

# Curriculum Guide Civil Engineering: Construction Management Option

## **Mission of Civil and Environmental Engineering (CEE) Undergraduate Program**

*Our mission is: To create, integrate, and transfer civil and environmental engineering knowledge and practice, and to develop future citizens, civil engineering professionals and leaders for this state and nations of the world.*

## **Student Responsibilities for Academic Advising**

- ▶ Seek advising when needed and accept responsibility for accomplishing your academic goals
- ▶ Understand prerequisite requirements and plan accordingly
- ▶ Monitor the academic calendar and meet all deadlines
- ▶ Start a file for all paperwork you receive from the university. SAVE everything!
- ▶ Complete CEE Advising Preparation form (Forms can be picked up outside of room 2205 Engineering Hall)
- ▶ Bring two copies of your DARS report to every advising appointment (Request your DARS report at least 48 hours before your appointment)

**Objectives of the CEE Undergraduate Program:**

**Prepare students for professional success in civil and environmental engineering by;**

1. providing a comprehensive education in the fundamentals of civil and environmental engineering,
2. developing teamwork and communications skills required for multi-disciplinary civil and environmental projects and for successfully contributing to the improvement of society,
3. providing experiences to develop leadership, citizenship, and professionalism,
4. providing experiences in realistic civil and environmental engineering design and construction practice, and
5. continually improving programs and facilities to ensure responsiveness to the needs of civil engineering practice and society.

**Important Contact Information:**

**Department of Civil and Environmental Engineering**

**Chair- Jeffrey Russell**

russell@engr.wisc.edu

262-7244

2205 Engineering Hall

**Senior Administrative Program Specialist- Marsha Landretti**

landretti@engr.wisc.edu

262-7812

2208 Engineering Hall

**Student Services Coordinator/Academic Advisor- Abby Dawes**

aedawes@wisc.edu

890-0864

2205 Engineering Hall

**Civil and Environmental Engineering Department Office-2205 Engineering Hall**

**CEE Department Homepage: <http://www.engr.wisc.edu/cee/>**

**The following forms can be found online at: <http://www.engr.wisc.edu/cee/current/>**

- 1) Approval to Add a Closed CEE Course Form
- 2) Course Change Form
- 3) Course Substitution Form

**1. MATH/STATISTICS REQUIREMENT (19 Cr)**

Math 221	Calculus & Analytical Geometry	5 cr
Math 222	Calculus & Analytical Geometry	5 cr
Math 234	Calculus & Analytical Geometry	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 math 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/ME307	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 terms I-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).
  - b) 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
Corn 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 both 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:

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

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

EPD397*	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 -1. 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, bi-lingual. 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.

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING SCHOLASTIC  
RECORD - CONSTRUCTION ENGINEERING & MANAGEMENT OPTION

Student's Name \_\_\_\_\_

ID Number \_\_\_\_\_

Home Address \_\_\_\_\_

Math & Statistics (16)			Civil Engineering (14)				Communication Skills (5)		
	CR	Grade		CR	Grade		CR	Grade	
Math 221	5		ME 170	2		Gen Ed.-Part A	-		
Math 222	5		CEE 251	2		Speech (EPD 275)	2		
Math 234	3		CEE 311	3					
Math 319 or 320	3		CEE 330	4		Writing/Gen Ed. (EPD 397)	3		
Statis. 224	3		CEE 370	3					
Nat. Sci. (13)									
	CR	Grade							
Phys 202/208	5		Management (9)*	Design Cr	CR	Grade	Liberal Studies (16)		
Chem 109	5		CEE 491		3		T	CR	
			CEE 492		3				
Geol. 100,101 or 106	3/5		CEE 498		3		Econ 101/102/111	3/4	
							Env. Studies		
Engineering Science (23)							Ethnic Studies		
	CR	Grade					H,L or Z (6)		
EMA 201	3						1.		
EMA 202	3		Engineering (12)*				2.		
EMA 303	3		CEE 001 Internship/Coop		1				
EMA/ME 307	1		CEE 001 Internship/Coo		1		One Dept (6)		
CompSci 310	3		CEE 578 Sr. Design	3	3		I, D, or A (3)		
CEE 310	3						1.		
CEE 340	4						2.		
CEE 395	3								
			Tech(6)				Other		
			Engr (Not CEE) (3 credit min.)				CR	Grade	

Recording Grades:

- A. Transfer Credits: enter CR
- B. U.W. Madison Credits: enter letter grade

Advisors: From: \_\_\_\_\_  
From: \_\_\_\_\_

\*Sub-Options "Construction Management" and "Design Engineering" both require a minimum of 9 credits of Construction Management and 12 credits of Design Engineering.

