Civil Engineering

Accredited by the Engineering Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - telephone (410) 347-7700.

University Requirements (23-24)
Writing, Rhetoric and American Cultures (WRA) 4
Integrative Studies in Humanities (IAH) 8
Integrative Studies in Social Sciences (ISS) 8
Bioscience (one of the following):
  BS 110, BS 111, ENT 205, MMG 201, MMG 301, PLB 105, PSL 250, ZOL 141 3-4

College Requirements (29)
CEM 141 General Chemistry
OR
CEM 151 General and Descriptive Chemistry 4
CSE 131 Technical Computing and Problem Solving 3
MTH 132 Calculus I 3
MTH 133 Calculus II 4
MTH 234 Multivariable Calculus 4
MTH 235 Differential Equations 3
1 PHY 183 Physics for Scientists & Engineers I 4
1 PHY 184 Physics for Scientists & Engineers II 4

Major Requirements (58)
A. Complete all of the following courses:
  CE 221 Statics 3
  CE 271 Introduction to Civil Engineering 4
  CE 280 Principles of Environmental Engr and Science 3
  CE 305 Intro to Structural Analysis and Design 4
  CE 312 Soil Mechanics 4
  CE 321 Introduction to Fluid Mechanics 4
  CE 337 Civil Engineering Materials I 4
  CE 341 Transportation Engineering 3
  CE 495 Senior Design in Civil Engineering 3
  CEM 161 Chemistry Laboratory I 1
  ME 222 Mechanics of Deformable Solids 4
  ME 361 Dynamics 3
  STT 351 Probability and Statistics for Engineering 3

B. Select one of the following courses.
  BE 351 Environmental Thermodynamics 3
  ECE 345 Electronic Instrumentation and Systems 3
  ME 201 Thermodynamics 3
  MSE 250 Materials Science & Engineering 3

C. Select four courses from four of the seven areas listed below.

1. Structures
  CE 400 Structural Mechanics 3
  CE 405 Design of Steel Structure 3
  CE 406 Design of Concrete Structures 3

2. Geotechnical
  CE 418 Geotechnical Engineering 3

3. Hydraulics
  CE 421 Engineering Hydrology 3
  CE 422 Applied Hydraulics 3

4. Pavements
  CE 431 Pavement Design and Analysis I 3
  CE 432 Pavement Rehabilitation 3

5. Transportation
  CE 444 Principles of Traffic Engineering 3
  CE 448 Transportation Planning 3
  CE 449 Highway Design 3

6. Environmental
  CE 481 Environmental Chemistry 3
  CE 483 Water and Wastewater Treatment 3
  CE 485 Landfill Design 3
  CE 487 Microbiology for Environmental Health Engr 3

7. Construction Engineering and Management
  CE 471 Construction Engr-Equip, Methods and Plan 3
  CMP 411 Construction Project Scheduling 3
  CMP 415 Cost Estimating Analysis 3
  CMP 423 Construction Project Management 3

Other Electives (Variable)

Total Credits Required for Degree 128

The requirements listed above apply to students admitted to the Department of Civil & Environmental Engineering (CEE) beginning Spring, 2005. 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 Civil Engineering should contact the Civil & Environmental Engineering Department Advising Office, 354 Engineering Building, phone (517) 355-5107.

Some courses may have prerequisites, which are not otherwise required in the program. Students should check course descriptions to ensure they are aware of prerequisites.
Civil Engineering
Sample Program

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Sophomore Year</th>
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<tr>
<td>Fall</td>
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<td>CEM 161</td>
<td>PHY 183</td>
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<tr>
<th>Junior Year</th>
<th>Senior Year</th>
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<tbody>
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<td>Spring*</td>
</tr>
<tr>
<td>CE 305</td>
<td>CE 312</td>
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<td>CE 321</td>
<td>CE 341</td>
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<tr>
<td>ME 361</td>
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*These two semesters are interchangeable.

