

# 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 (37 credits)</b>		<b>Credits</b>	<b>Prerequisite</b>
EAS 100	CEAS Freshman Orientation (recommended only)	1	none
EAS 200	Professional Seminar	1	none
Ind Eng 111	Introduction to Engineering <sup>1</sup>	3	Math 116 (C)
Ind Eng 112	Engineering Drawing & Computer Aided Design/Drafting <sup>1</sup>	3	Math 116
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 105 or 102 or 117
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, Civ Eng 202

<sup>1</sup> MechEng 110 and 111 may substitute for Ind Eng 111 and 112 for students transferring from another engineering major.

<b>Civil Engineering Major (23 credits)</b>			
Civ Eng 250	Surveying for Construction	3	Soph st., Math 232
Civ Eng 335	Soil Mechanics	3	Civ Eng 303
Civ Eng 372	Introduction to Structural Design	4	Jr St, Civ Eng 303
Civ Eng 411	Water Resources Design	3	Jr St, MechEng 320
Civ Eng 413	Environmental Engineering	3	Mech Eng 320
Civ Eng 490	Transportation Engineering	3	Civ Eng 280, Jr St
Civ Eng 494	Principles of Civil Engineering Design	1	Sr St in Civil Engineering
Civ Eng 495	Senior Design	3	Civ Eng 335,372,411,490

<b>*Mathematics (14 -16 credits)</b>			
One of the following <b>Calculus</b> sequences must be completed:		(16 credits typical: Math 231,232,233, ElecEng 234)	
Math 231-232-233	12	Math placement score, or previous course with "C" grade.	
Or Math 221- 222 (Honors)	10		
And ElecEng 234 Analytical Methods in Engineering	4	Math 233 (P)	

<b>*Chemistry (5-10 credits)</b>			
One of the following sequences must be completed:			
Chem 105 (Suggested) or Chem 102 -104		Chem 100 with "C" grade or Chemistry placement test	

<b>Physics (8 credits)</b>			
Physics 209 – 210	8		

<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 <b>UWM cultural diversity requirement</b> . ( <i>Commun 103 Public Speaking or Commun 105 Business and Professional Communication are recommended as part of the distribution requirements</i> )			
<b>Free Elective</b>	2		
<i>Competency Requirements</i>			
<b>*English Composition (0-6 credits)</b>			
The English Composition requirement is satisfied by:			
1. Earning a satisfactory score on the English placement test, <b>or</b>			
2. Earning a grade of C or higher in English 102			
3. Transferring a grade of C or better in a course equivalent to English 102 or higher level expository writing course			
<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 090-095-105-116-117-225-231-221. Possible English placements are English 090-095-101-102. Possible Chemistry placements are Chemistry 100, 102 or 105.			

## Technical Electives – Civil Engineering 21 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 three courses from Civ Eng 360, 412, 463, 492, and 598. 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, 598, and 610.
- 3 Students interested in **structural engineering** should take Civ Eng 360, 463, 571, 572 and select at least two courses from Civ Eng 456, 560, 573, 574, 578 and 579.
- 4 Students interested in **water resources and environmental engineering** should select at least three courses from Civ Eng 412, 511, 521, and 610

**Group A Technical Electives:** Take a minimum of 12 credits of Group A electives or a minimum of 9 credits of Group A electives and 3 credits of Group B electives..

		<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	Sr. St.
Civ Eng 511	Water Supply and Sewerage	3	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	Jr St, 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
Civ Eng 579	Earthquake Engineering	3	Sr St, Civ Eng 571 or 572
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 335 (C), Civ Eng 490
Civ Eng 598	Pavement Analysis and Design	3	Jr. St, Civ Eng 335
Civ Eng 610	Introduction to Water and Sewage Treatment	3	Sr. St., Civ Eng 413
Civ Eng 614	Hazardous Waste Management	3	Civ Eng 413

**Group B Technical Electives:** Select no more than 9 credits from this list.

Civ Eng 360	Introduction to Structural Analysis	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, 372
Civ Eng 580	Engineering Analysis in Applied Mechanics	3	Jr St, ElecEng 234

**Group C Technical Electives:** Select 3 to 6 credits from this list of science and math courses.

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, Civ Eng 335, Math 231
Ind Eng 467	Intro Statistics for Physical Sciences & Engineering	3	Jr St, Math 233
Any Mathematics course 400-level or above, Math 313, Math 321, Math 322			
Any Chemistry course 200-level or above, Chem 104 <sup>1</sup>			
Any Physics course 300-level or above, Physics 214, Physics 215			
Any Biology course 150-level or above			
Any Atmospheric Science course 200-level or above			

<sup>1</sup>Students who take Chemistry 102 (or 117) may use Chemistry 104 (118) to satisfy three credits of the Group C technical elective requirement.

**Group D Technical Electives:** Select no more than 3 credits from this list.

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
Comp Sci 201	Introductory Computer Programming	3	Math 105
Ind Eng 455	Basic Optimization Techniques	3	Jr St, ElecEng 234
Ind Eng 465	Operations Analysis	3	Ind Eng 467
Matl 431	Welding Engineering	3	Jr. St, MatlEng 201
MechEng 321	Basic Heat Transfer	4	MechEng 301
Urb Plan 591	Introduction to Urban Geographic Information Systems	3	Jr St
Geog 215	Introduction to Geographic Information Sciences	3	None

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

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