**Effective Spring, 2003**

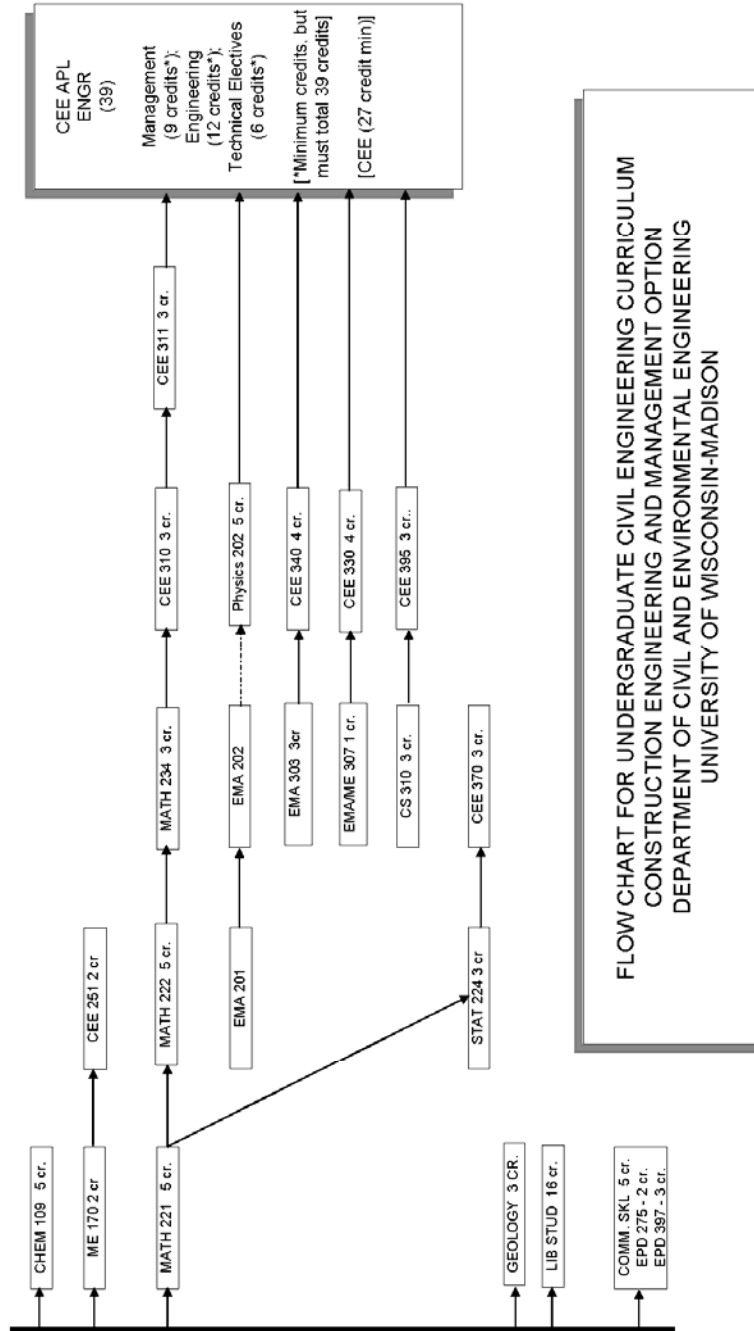
## Design Credits Worksheet

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.

Advisors 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		
			<b>Total Design Cr. =</b>



## CEE Construction Engineering and Management Option

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 2**

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

Part 2 is a supplement to the Curriculum in Civil and Environmental Engineering for the degree of bachelor of Science—Civil Engineering. Construction Engineering and Management Option.

The purpose of this supplement is to assist students in planning their applied engineering requirements and their liberal studies. This is meant to be advisory to students and is NOT a requirement. A MINIMUM of 9 credits of construction management and 12 credits of design engineering are required. A student does not have to declare a suboption, but recommended options are shown below.

