

Effective Spring 2005

**NEW CURRICULUM IN CIVIL AND ENVIRONMENTAL ENGINEERING
(For The Degree Of Bachelor Of Science -- Civil Engineering,
Construction Engineering and Management Option)**

PART 1**

<http://www.engr.wisc.edu/cee/current/undergrad/curriculum/spring98/const/>

SUMMARY

Mathematics and Statistics Requirement	19 cr
Natural Sciences Requirement	13 cr
Engineering Science Requirement	23 cr
Civil Engineering	14 cr
Applied Engineering Requirement	39 cr
Communication Skills Requirement	5 cr
Liberal Studies Requirement	<u>16 cr</u>
	129 cr

CONTENTS

	<u>Page</u>
I. Mathematics and Statistics	2
II. Natural Sciences	2
III. Engineering Science	2
IV. Civil Engineering	2
V. Applied Engineering	3
Construction Management	3
Design Engineering	3
Technical Electives	5
VI. Communication Skills	4
VII. Liberal Studies	5
Suggested 8-Semester Course Sequence	6
Flow Chart	8
Design Credit Work Sheet	9
Scholastic Record Form	10

*Approved at CEE Department Meeting October 16, 1990, Revised March 26, 1996, March 17, 1997, Jan. 20, 1998, FAC A98-07, Feb. 24, 1998, Feb. 27, 2001, March 27, 2001, July 2001, Oct. 2, 2001, Feb. 17, 2004

**Part 2 of the curriculum further defines the applied engineering requirements along with suggested liberal studies courses.

I. MATH/STATISTICS REQUIREMENT (19 Cr)

Math 221	Calculus & Analytical Geometry	5 cr
Math 222	Calculus & Analytical Geometry	5 cr
Math 234	Calculus-Functions of Variables	3 cr
Stat 224	Elementary Statistical Analysis	3 cr
Math 319	Techniques in Ordinary Differential Equations	3 cr
	OR	
Math 320	Linear Algebra and Differential Equations	3 cr

All transfer students must have 3 equivalent calculus courses to meet the calculus requirement. If these courses total fewer than 12 cr, one additional math course is required. If they total fewer than 13 cr, additional natural science or applied engineering elective credit may be taken to bring the total to 13 cr. All transfer students must have an introduction to differential equations.

Statistics 311, Introduction to Mathematical Statistics, 4 cr, can be substituted for Statistics 224. The excess 1 credit may be used in the Applied Engineering Requirement. Transfer students offering substitute statistics courses may only submit courses that have a calculus course as a prerequisite.

II. NATURAL SCIENCES REQUIREMENT (13 Cr)

Chemistry 109 (5 cr) or Chemistry 103 (4 cr) and 104 (5 cr)	5 cr min.
Physics 202 or 208	5 cr
Geology 100 (3 cr), 101 (5 cr), or 106 (3 cr)	3 cr min.

If the Chemistry 103-104 (9 cr.) sequence is taken in place of Chemistry 109, only five of the nine credits may be used to satisfy the Chemistry requirement. The remaining four credits are not counted toward the degree requirement and are classified as "other." Transfer students may use these credits to satisfy credit deficiencies in the Natural Science categories. A transfer student may satisfy the Physics requirement with no less than four credits and the Chemistry requirement with no less than four credits. Credit deficiencies may be satisfied with other Natural Science (B, P, or N) courses excluding Astronomy 100, Botany 240, Meteorology 100 and 100-level Physics courses.