Statement of Program Educational Objectives

The Department of Civil and Environmental Engineering provides opportunities to obtain knowledge and skills needed for

• entry to civil engineering practice
• life-long learning and
• continuing professional development,
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;
• specify and conduct standard laboratory analyses, interpret data, formulated recommendations based on test results, and build understanding through experimentation;
• 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 professional and engineering education and institutions.

Last revised August, 2005
Civil Engineering with Environmental Option

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University Requirements (23-24)
- Writing, Rhetoric and American Cultures (WRA) 4
- Integrative Studies in Humanities (IAH) 8
- Integrative Studies in Social Sciences (ISS) 8
- Bioscience (one of the following):
  - BS 110, BS 111, ENT 205, MMG 201
  - MMG 301, PLB 105, PSL 250, ZOL 141 3-4

College Requirements (29)
- CEM 151 General and Descriptive Chemistry 4
- CSE 131 Technical Computing and Problem Solving 3
- MTH 132 Calculus I 3
- MTH 133 Calculus II 4
- MTH 234 Multivariable Calculus 4
- MTH 235 Differential Equations 3
- 1PHY 183 Physics for Scientists & Engineers I 4
- 1PHY 184 Physics for Scientists & Engineers II 4

Major Requirements (67-69)
A. Complete all of the following courses:
- CE 221 Statics 3
- CE 271 Introduction to Civil Engineering 4
- CE 280 Principles of Environmental Engr and Science 3
- CE 305 Intro to Structural Analysis and Design 4
- CE 312 Soil Mechanics 4
- CE 321 Introduction to Fluid Mechanics 4
- CE 421 Engineering Hydrology OR
- CE 422 Applied Hydraulics 3
- CE 480 Environmental Chemistry Lab 1
- CE 481 Environmental Chemistry 3
- CE 483 Water and Wastewater Treatment 3
- CE 485 Landfill Design 3
- CE 487 Microbiology for Environmental Health Egr 3
- CE 495 Senior Design in Civil Engineering 3
- CEM 152 Principles of Chemistry 3
- CEM 161 Chemistry Laboratory I 1
- CHE 201 Material and Energy Balances 3
- ME 222 Mechanics of Deformable Solids 4
- STT 351 Probability and Statistics for Engineering 3

B. Select one of the following courses.
- BE 351 Environmental Thermodynamics 3
- CHE 321 Thermodynamics for Chemical Engineers 4
- ME 201 Thermodynamics 3

C. Select one of the following courses:
- CE 337 Civil Engineering Materials I 4
- CE 341 Transportation Engineering 3
- CEM 251 Organic Chemistry I 3
- CEM 351 Organic Chemistry I 3
- ME 361 Dynamics 3

D. Select two courses from two of the five areas below. Areas three, four and five will require additional prerequisites.

1. Structures
- CE 400 Structural Mechanics 3
- CE 405 Design of Steel Structure 3
- CE 406 Design of Concrete Structures 3

2. Geotechnical
- CE 418 Geotechnical Engineering 3

3. Pavements
- CE 431 Pavement Design and Analysis I 3
- CE 432 Pavement Rehabilitation 3

4. Transportation
- CE 444 Principles of Traffic Engineering 3
- CE 448 Transportation Planning 3
- CE 449 Highway Design 3

5. Construction Engineering and Management
- CE 471 Construction Engr-Equip, Methods and Plan 3
- CMP 411 Construction Project Scheduling 3
- CMP 415 Cost Estimating Analysis 3
- CMP 423 Construction Project Management 3

Other Elective (Variable)

Total Credits Required for Degree 128

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Some courses may have prerequisites, which are not otherwise required in the program. Students should check course descriptions to ensure they are aware of prerequisites.

1If PHY 231 is taken in place of PHY 183, PHY 233B must be completed. If PHY 232 is taken in place of PHY 184, PHY 234B must also be completed.
Civil Engineering with Environmental Option
Sample Program

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<th>Sophomore Year</th>
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<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Senior Year</th>
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