

# University of Wisconsin – Milwaukee

## College of Engineering and Applied Science

# CIVIL ENGINEERING CURRICULUM

The minimum number of credits required to complete the Bachelor of Science in Engineering with a major in Civil Engineering is 127 credits. Students who need background preparation courses in math, English, and chemistry may need additional credits. See information below regarding placement examinations.

<b>Engineering Core Courses (41 credits)</b>		<b>Credits</b>	<b>Prerequisite</b>
EAS 100	CEAS Freshman Orientation	1	none
EAS 200	Professional Seminar	0	Soph St
Ind Eng 101	Fundamentals of Graphics	3	Math 105 (C)
Ind Eng 210	Introduction to Design Techniques	3	Soph St
Ind Eng 360	Engineering Economic Analysis	3	Jr St
Civ Eng 280	Computer-Based Engineering Analysis	3	Math 226 or 231, CompSci 132 or equivalent
Civ Eng 201	Statics	3	Math 232
Civ Eng 202	Dynamics	3	Civ Eng 201, Math 233 (C)
Civ Eng 303	Strength of Materials	4	Civ Eng 201, Math 233 (C)
MatlEng 201	Engineering Materials	4	Chem 102 or 117
ElecEng 234	Linear Systems Analysis	4	Math 233
ElecEng 306	Introduction to Electrical Engineering	4	Physics 210, ElecEng 234
MechEng 301	Basic Engineering Thermodynamics	3	Math 233, Physics 209
MechEng 320	Introduction to Fluid Mechanics	3	MechEng 301 (C), ElecEng 234, CivEng 202

<b>Civil Engineering Major (21 credits)</b>		
Civ Eng 250	Surveying for Construction	3
Civ Eng 335	Soil Mechanics	3
Civ Eng 372	Introduction to Structural Design	4
Civ Eng 411	Water Resources Design	3
Civ Eng 490	Transportation Engineering	3
Civ Eng 495	Senior Design	3
Civ Eng 413	Environmental Engineering	3

<b>*Mathematics (10 -19 credits)</b>		(19 credits of Mathematics if Math 105 required)
One of the following <b>Calculus</b> sequences must be completed:		
Math 225-226-232-233		Math placement score, or previous course with at least "C" grade.
Math 231-232-233		
Math 221- 222 (Honors)		

<b>*Chemistry (8-12 credits)</b>		(12 credits of Chemistry if Chem 100 required)
One of the following sequences must be completed:		
Chem 117-118 (Suggested) or Chem 102-104		Chem 100 with "C" grade or Chemistry placement test

<b>Physics (8 credits)</b>		
Physics 209 – 210		See schedule of classes

<b>General Education Requirements</b>		
<i>Distribution Requirements (15 credits)</i>		
<b>Art</b>	3	none
<b>Humanities</b>	6	none
<b>Social Science</b>	6	none
One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.		
<b>Free Elective</b>	3	
<i>Competency Requirements</i>		
<b>*English Composition (0-6 credits)</b>		
The English Composition requirement is satisfied by:		
1. earning a 637 or better on the English placement test, or 2. earning a grade of C or higher in English 102 (Satisfaction of English Composition required for Junior status.)		
<b>Foreign Language (0-8 credits)</b> (for new freshman starting fall 1999)		
The foreign language requirement can be completed with one of these options:		
1. Two years of a single foreign language in high school		
2. Two semesters of a single foreign language in college		
3. Demonstrate ability by examination		

<b>*Placement Examinations</b>	
Once admitted to UWM, most engineering students are required to take placement examinations in mathematics, English and chemistry. Students with previous college level credits in these areas may not be required to take placement exams. The placement exams are administered by the UWM Testing Center, Mellencamp Hall, room B28, (414) 229-4689. The results of these tests help students determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above. Possible Math placements for engineering students are Math 090-095-105-225-117&231-231. Possible English placements are English 090-095-101-102. Possible Chemistry placements are Chemistry 100,102or117.	

## Technical Electives – Civil Engineering 18 CREDITS REQUIRED

The Civil Engineering and Mechanics Department offers numerous elective courses which allow students to work in one of **four areas** of concentration. Normally a minimum of 12 credits will be taken in an area of concentration. **Students who do not follow one of the four areas of concentration will require approval by the Department Chairperson for their programs.**

- 1 Students interested in **geotechnical engineering** should take Civ Eng 456, and select at least two courses from Civ Eng 360, 412, 457, 472, and 492. Students are also strongly recommended to take Geo Sci 470.
- 2 Students interested in **municipal and transportation engineering** should select at least three courses from Civ Eng 492, 590, 592, 594, 596, and 610.
- 3 Students interested in **structural engineering** should take Civ Eng 360,463,571 and 572 and select at least two courses from Civ Eng 456, 560, 467, 573, 574, and 578.
- 4 Students interested in **water resources and environmental engineering** should take Civ Eng 412 and 511 and select at least one course from Civ Eng 413, 456, 521, and 610.

