; Rape Prevention Program)</td>
<td>862-3494</td>
<td><a href="http://www.unh.edu/sharpp">www.unh.edu/sharpp</a></td>
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<tr>
<td>Student Senate</td>
<td>862-1494</td>
<td><a href="http://www.unh.edu/student-senate">www.unh.edu/student-senate</a></td>
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<tr>
<td>Telecom</td>
<td>862-1030</td>
<td><a href="http://www.cis.unh.edu">www.cis.unh.edu</a></td>
</tr>
<tr>
<td>University Advising and Career Services</td>
<td>862-2064</td>
<td><a href="http://www.unh.edu/uacc">www.unh.edu/uacc</a></td>
</tr>
<tr>
<td>Undergraduate Research Opportunities Program (UROP)</td>
<td>862-4323</td>
<td><a href="http://www.unh.edu/undergrad-research/">http://www.unh.edu/undergrad-research/</a></td>
</tr>
<tr>
<td>University Police/Security/Escort Services</td>
<td>862-1427</td>
<td><a href="http://www.unh.edu/upd">www.unh.edu/upd</a></td>
</tr>
</tbody>
</table>

Emergency Dial 911
F. Environmental Research Group (ERG)

1. Overview

The Environmental Research Group specializes in nine areas, each an important issue to New Hampshire and New England communities and private sector firms as well as to the nation. Research is undertaken on other issues when expertise is sought by New Hampshire communities of firms, but it is in these eight areas that the Group has a critical mass of talent, demonstrated significant expertise, and concentrated its program development efforts.

- Bioremediation
- Coastal Response
- Center for Spills in the Environment
- Contaminant Fate, Transport, and Remediation
- Drinking Water Treatment Technologies
- Electrotechnologies Research
- Recycled Materials and Waste Utilization
- Stormwater and Wastewater Treatment
- Stream and Wetland Restoration

Bioremediation
ERG’s groundwater processes and bioremediation research addresses national problems resulting from hazardous waste disposal at military bases, industrial sites, and landfills. The Bedrock Bioremediation Center specializes in multidisciplinary research that focuses on development, testing and evaluation of innovative technologies to enhance in situ biodegradation of organic-contaminants in bedrock aquifers. The Center is funded by the U.S. EPA and directed by Dr. Nancy Kinner (603.862.1422, nancy.kinner@unh.edu).

Center for Spills in the Environment
The Center for Spills in the Environment (CSE), created in 2004 in conjunction with its affiliate Coastal Response Research Center (CRRC) focuses on issues related to hydrocarbon spills. The Center is known for its independence an excellence in the areas of environmental and marine science and engineering as they relate to spills. CSE has conducted numerous workshops bringing together researchers, practitioners and NGOs of diverse backgrounds to address issues in spill response, restoration and recovery. The Center is directed by Dr. Nancy Kinner (603.862.1422, nancy.kinner@unh.edu).

Coastal Response
The Coastal Response Research Center focuses on developing new approaches to spill response and restoration in marine and estuarine environments through research and synthesis of information. A partnership between the National Oceanic Atmosphere Administration (NOAA) and the University of New Hampshire, the Center stimulates innovation in spill preparedness, responses, assessment, and implementation of optimum spill recovery strategies. The Center is directed by Dr. Nancy Kinner (603.862.1422, nancy.kinner@unh.edu).

Contaminant Fate, Transport, and Remediation
The UNH Contaminated Sediment Center was developed in response to regional and national needs to characterize, treat, and manage contaminated dredged materials from ports, harbors, and waterways. The Center is directed by Dr. Kevin Gardner (603.862.4554, kevin.gardner@unh.edu).

Drinking Water Treatment Technologies
The New England Water Treatment Technology Assistance Center is a hub for water treatment. Group efforts in advanced water treatment technology focus on the need of small communities and firms for reliable, affordable systems for drinking water. Concern for safer drinking water, as well as new Federal requirements, are forcing
communities to upgrade to more advanced treatment methods. Technologies that are currently available will result in massive cost increases, so new technologies are urgently needed. The Center is funded by the U.S. EPA. Dr. Robin Collins (603.862.1407; robin.collins@unh.edu) directs the Center.

Electrotechnologies Research
The Electrotechnologies Research Program examines the applications of ultraviolet light, pulsed ultraviolet light, electric fields, pulsed electric fields, electron beams, sonic waves, and other emerging technologies for treatment of hazardous wastes and air pollution and for the disinfection of drinking water and wastewater. Dr. James Malley (603.862.1449, jim.malley@unh.edu) heads the program.

