

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.

Engineering Core Courses (33 credits)		Credits	Prerequisite
EAS 200	Professional Seminar	1	none
Ind Eng 111	Introduction to Engineering ¹	3	Math 116 (C)
Ind Eng 112	Engineering Drawing & Computer Aided Design/Drafting ¹	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 ²	4	Chem 105 or 102 or 117
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

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

² Civil Engineering majors may take Civ Eng 431 (with proper prerequisites) in place of MatlEng 201.

***Civil Engineering Major (23 credits)**

Civ Eng 250	Engineering Surveying	3	Sophst., 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	Engineering Principles of 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

****Mathematics (14 -16 credits)**

One of the following Calculus 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 232 (P)

****Chemistry (5-10 credits)**

One of the following sequences must be completed:			
Chem 105 (Suggested) or Chem 102 -104			Chem 100 with "C" grade or Chemistry placement test

Physics (8 credits)

Physics 209 – 210	8
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Other Natural Sciences (3 credits)

Any Geo Sci course 300 level or above, or Any Bio Sci course 150-level or above, or Any Atm Sci course 200 level or above	3
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General Education Requirements

Distribution Requirements (15 credits)

Art	3	none
Humanities	3	none
Social Science	6	none
English 310 Writing, Speaking and Technoscience in the 21st Century	3	English competency
Free Electives	3	

Cultural Diversity - One of the arts, humanities, or social science courses selected must also meet the UWM cultural diversity requirement.

Competency Requirements

****English Composition (0-6 credits)**

The English Composition requirement is satisfied by:

- Earning a satisfactory score on the English placement test, **or**
- Earning a grade of C or higher in English 102
- Transferring a grade of C or better in a course (3 credits or more) equivalent to English 102 or higher level expository writing course

Foreign Language (0-8 credits) (for new freshman starting fall 1999) The foreign language requirement can be completed with one of these options:

- Two years of a single foreign language in high school
- Two semesters of a single foreign language in college
- Demonstrate ability by examination

*** Admission to Major:** 1. Complete Math 231 (or 221) with C or better grade. 2. Complete the English composition requirement (OWCA) 3. Complete Chem 100 with C or better grade or satisfactory placement score. 4. Obtain a minimum GPA as set by the department. A 3.00 GPA guarantees admission to any CEAS major. Courses may be repeated only once. No more than two courses may be repeated.

The program may impose major status as a prerequisite for courses numbered 200 or above.

**** Placement Examinations:** Students without previous college level credits in Math, Chemistry or English may be required to take placement exams. The results of these tests determine the appropriate course in which to register. Background prerequisite courses may be required in addition to the courses listed above.

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.
- 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 431, 456, 466, 560, 573, 574 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 15 to 21 credits of Group A electives. All non-required Civ Eng courses 400-699 are Group A Technical Electives			
		<u>Credits</u>	<u>Prerequisite</u>
Civ Eng 311	Introduction to Energy, Environment and Sustainability	3	Jr. St.
Civ Eng 360	Introduction to Structural Analysis	3	Civ Eng 303
Civ Eng 412	Applied Hydrology	3	Jr St, Math 233, MechEng 320
Civ Eng 431	Materials of Construction	3	Jr. St, Civ Eng 303
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 466	Mechanics of Composite Materials	3	Jr. St, Civ Eng 303
Civ Eng 480	Software Applications in Civil Engineering	3	Jr. St.
Civ Eng 492	Environmental Impact Assessment ³	Sr. St.	
Civ Eng 502	Experimental Stress Analysis	3	Jr. St, Civ Eng 303
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 555	Sustainable Construction Materials and Technologies	3	Jr. St.
Civ Eng 560	Intermediate Structural Analysis	3	Jr. St., 360, 372
Civ Eng 571	Design of Concrete Structures	3	Jr. St, Civ Eng 360 (C), 372
Civ Eng 572	Design of Steel Structures	3	Jr St, Civ Eng 360 (C) ,372
Civ Eng 573	Design of Masonry Structures	3	Jr St, Civ Eng 360 (C) ,372
Civ Eng 574	Design of Prestressed Concrete Structures	3	Jr St Civ Eng 360 (C) , 372
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 616	Computational Hydraulics and Environmental Flows	3	Jr. St., Civ Eng 411
Civ Eng 691	Topics in Civil Engineering	3	Based on topic

Group B Technical Electives: Select no more than 6 credits from this list.			
EAS 001	Co-op Work Period	3 ¹	None
English 206	Technical Writing	3	Soph St, Eng Comp Reqmt
Geog 403	Remote Sensing	3	Jr St; Geo 215
Comp Sci 250	Introductory Computer Programming	3	Math Placement code 40 or Math 116 or Math 211
ElecEng 301	Electrical Circuits	3	Physics 210
Ind Eng 367	Intro Statistics for Physical Sciences & Engineering	3	B- or better Math 211 or 213; C or better Math 221 or 231
Ind Eng 455	Operations Research I	3	Jr St, Math 233
Ind Eng 465	Operations Research II	3	Ind Eng 367, 455
Ind Eng 575	Design of Experiments	3	Ind Eng 367 or Equivalent
MatlEng 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
Any Mathematics course 400-level or above, Math 313, Math 321, Math 322, or			
Any Chemistry course 200-level or above, Chem 104 ² , or			
Any Physics course 300-level or above, Physics 214, Physics 215			

¹Students who earn 3 or more credits of Co-op may use 3 of those credits as approved technical electives.
²Students who take Chemistry 102 may use Chemistry 104 to satisfy three credits in this group.

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