

## 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)

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):	3-4
BS 110, BS 111, ENT 205, MMG 201, MMG 301, PLB 105, PSL 250, ZOL 141	

### College Requirements (30)

<sup>1</sup> CEM 141 General Chemistry	4
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#### OR

CEM 151 General and Descriptive 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

### Major Requirements (61-63)

#### a. Complete all of the following courses:

CE 221 Statics	3
CE 271 Introduction to Civil Engineering	4
CE 280 Principles of Environ Engr and Science	3
CE 305 Introduction to Structural Analysis & Design	4
CE 312 Soil Mechanics	4
CE 321 Introduction to Fluid Mechanics	4
<sup>2</sup> CE 337 Civil Engineering Materials I	4
<sup>2</sup> 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
STT 351 Probability and Statistics for Engineering	3

#### b. Complete one of the following courses:

CE 461 Computational Methods in Civil Engineering	3
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#### OR

ME 361 Dynamics	3
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#### c. Complete one of the following courses:

BE 351 Environmental Thermodynamics	3
ECE 345 Electronic Instrumentation and Systems	3
ME 201 Thermodynamics	3
<sup>3</sup> MSE 250 Materials Science and Engineering	3

\*EGR 100 and EGR 102 are required for all students matriculating at MSU beginning Fall Semester, 2008. Students who matriculate before Fall 2008 must complete CSE 131 in place of EGR 102.

### d. Major Tracks (18)

Complete 18 credits of electives as specified below. At least 9 credits of one primary track must be completed as specified. The additional 9 credits must include one course each from three other (and different) tracks. Construction Engineering and Management courses may count towards the additional 9 credits. See the Civil Engineering Academic Adviser for specific track sample programs.

#### Environmental Track

##### 1. Both of the following courses:

CE 481 Environmental Engineering Chemistry	3
CE 483 Water and Wastewater Treatment	3

##### 2. One of the following courses:

CE 421 Engineering Hydrology	3
CE 485 Landfill Design	3
CE 487 Microbiology for Environ Health Engr	3

#### Geotechnical Track

##### 1. Complete both of the following courses:

CE 418 Geotechnical Engineering	3
CE 485 Landfill Design*	3

##### 2. Complete one of the following courses:

CE 431 Pavement Design and Analysis I	3
CE 815 Selected Topics in Geotechnical Engr	3
CE 818 Advanced Geotechnical Design	3

#### Pavements Track

##### 1. Complete both of the following courses:

CE 431 Pavement Design and Analysis I	3
CE 432 Pavement Rehabilitation	3

##### 2. Complete one of the following courses:

CE 418 Geotechnical Engineering	3
CE 831 Advanced Concrete Pvmnt Anlys & Desn	3
CE 832 Advanced Asphalt Pvmnt Anlys & Desn	3

#### Structures Track

##### 1. Complete both of the following courses:

CE 405 Design of Steel Structure	3
CE 406 Design of Concrete Structures	3

##### 2. Complete one of the following courses:

CE 400 Structural Mechanics	3
CE 805 Advanced Design of Steel Structures	3
CE 806 Advanced Structural Concrete Design	3

<sup>1</sup> Choose CEM 151 if pursuing Environmental Engineering Concentration.

<sup>2</sup> CE 337 and 341 may not be required if pursuing Environmental Engineering Concentration.

<sup>3</sup> Choose BE 351, CHE 321 or ME 201 if pursuing Environmental Engineering Concentration.

**Transportation Track**

**1. Complete both of the following courses:**

CE 448	Transportation Planning	3
CE 449	Highway Design	3

**2. Complete one of the following courses:**

CE 431	Pavement Design and Analysis I	3
CE 432	Pavement Rehabilitation	3
CE 444	Principles of Traffic Engineering	3

**Water Resources Track**

**1. Both of the following courses:**

CE 421	Engineering Hydrology	3
CE 422	Applied Hydraulics	3

**2. One of the following courses:**

CE 423	Applied Hydrologic Analysis & Design	3
CE 822	Groundwater Modeling	3
GLG 411	Hydrogeology	3
GLG 412	Glacial Geology & Rcrd of Climate Chng	4

**General Track**

Students may choose a general track in fulfillment of the Primary Track requirement. Students must complete 12 credits with courses from each of four different tracks above. Students must also complete 6 additional credits across all tracks which may include course work from Construction Engineering and Management courses below.

