Environmental Geology and Chemistry, BS

Jonathan Grabowski, PhD
Associate Professor
Marine Science Center, Nahant
781.581.370 x337

Michael P. Pollastri, PhD
Associate Professor and Chair
102 Hurtig Hall
617.373.2822

Danielle Lynch, Undergraduate Administrative Officer,
dw.lynch@neu.edu, 617.373.3176

The Departments of Marine and Environmental Sciences and Chemistry provide education in basic environmental science and chemistry-related disciplines. The overall objective of this combined major is to provide the fundamental scientific background and practical training for students as they prepare for environmental and chemically related careers or advanced study in fields including the traditional specialties such as toxicology, pollution, bio-remediation, environmental protection, education, law, and other endeavors that may draw upon an understanding of the chemical basis of the environment and the changes that will likely result from global warming.

Key general objectives are the development of qualitative and quantitative problem-solving skills and effective communication skills. Specific learning objectives for this combined major include the development of conceptual understanding and problem-solving abilities in the fundamental dynamics between the environment and its chemistry, be it analytical chemistry, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry. Students will perform quantitative measurements; learn proper laboratory practices, including safety; develop proficiency with modern instruments and computers for data acquisition and analysis; and learn the relevance of chemistry within the context of the abiotic and biotic environments.

Most of our combined majors will participate in the cooperative education program and thereby gain invaluable professional experience to augment their classroom and laboratory work. Not only does that experience add immensely to the overall education received, it also has the potential to provide contacts and references for later employment or graduate school admissions. Students in this major may also undertake research projects for at least one semester under the supervision of a faculty member. Sufficient electives are available in the program either to take more advanced courses or research within the department or to add courses in an area of special interest.

Program Requirements
Complete all courses listed below unless otherwise indicated. Also complete any corequisite labs, recitations, clinicals, or tools courses where specified and complete any additional courses needed beyond specific college and major requirements to satisfy graduation credit requirements.

University-Wide Requirements
All undergraduate students are required to complete the University-Wide Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/university-wide-requirements).

Environmental Geology Major Requirements

**Earth Foundations**
- ENVR 1200 and ENVR 1201: Dynamic Earth and Lab for ENVR 1200
  - 5
- ENVR 1202 and ENVR 1203: History of Earth and Life and Interpreting Earth History
  - 5
- ENVR 2310 and ENVR 2311: Earth Materials and Lab for ENVR 2310
  - 5

**Geomorphology**
- ENVR 2340 and ENVR 2341: Earth Landforms and Processes and Lab for ENVR 2340
  - 5

**Environmental Geology Intermediate/Advanced Electives**
Complete two intermediate or advanced electives from ENVR 2300 to ENVR 5999.
- 8-10

**Supporting Courses for Environmental Geology**

**Mathematics**
- MATH 1241: Calculus 1
  - 4
- MATH 1242: Calculus 2
  - 4

**Science Requirement**
Complete one of the following options:
- 10

**Biology Option**
- BIOL 1111 and BIOL 1112: General Biology 1 and Lab for BIOL 1111
- BIOL 1113 and BIOL 1114: General Biology 2 and Lab for BIOL 1113

**Physics Option**
- PHYS 1161 and PHYS 1162: Physics 1 and Lab for PHYS 1161
- PHYS 1165 and PHYS 1166: Physics 2 and Lab for PHYS 1165

**Chemistry Major Requirements**

**General Chemistry**
- CHEM 1211 and CHEM 1212: General Chemistry 1 and Lab for CHEM 1211
  - 5
- CHEM 1214 and CHEM 1215: General Chemistry 2 and Lab for CHEM 1214
  - 5

**Intermediate-Level Chemistry**
- CHEM 2311 and CHEM 2312: Organic Chemistry 1 and Lab for CHEM 2311
  - 5
- CHEM 2313 and CHEM 2314: Organic Chemistry 2 and Lab for CHEM 2313
  - 5
- CHEM 2331 and CHEM 2332: Bioanalytical Chemistry and Lab for CHEM 2331
  - 5
- CHEM 3403 and CHEM 3404: Quantum Chemistry and Spectroscopy and Lab for CHEM 3403
  - 5
- CHEM 3431 and CHEM 3432: Physical Chemistry and Lab for CHEM 3431
  - 5

NUpath Requirements
All undergraduate students are required to complete the NUpath Requirements (http://catalog.northeastern.edu/undergraduate/university-academics/nupath).

University-Wide Requirements
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Advanced-Level Chemistry
CHEM 3521  Instrumental Methods of Analysis  5
and CHEM 3522  and Instrumental Methods of Analysis Lab

Environmental Geology/Chemistry Integrative Requirement
Choose two courses from the following:
ENVR 3410  Environmental Geochemistry
ENVR 5190  Soil Science

Environmental Geology/Chemistry Major Credit Requirement
Complete 94 semester hours in the major.

Program Requirement
128 total semester hours required.

Plan of Study
Five Years, Three Co-ops in Summer 2/Fall

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Total Hours: 136