III. ENGINEERING SCIENCE REQUIREMENT (23 Cr)

EMA 201	Statics	3 cr
EMA 202	Dynamics	3 cr
EMA 303	Mechanics of Materials	3 cr
EMA/ME 307	Mechanics of Materials Lab	1 cr
CS 310	Problem Solving with Computers	3 cr
CEE 310	Fluid Mechanics	3 cr
CEE 340	Structural Analysis	4 cr
CEE 395	Materials for Constructed Facilities	3 cr

IV. CIVIL ENGINEERING REQUIREMENT (14 Cr)

ME 170	Civil Engineering Graphics	2 cr
CEE 251	Engineering Spatial Measurements	2 cr
CEE 311	Hydroscience	3 cr
CEE 330	Soil Mechanics	4 cr
CEE 370	Transportation Engineering	3 cr

V. APPLIED ENGINEERING REQUIREMENT (39 cr) (Please note: Applied Engineering Requirements differ from those for the CEE degree)

Applied Engineering requirements consist of 3 categories: (1) management, (2) engineering, and (3) technical electives. A MINIMUM of 9 credits of construction management and 12 credits of design engineering are required.

Under the "Engineering" category, students are required to take 2 terms1-credit each either through summer internships or co-ops (where a summer internship equals 1 credit and a co-op equals 1 credit) and a 4 credit senior-level capstone design course. The other seven credits can be used to take engineering subjects such as concrete, foundations, steel, woods, retaining structures, etc.

Under the "Management" category, students MUST take CEE 491 Legal Aspects of Engineering, CEE 492 Integrated Estimating and Scheduling, and CEE 498 Construction Project Management. At most, 9 credits can be taken outside of CEE to meet the construction management requirements.

The specific courses for the construction management and design engineering categories are listed in Part 2 of the CEM curriculum.

Technical Electives (6 cr)

- a) Technical Elective in the College of Engineering 3 cr
- b) Technical Elective in the College of Engineering from a degree granting department outside the Civil & Environmental Engineering Department (ME 361 Thermodynamics or ECE 376 Electrical and Electronic Circuits recommended) 3 cr

27 credits in this section must be listed as Civil and Environmental Engineering (CEE) Courses.

Notes for use in planning course selection to satisfy the Applied Engineering Requirement:

1. Courses carrying the Timetable L&S breadth requirement designation of H, L, S, or Z may not be used to satisfy the Applied Engineering Requirement unless otherwise noted in the curriculum.
2. "Technical Elective Courses" include:
 - a) courses in the College of Engineering that do not carry social science or humanities credit; (at most one course can be from EPD). Inter Eng 160 is equivalent to a course from EPD.
3. A student graduating with a civil engineering degree must have 16 or more design credits, and should use the list entitled "Design Credits in CEE Courses" to select courses.* At least one CEE senior-level design course containing 3 design credits and marked on the "Design Credits in CEE Courses" list as senior-level design must be taken. Up to 3 of the design credits for courses taken in the Applied Engineering category may be taken in the College of Engineering outside of CEE. The criteria for determining design credits for Co-op, Special Topics, Practicum and Independent Study courses should be based on the document approved September 7, 1993 by the CEE faculty entitled "Design in the Civil Engineering Curriculum". A copy of the student's Engineering Coop (CEE 001) report must be placed in the student's file if design credits are taken.

*A Design Credits list is available in the CEE Department Office and is applicable for the semester and year stated on the list.

VI. COMMUNICATIONS SKILLS (5 cr)

Please note: Communication skills requirements differ from those for the CEE degree.

All students entering as freshmen in the Fall 1996 must satisfy the Communication Skills - Part A of the UW General Education Requirements.

Students who do not test out of Part A Communication Skills must satisfy the requirement by taking one of the following courses. Credits earned for taking any of the courses listed will not count toward the necessary 127 credits required to graduate.

EPD 155*	Basic Communication
Ag Jour 100	Intro to Communication
Com Arts 100	Introduction to Speech Composition
English 100	Freshmen Composition
English 118 ESL	English Composition
ILS 200	Critical Thinking & Expression

*EPD 155 is recommended

Communication Skills courses must be selected from the list below. A speech-related and writing-related course are required.