**Construction Engineering and Management Courses**

CE 471	Construction Engr-Equip, Mthds & Plng	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 Fall 2008. 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, 3579 Engineering Building, phone (517) 355-3274. For scheduling academic advising appointments visit: <https://ntweb11.ais.msu.edu/AAS/>

**Last revised Aug 2008**

## Environmental Engineering Concentration for Civil Engineering

The environmental engineering concentration is available to students who are enrolled in the Bachelor of Science degree program in civil engineering. Students who elect this concentration must complete the following courses. The concentration will be noted on the student's transcript. See the Civil Engineering Academic Adviser for a sample program specific to the Environmental Engineering Concentration.

### 1. Complete all of the following courses (23):

CE 480	Environmental Measurements Laboratory	1
CE 481	Environmental Engineering Chemistry	3
CE 483	Water and Wastewater Treatment	3
CE 485	Landfill Design	3
CE 487	Microbiology for Environ Health Engr	3
CEM 151	General and Descriptive Chemistry	4
CEM 152	Principles of Chemistry	3
CHE 201	Material and Energy Balances	3

Note: CEM 151 may be used to satisfy both the requirements for the Environmental Engineering concentration and the requirements for the Bachelor of Science in Civil Engineering. CE 481, 483 and 485 may be used to satisfy both the requirement for the Environmental Engineering concentration and 9 credits of the track requirements for the Bachelor of Science in Civil Engineering.

### 2. Complete one of the following courses (3):

BE 351	Environmental Thermodynamics	3
CHE 321	Thermodynamics for Chemical Engr	3
ME 201	Thermodynamics	3

Note: BE 351 and ME 201 may be used to satisfy both the requirements for the Environmental Engineering concentration and the requirements for the Bachelor of Science in Civil Engineering.

### 3. Complete one of the following courses (3):

CE 421	Engineering Hydrology	3
CE 422	Applied Hydraulics	3

Note: CE 421 or CE 422 may be used to satisfy both the requirements for the Environmental Engineering concentration and 3 credits of the track requirements for the Bachelor of Science in Civil Engineering.

### 4. Complete one of the following courses (3-4):

CE 337	Civil Engineering Materials I	4
CE 341	Transportation Engineering	3
CE 806	Advanced Structural Concrete Design	3
CEM 251	Organic Chemistry I	3
CEM 351	Organic Chemistry I	3

### 5. Major Tracks

Complete 6 credits from two Major Tracks (d.), excluding the Environmental Track and the Water Resources Track. Eighteen credits total are required from the Major Track; 9 credits from Section 1 above, 3 credits from Section 3 above, plus an additional 6 credits from two other tracks.

## Civil Engineering General Sample Program

(A different sample program applies to the Environmental Engineering Concentration.  
 See the Civil Engineering Academic Adviser for that sample program. )

Freshman Year				Sophomore Year			
Fall	Credits	Spring	Credits	Fall	Credits	Spring	Credits
CEM 141/151	4	CE 271	4	<b>CE 221</b>	3	Bioscience	3/4
CEM 161	1	EGR 102	2	Elective	Va	CE 280	3
EGR 100	2	MTH 133	4	IAH 20X	4	IAH 2XX	4
ISS 2XX	4	PHY 183	4	MTH 234	4	<b>ME 222</b>	4
MTH 132	3	WRA 1XX	4	PHY 184	4	MTH 235	3
<b>Total</b>	<b>14</b>	<b>Total</b>	<b>18</b>	<b>Total</b>	<b>15+/Va</b>	<b>Total</b>	<b>17/18</b>

Junior Year				Senior Year			
Fall	Credits	Spring	Credits	Fall	Credits	Spring	Credits
CE 3XX	4	CE 305	4	CE 461 or ME 361	3	CE 495	3
CE 3XX	4	CE 3XX	4	Elective	Va	Elective	Va
CE 341	3	Elective	Va	Primary Track	3	ISS 3XX	4
STT 351	3	Item C. Elec.	3	Other Track	3	Primary Track	3
		Primary Track	3	Other Track	3	Other Track	3
<b>Total</b>	<b>14</b>	<b>Total</b>	<b>14+/Va</b>	<b>Total</b>	<b>12+/Va</b>	<b>Total</b>	<b>13+/Va</b>

## Civil Engineering

The general sample civil engineering course program above will satisfy the course requirements for a BS degree in civil engineering, except for the BS degree in civil engineering with the environmental engineering concentration. Students interested in pursuing this concentration should consult with the civil engineering academic adviser. The sample civil engineering course program recommends freshman and sophomore year course work that is common for all areas of specific civil engineering interest except for the environmental engineering concentration. Please note that it is strongly recommended that CE 221 and ME 222 be taken in the sophomore year.

### Statement of Program Educational Objectives

The Department of Civil and Environmental Engineering provides opportunities to obtain the knowledge, skills and professional prospective 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.