Environmental Engineering

1. University Requirements: (23)
   Writing, Rhetoric and American Cultures (WRA) 4
   Integrative Studies in Humanities (IAH) 8
   Integrative Studies in Social Sciences (ISS) 8
   Bioscience: BS 161 Cell and Molecular Biology 3

2. College Requirements: (30)
   CEM 141  General Chemistry 4
   CEM 151  General and Description Chemistry 4
   EGR 100  Introduction to Engineering Design 2
   EGR 102  Introduction to Engineering Modeling 2
   MTH 132  Calculus I 3
   MTH 133  Calculus II 4
   MTH 234  Multivariable Calculus 4
   MTH 235  Differential Equations 3
   PHY 183  Physics for Scientists & Engineers I 4
   PHY 184  Physics for Scientists & Engineers II 4
   CEM 161  Chemistry Laboratory I 1
   CHE 201  Materials and Energy Balances 3
   ENE 280  Principles of Environ Engr and Science 3
   ENE 421  Engineering Hydrology 3
   ENE 480  Environmental Measurements Lab 1
   ENE 481  Environ Chem: Equilibrium Concepts 3
   ENE 483  Unit Operations & Proc in Env Engr 3
   ENE 487  Microbiology for Environ Science & Engr 3
   ENE 489  Air Pollution: Science and Engineering 3

3. Major Requirements: (65-73)
   A. Complete all of the following courses: (44)
   BS 162  Organismal and Population Biology 3
   CE 221  Statics 3
   CE 271  Introduction to Civil Engineering 4
   CE 272  Civil and Environmental EngrAnalysis 3
   CE 321  Introduction to Fluid Mechanics (W) 4
   CE 495  Senior Design in Civil Engineering 4
   CEM 161  Chemistry Laboratory I 1
   CEM 142  General & Inorganic Chemistry 3
   CEM 152  Principles of Chemistry 3
   C. Complete one of the following courses: (3-4)
   CHE 321  Thermodynamics for Chem Engin 4
   ME 201  Thermodynamics 3
   D. Complete one of the following courses: (3-4)
   GLG 201  The Dynamic Earth 4
   GLG 301  Geology of the Great Lakes Region 3

E. Major Tracks: (12-18)
   Complete the requirements of one of the tracks below.
   Geo-environmental Engineering Track: (18)
   CE 312  Soil Mechanics 4
   CE 337  Civil Engineering Materials I 4
   CE 418  Geotechnical Engineering 3
   CE 485  Landfill Design 3
   ME 222  Mechanics of Deformable Solids 4
   Water Resources Track: (13)
   ENE 422  Applied Hydraulics 3
   GLG 411  Hydrogeology 3
   GLG 412  Glacial Geology & Rcrd of Climate Chng 4
   GLG 421  Environmental Geochemistry 3
   General Track: (12)
   1. Complete at least one of the following courses: (3)
   CE 485  Landfill Design 3
   ENE 422  Applied Hydraulics 3
   2. Additional credits to total 12 in the track, from technical courses at the 300 level or above, approved by the Department. Courses should be selected to provide some focus related to an application area of environmental engineering.

Other Electives (Variable)

The requirements listed above apply to students admitted to the Department of Civil & Environmental Engineering (CEE) beginning Fall 2011. The Department of Civil & Environmental Engineering (CEE) constantly reviews program requirements and reserves the right to make changes as necessary. Consequently, each student is strongly encouraged to consult with his/her adviser to obtain assistance in planning an appropriate schedule of courses. Students who have questions about Environmental Engineering should contact the Civil & Environmental Engineering Department Advising Office, 3579 Engineering Building, phone (517) 355-3274. For scheduling academic advising appointments visit: https://www.egr.msu.edu/adcalendar/

Total Credits Required for Degree 128

Last revised April 2011
Environmental Engineering
General Sample Program

Freshman Year

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<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
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<td>CEM 141/151</td>
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<td>CE 271</td>
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<td>CEM 161</td>
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<td>PHY 183</td>
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<td>CEM 142/152</td>
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Sophomore Year

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Junior Year

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<td>CE 321</td>
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<td>ENE 489</td>
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<td>IAH 211 or higher</td>
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<td>CHE 201</td>
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<td>BS 162</td>
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<td>ENE 453</td>
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Senior Year

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Program Description
The environmental engineering major is designed to prepare students with the engineering and scientific principles to analyze, design, and manage environmental systems, including water supplies, wastewater treatment facilities, air pollution control systems, surface and groundwater resources, and landfills. The program provides a thorough background in engineering fundamentals, along with a broad understanding of mathematical, physical, chemical, and biological concepts as they relate to environmental engineering.

Statement of Program Educational Objectives
The Department of Civil and Environmental Engineering provides opportunities to obtain the knowledge, skills and professional perspective needed for:

- entry to civil engineering practice and the pursuit of advanced studies;
- life-long learning;
- continuing professional development and leadership; and
- licensure; all leading to career success.

The undergraduate curriculum, courses, organizations and activities prepare graduates to:

- apply mathematics, science and contemporary methods to the formulation and solution of engineering problems, specific to environmental engineering;
- specify and conduct standard laboratory analyses, interpret data, formulate recommendations based on test results, and build understanding through experimentation, in three matrices: air, soil, and water;
- design systems, components and processes that conform to specifications and produce the intended benefits;
- communicate effectively in writing and speech;
- employ interpersonal and social skills required for working on a team, in an organization, and with the general public;
- honor professional ethics;
- respect societal and environmental impacts of engineering; and
- understand contemporary issues in engineering practice.

These educational objectives are promoted and supported by a departmental community of students, faculty and staff characterized by integrity and by respect for individuals, society, the environment, the engineering profession, and engineering education and institutions.

Last Revised April 2011