Speech-Related Courses

EPD 275*	Technical Presentations	2 cr
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EPD 275 is *required* by the Construction Engineering and Management Program Option to fulfill the requirement for a speech-related course. The following courses are acceptable, only if taken before entering the CEM program option:

Com Arts 101	Fundamentals of Speech	3 cr
Com Arts 105	Public Speaking	2 cr
Com Arts 181	Elements of Speech (Honors)	3 cr
Com Arts 262	Theory & Practice of Argumentation and Debate	3 cr
Com Arts 266	Theory & Practice of Group Discussion	3 cr

Writing-Related Courses (Satisfies Communication Skills - Part B - UW General Education Requirement)

EPD 397*	Technical Writing	3 cr
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EPD 397 is *required* by the Construction Engineering and Management Program Option to fulfill the requirement for a writing-related course. The following courses are acceptable, only if taken before entering the CEM program option:

English 105	Expository Writing	3 cr
English 201	Intermediate Composition	3 cr
English 203	Creative Writing	3 cr
English 315	Advanced Expository & Critical Writing	3 cr

EPD 275 and 397 are recommended and also count toward the Technical Communication Certificate.

Note: It is suggested that students consider pursuing a communication certificate. The 24-credit Technical Communications Certificate (TCC) consists of 9 credits in Technical Proficiency courses and 15 credits in Technical Communication courses, providing fundamental concepts and practical applications. Students who complete the certificate will have the notation "Technical Communication Certificate" added to their transcripts. The Technical Communication Certificate is offered by the Department of Engineering Professional Development (EPD), 420 Henry Mall, Tel: 608/262-2472, E-mail: tc@tc.engr.wisc.edu

VII. LIBERAL STUDIES REQUIREMENT (16 Cr)

For purposes of this curriculum, liberal studies courses are courses that have a Timetable L&S breadth requirement designation of H, L, S, or Z. EPD 101 is also considered a liberal studies course.

At least 16 credits must be selected as follows:

1. An economics course selected from the following list:

Econ 101, Principles of Microeconomics, 4 cr
Econ 102, Principles of Macroeconomics, 3 cr
Econ 111, Principles of Economics — Accelerated Treatment, 4 cr.

2. An environmental issues course selected from the following list:

Envir St 112, Environmental Studies: The Social Perspective, 3 cr, S-E
Envir St 113, Environmental Studies: The Humanistic Perspective, 3 cr, H-E
Envir St/Geog 139, Resources and People, 3 cr, S-E
Envir St 307, Literature of the Environment: Speaking for Nature, 3 cr, L-I
Envir St/Geog 309, People, Land, and Food: Comparative Study of Agricultural Systems, 3 cr, S-I
Envir St/Geog 339, Environmental Conservation, 4 cr, S-I
Envir St/Econ 343, Environmental Economics, 3 cr, S-I
Envir St 440, Environmental Decision-Making, 3 cr, S-I
Envir St/Philos 441, Environmental Ethics, 4 cr, Z-A
Envir St/Poly Sci 448, Energy Policy and Politics, 3-4 cr, S-D
Envir St/Urb R PI/Econ/Poly Sci 449, Government and Natural Resources, 3-4 cr, S-D
Envir St/Philos 453, Aesthetics of the Natural Environment, 3 cr, H-D
Envir St/History/Geol 460, American Environmental History, 3 cr, Z-I
Envir St/Anthro 477, Anthropology, Environment, and Development, 3 cr, S-I
Envir St/History 497, A natural History of Man, 3-4 cr, S-I
Envir St/Geog 537, Culture and Environment, 4 cr, S-A
Envir St/History 644, Mankind in the American Environment, 3-4 cr, S-I
Envir St/Urb R PI 668, Green Politics: Global Experience, American Prospects, 3 cr, S-D

3. An ethnic studies course. Ethnic Studies courses are identified in the Timetable as courses that count toward the L&S Ethnic Studies Requirement.
4. Six or more credits must be selected from one department, with at least one course having Timetable course level destination of I, D, or A.
5. At least six credits of the liberal studies courses must have a Timetable L&S breadth designation of H, L, or Z. (Effective Fall, 1996 for entering freshmen).
6. Students interested in the general building application area should refer to part 2 of the CEM curriculum for some suggested courses that will fulfill some of the liberal studies requirements.
7. Students interested in the transportation application area should refer to part 2 of the CEM curriculum for some suggested courses that will fulfill some of the ethnic studies and liberal studies requirements.
8. Foreign language courses are considered to have a breadth designation of H. Retrocredits, which are credits awarded by foreign language departments for successful completion of a higher level course, do not count toward the total credits (16 cr) and do not count as part of the minimum six credits of H, L or Z. Retrocredits may be used to satisfy the depth requirement (#6 – I, D, or A level) if

the credits were given an intermediate or higher level designation. Foreign language credits taken to make up a high school deficiency for campus entrance may not be used.