Sub-Options	Emphasis	Applied Engineering Recommendations		
		Management	Engineering	Technical Electives
Management	General Building	21	12	6
	Transportation Mgmt. & Policy			
Engineering	General Building	9	24	6
	Transportation			

There are 2 sub-options: (1) Construction Management and (2) Design Engineering. Within each sub-option, the courses are organized within 2 application areas: (1) general building and (2) transportation. These course listings are intended to assist students in the course selection process. A student may choose any construction management or design engineering course from the lists below.

The minimum requirements are 9 credits of construction management and 12 credits of design engineering. Students are required to take 2 1-credit summer internships or co-ops and a 4 credit senior-level capstone design course.

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

**Management** (minimum 9 credits)

**General Building Application** Area—commercial buildings, offices, stores, educational facilities, government buildings, hospitals, medical facilities and hotels:

CEE 290	Construction Systems	3cr
CEE 491*	Legal Aspects of Engineering	3cr
CEE 492*	Integrated Project Estimating and Scheduling	3cr
CEE 498*	Construction Project Management	3cr
CEE 592	Construction Labor Productivity Management	3cr
CEE 595	Planning/Design/Construction Integration	3cr
CEE 596	Constructability Analysis	3cr
<b>CEE 597</b>	Construction Operation Analysis	3cr

## CEE Construction Engineering and Management Option

CEE698 Special Topics in CEM 1-4cr  
*(CEE 698 may be accepted as a management course for BSCE degree depending on the topic for the semester in question.)*

ACCTIS300	Accounting Principles	3cr
GEN BUS 301	Business Law	3cr
FINANCE 300	Introduction to Finance	3 cr
MHR 300	Organizational Behavior	3 cr
REAL EST 611	Residential Property Development	3 cr
ETD 221	Interior Environments and Human Behavior	3 cr
ETD 323	Computer-Aided Design: Architecture and Interiors	3 cr
ETD 635	Building Evaluation: Behavioral Perspectives	3cr

ETD = Department of Environment, Textiles, and Design

•Students must take CEE 491 Legal Aspects of Engineering, CEE 492 Integrated Project 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.

## CEE Construction Engineering and Management Option

**Transportation Management and Policy Area**—planning, design, operation and management of transportation facilities.

CEE 491 *	Legal Aspects of Engineering	3 cr
CEE 492*	Integrated Project Estimating and Scheduling	3 cr
CEE 494	Civil & Environmental Engineering Decision Making	3 cr
CEE 495	CEE Systems Modeling Techniques	3 cr
CEE 498*	Construction Project Management	3 cr
CEE 570	Environmental Impacts of Transportation Systems	3 cr
CEE 591	Quality Control and Assurance	3 cr
CEE 679	Special Topics in Transportation and City Planning	3 cr
CEE 694	Management of Civil Infrastructure Systems	3 cr
CEE 698	Special Topics in CEM	1-4 cr

*(CEE 679 and 698 may be accepted as a management course for BSCE degree depending on the topic for the semester in question.)*

ACCT IS 300	Accounting Principles	3 cr
ACCT IS 304	Government Accounting	2 cr
EPD 453	Value Engineering	1 cr
IE 313	Engineering Economic Analysis	3 cr
IE 513	Analysis of Capital Investments	3 cr
MHR 300	Organizational Behavior	3 cr
OIM 444	Economics of Transportation	3 cr
Poli Sci 213	Urban Politics	4 cr
Poll Sci 219	Introduction to Public Policy	4 cr
Poll Sd 443	Public Administration	4 cr
Poli Sci 461	Organizational Theory and Practice	3-4 cr
Tran PU 478	Urban Transport Economics	3 cr
Tran PU 641	Transportation in Economic Development	3 cr
URPL 305	Introduction to the City	3-4 cr
URPL 306	The Real Estate Process	3 cr
URPL 312	Regional Development & Planning	3 cr
URPL 420	Urban and Regional Economics	3 cr
URPL 449	Government & Natural Resources	3-4 cr
URPL 520	Community Economic Analysis	3 cr
URPL 601	Site Planning	--

\*Students must take CEE 491 Legal Aspects of Engineering, CEE 492 Integrated Project 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.

Note: It is suggested that students consider pursuing a Certificate in Business (CIB). Course requirements add up to 18 credits in business courses. Students who complete the certificate will have the notation "Certificate in Business" added to their transcripts. See the School of Business, Undergraduate Office, 2265 Grainger Hall, Tel. 608/262-0471, E-mail: uwmadugs@bus.wisc.edu

## CEE Construction Engineering and Management Option

**Engineering (minimum 12 credits) (Geotechnical, Geographic Information Systems, Materials, Structural and Transportation)**

**General Building Application Area**—commercial buildings, offices, stores, educational facilities, government buildings, hospitals, medical facilities, and hotels.