**Group A Technical Electives:** Three to six courses carrying a minimum of 5 design credits must be taken from the following list.

		<u>Credits</u>	<u>Prerequisite</u>
Civ Eng 412	Applied Hydrology	3	Jr St, Math 233, MechEng 320
Civ Eng 456	Foundation Engineering	3	Jr St, Civ Eng 335
Civ Eng 463	Introduction to Finite Elements	3	ElecEng 234,Civ Eng 303, MechEng 320 (C)
Civ Eng 492	Environmental Impact Assessment	3	
Civ Eng 511	Water Supply and Sewerage	Sr. St.	Jr St, Civ Eng 411
Civ Eng 521	Water Quality Assessment	3	Sr. St, Civ Eng 411
Civ Eng 571	Design of Concrete Structures	3	Jr. St. Civ Eng 360, 372
Civ Eng 572	Design of Steel Structures	3	Jr St, Civ Eng 360,372
Civ Eng 573	Design of Masonry Structures	3	Civ Eng 360,372
Civ Eng 574	Design of Prestressed Concrete Structures	3	Jr St Civ Eng 360, 372
Civ Eng 578	Design of Wood Structures	3	Civ Eng 360,372
Civ Eng 590	Urban Transportation Planning	3	Sr. St.
Civ Eng 592	Traffic Control	3	Sr. St.
Civ Eng 594	Physical Planning and Municipal Engineering	3	Sr. St., Cons Instr
Civ Eng 596	Transportation Facilities Design	3	Civ Eng 355 (C), Civ Eng 490
Civ Eng 610	Introduction to Water and Sewage Treatment	3	Sr. St., Civ Eng 511
Civ Eng 614	Hazardous Waste Management	3	Civ Eng 413
Matl 431	Welding Engineering	3	Jr. St,MatlEng 201

Students may select additional courses from the Group A electives or no more than 3 courses from the electives in Groups B and C listed below.

**Group B Technical Electives:** Select no more than 3 courses from this list..

Civ Eng 360	Introduction to Structural AnalysisI	3	Civ Eng 303
Civ Eng 401	Intermediate Strength of Materials	3	Jr St, Civ Eng 303
Civ Eng 431	Materials of Construction	3	Jr. St, Civ Eng 303
Civ Eng 502	Experimental Stress Analysis	3	Jr. St. Civ Eng 303
Civ Eng 560	Structural Analysis	3	Jr St, Civ Eng 360
ElecEng 367	Introduction to Microprocessors	3	ElecEng 354, CompSci 151

**Group C Technical Electives:** Select no more than 2 courses from this list.

Chem 341	Introductory Survey of Organic Chem.	3	Chem 104 or 118
CivEng 580	Applied Mechanics I	3	Jr St, ElecEng 234
Comp Sci 151	Introduction to Scientific Programming in Fortran	3	Math 231 (C) or Math 225 (C)
Comp Sci 153	Introduction to Scientific Programming in C++	3	Math 231 (C) or Math 225 (C)
EAS 001	Co-op Work Period	3 <sup>1</sup>	None
English 206	Technical Writing	3	Soph St, Eng Comp Reqmt
Geog 403	Remote Sensing	3	See Schedule
Geog 430	Geography of Transportation	3	Jr. St., Geog 115
Geo Sci 414	Structural Geology	3	Geo Sci 302, Math 231(C)
Geo Sci 463	Physical Hydrogeology	3	Jr St., Geo Sci 100 or 101, Math 232
Geo Sci 464	Chemical Hydrogeology	3	Jr St., Chem 102
Geo Sci 470	Engineering Geology	3	Jr St, MechEng 335,Math 231
Ind Eng 455	Basic Optimization Techniques	3	Jr St, ElecEng 234
Ind Eng 465	Operations Analysis	3	Ind Eng 467
Ind Eng 467	Intro Statistics for Physical Sciences & Engineering	3	Jr St, Math 233
Math 313	Linear Programming and Optimization	3	Jr St, Math 234
Math 413	Introduction to Numerical Analysis	3	Jr St, Math 234
MechEng 311	Introduction to Heat Transfer	3	MechEng 301, Civ Eng 202, ElecEng 234
Urb Plan 591	Introduction to Urban Geographic Information Systems	3	Jr. St

<sup>1</sup>Students who earn 3 or more credits of Co-op may use 3 of those credits as approved technical electives.

**College of Engineering and Applied Science**  
**University of Wisconsin – Milwaukee**  
**P.O. Box 784**  
**Milwaukee, WI 53201**

Office of Student Services (414) 229-4667  
 Engineering & Mathematical Science Building (EMS) Room E386

Department of Civil Engineering and Mechanics (414) 229-5422  
 Engineering & Mathematical Science Building (EMS) Room E556

Web Site: [www.ceas.uwm.edu](http://www.ceas.uwm.edu)