Recycled Materials and Waste Utilization
ERG's waste characterization and utilization activities are directed towards significantly increasing the amount of recycled materials used in construction of roads and highways. ERG leads an international Waste Utilization Consortium involved in a number of ongoing projects. ERG’s Recycled Materials Resource Center conducts research to ensure that recycling of materials in roads will be free of unexpected long-term environmental consequences. The goal is to make recycling possible in ways that produce physical performance of roads at least as good as with traditional materials at the same or lower cost. The RMRC is funded by the Federal Highway Administration and is directed by Dr. Kevin Gardner (603.862.4554, kevin.gardner@unh.edu).

Stormwater Treatment and Management
Although many of the stormwater management devices are based on sound theory, there is no requirement that they undergo independent, third-party scientific testing. The UNH Stormwater Center is designed to study stormwater-related water quality and quantity issues. One unique feature is the field facility to evaluate and verify the performance of stormwater management devices and technologies. Fifteen different management systems are currently undergoing side-by-side comparison testing under strictly controlled conditions. The Center is funded through NOAA and is directed by Dr. Rob Roseen (603.862.4024, robert.roseen@unh.edu).

Stream and Wetland Restoration Institute
The Stream and Wetland Restoration Institute is directed by Dr. Tom Ballestero (603.862.1405, tom.ballestero@unh.edu).

Stream and wetland restoration endeavors to return impaired systems to their near natural state. Often this is constrained by the many aspects of human activities, and that is why complete restoration may not always be possible. Restoration activities cover a very large spectrum, including but not limited to: changes to hydrology (for example instream flow, or connection of flood plain wetlands), dam removal, improved stream crossings, geomorphic stream designs, riparian buffers, improved floodplain conveyance, creating hyporheic fluxes, and improving fish and wildlife connectivity.

In order to ultimately get to the process of restoration, understanding fundamental ecosystem functions and characteristics is imperative. This understanding is biologic, hydrologic, geologic (sediment and geomorphology), hydraulic, and sociologic. The better the understanding of these system components, the more likely the success of the restoration activities.
# 2. Staff Directory

<table>
<thead>
<tr>
<th>Name</th>
<th>Phone</th>
<th>Email</th>
<th>Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damon Burt</td>
<td>603-862-1412</td>
<td><a href="mailto:damon.burt@unh.edu">damon.burt@unh.edu</a></td>
<td>New England Water Treatment Technology Assistance Center</td>
</tr>
<tr>
<td>David Kaiser</td>
<td>603-862-2719</td>
<td><a href="mailto:david.kaiser@noaa.gov">david.kaiser@noaa.gov</a></td>
<td>Coastal Response Research Center</td>
</tr>
<tr>
<td>Jamie Houle</td>
<td>603-767-7091</td>
<td><a href="mailto:jjhoule@unh.edu">jjhoule@unh.edu</a></td>
<td>UNH Stormwater Center</td>
</tr>
<tr>
<td>Joe Kazura (part time)</td>
<td>603-862-2012</td>
<td><a href="mailto:joe.kazura@unh.edu">joe.kazura@unh.edu</a></td>
<td>Environmental Research Group</td>
</tr>
<tr>
<td>Kathy Mandsager</td>
<td>603-862-1545</td>
<td><a href="mailto:kathy.mandsager@unh.edu">kathy.mandsager@unh.edu</a></td>
<td>Coastal Response Research Center</td>
</tr>
<tr>
<td>Kellen Sawyer</td>
<td>603-862-1412</td>
<td><a href="mailto:Kellen.sawyer@unh.edu">Kellen.sawyer@unh.edu</a></td>
<td>New England Water Treatment Technology Assistance Center</td>
</tr>
<tr>
<td>Madeleine Wasiewski</td>
<td>603-862-2206</td>
<td><a href="mailto:maddy.wasiewski@unh.edu">maddy.wasiewski@unh.edu</a></td>
<td>Environmental Research Group</td>
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<tr>
<td>Peter Dwyer</td>
<td>603-862-1106</td>
<td><a href="mailto:pdwyer@cisunix.unh.edu">pdwyer@cisunix.unh.edu</a></td>
<td>New England Water Treatment Technology Assistance Center</td>
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<tr>
<td>Scott Greenwood</td>
<td>603-862-0538</td>
<td><a href="mailto:scott.greenwood@unh.edu">scott.greenwood@unh.edu</a></td>
<td>Recycled Materials Resource Center</td>
</tr>
<tr>
<td>Timothy Puls</td>
<td>603-343-6672</td>
<td><a href="mailto:timothy.puls@unh.edu">timothy.puls@unh.edu</a></td>
<td>UNH Stormwater Center</td>
</tr>
</tbody>
</table>

| 2nd Floor Grad Office    | 603-862-1172  |                              |                                                   |
| 3rd Floor Grad Office    | 603-862-1197  |                              |                                                   |