Note: The Civil Engineering profession and the design/construction industry is evolving to a global practice. It is strongly suggested that students take a foreign language and become, if possible, bilingual. It is also suggested that students, to the extent available and possible, study abroad to Experience first-and the practice of design/construction and a different culture.

**CIVIL ENGINEERING
UNDERGRADUATE CURRICULUM
(CONSTRUCTION ENGINEERING and MANAGEMENT OPTION)**

Suggested 8-Semester Course Sequence

1st Semester

Math 221	5 cr
ME 170	2 cr
Chemistry 109	5 cr min
Geology 100/101/106 Elec.	3 cr min
Com. Skills Part A	<u>(2 cr min)*</u>
	15 cr min.

2nd Semester

Math 222	5 cr
EMA 201	3 cr
CEE 251	2 cr
STAT 224	<u>3 cr</u>
	13 cr

3rd Semester

Math 234	3 cr
EMA 202	3 cr
EMA 303	3 cr
EMA/ME 307	1 cr
CEE 370	3 cr
Applied Engr. Elec.	<u>3 cr</u>
	16 cr

4th Semester

Math 319 or 320	3 cr
CEE 310	3 cr
CEE 340	4 cr
CS 310	3 cr
EPD 397	<u>3 cr</u>
	16 cr

CEE 001 Summer Internship (Applied Engr.)

1 cr

5th Semester

CEE 311	3 cr
CEE 330	4 cr
ECON 101	4 cr
EPD 275	2 cr min
Applied Engr. Elective	<u>3 cr</u>
	16 cr

6th Semester

CEE 395	3 cr
Physics 202/208	5 cr
Applied Engr. Elec.	6 cr
Liberal Studies Elec.	<u>2 cr</u>
	16 cr

CEE 001 Summer Internship (Applied Engr.)

1 cr.

7th Semester

Liberal Studies	6 cr
Applied Engr.	<u>10 cr</u>
	16 cr

8th Semester

Liberal Studies	4 cr
Applied Engr.	<u>12 cr</u>
	16 cr

TOTAL: 126 cr min

*no degree credit

NOTE: PASS/FAIL REGULATIONS

CEE students may take courses Pass/Fail in accordance with the College of Engineering Regulations (No. 13). Up to two P/F course may count toward the CEE degree. These courses must be liberal electives only and do not include the required ECON 101 (or equivalent) or the required Environmental Issues course.

Design Credits Worksheet

A student graduating with a civil engineering degree must have 16 or more design credits, and should use the lists entitled "Design Credits in CEE Courses" to select courses. At least one CEE senior-level design course containing 3 design credits must be taken. Up to 3 of the design credits for courses taken in the Applied Engineering category may be taken in the College of Engineering outside of CEE. The criteria for determining design credits for Co-op, Special Topics, Practicum and Independent Study courses should be based on the document approved September 7, 1998 by the CEE faculty entitled "design in the Civil Engineering Curriculum" (See *Advisor's Handbook*, Section 7.2). A copy of the student's Engineering Coop (CEE 001) report must be placed in the student's file if design credits are taken.

Advisor's must take special care to check design credits that were in effect for courses during the semester they were taken.

Entries in the table below should include both required and elective courses.

Course Number	Course Credits	Semester Taken	Number of Design Credits
CEE 251	2		
CEE 311	3		
CEE 330	4		
CEE 340	4		
CEE 370	3		
CEE 395	3		
CEE 578	4		
			Total Design Cr. =