CEE 001**	Summer Internship/Cooperative Education Programs	2-3 credits
CEE 440	Structural Analysis II	3 cr
CEE 442	Wood Structures I	3 cr
CEE 445	Steel Structures I	3cr
CEE 447	Concrete Structures I	3 cr
CEE 449	Structural Systems	4 cr
CEE 496	Electrical Systems for Construction	3 cr
CEE 497	Mechanical Systems for Construction	3 cr
CEE 531	Retaining Structures	3 cr
CEE 545	Steel Structures II	3 cr
CEE 547	Concrete Structures II	3 cr
CEE 578**	Senior Capstone Design	4 cr
CEE 543	Prestressed Concrete	3 cr
CEE 649	Special Topics in Structural Engineering	1-4 cr
CEE 698	Special Topics in Construction Engineering and Management	1-4cr

\*\*The Construction Engineering and Management (CEM) Program Option requires a minimum of 2 one-credit summer internships or co-ops and a 4-credit senior capstone design course.

**Transportation Engineering Area**—airports, bridges, roads, canals, locks, dredging, marine facilities, piers, railroads, and tunnels.

CEE 001 **	Summer Internship/Cooperative Education Programs	2-3 credits
CEE 301	Introduction to Aerial Photographic Systems	1 cr
CEE 302	Intro. to Electro-optical and Microwave Remote Sensing Systems	1 cr
CEE 303	Introduction to Remote Sensing Digital Image Processing	1 cr
CEE 304	Remote Sensing Visual Image Interpretation and GIS Integration	1 cr
CEE 403	Geometric Analysis of Vertical Aerial Photographs	1 cr
CEE 457	Route Location	3 cr
CEE 530	Seepage and Slopes	3 cr
CEE 531	Retaining Structures	3 cr
CEE 532	Foundations	3 cr
CEE 556	Remote Sensing Digital Image Processing	3 cr
CEE 571	Urban Transportation Planning	3 cr
CEE 573	Geometric Design of Transport Facilities	3 cr
CEE 574	Traffic Control	3 cr
CEE 575	Advanced Highway Materials and Construction	3 cr
CEE 576	Advanced Highway Design	3 cr
CEE 578**	Senior Capstone Design	4 cr
CEE 670	Transit Systems Planning	3 cr
CEE 639	Special Topics: Geotechnical	3 cr
CEE 641	Highway Bridges	3 cr
CEE 649	Special Topics in Structural Engineering	1-4 cr
CEE 655	Computerized Land Information Systems	3 cr
CEE 659	Special Topics: Surveying & Photogrammetry	2 cr
CEE 679	Special Topics: Transportation	3 cr
CEE 695	Design and Construction of Bituminous Mixtures	3 cr
CEE 698	Special Topics in Construction Engineering and Management	1-4 cr
CEE 795	Characterization of Asphalt Binders	3 cr

\*\*The Construction Engineering and Management (CEM) Program Option requires a minimum of 2 one-credit summer internships or co-ops and a 4-credit senior capstone design course.

## CEE Construction Engineering and Management Option

**VII. LIBERAL STUDIES REQUIREMENT (16 Cr)**

*Students interested in the **GENERAL BUILDING APPLICATION** area should consider the following courses to meet their liberal studies requirements. See Part I for details.*

Art History 208 Western Architecture: Renaissance to Modern. II or S3; 4 cr (H-E). A chronological survey of the development of European architecture from the early fifteenth century to the twentieth. P: Open to Fr.

Art History 319 Gothic Architecture. II or SS; 3 cr(H-I). Architectural development! nt he high Middle Ages. P: So st or cons inst.

Art History 347 Baroque Architecture. II or SS; 3-4 cr (H-I). Architecture in Italy, France, and Spain from the Late sixteenth century through the seventeenth. P: So st or cons inst.

Art History 348 European Architecture: The Eighteenth Century. II or SS; 3-4 cr (H-I). Architecture of the 18th century in England, France, Spain, Italy, and Germany. P: So st or cons inst.

Art History 349 The Architecture and Art of Cuba. Irr.; 3 cr (H-I). A history of the architecture and art of Cuba from 1519 to the present. P: Cons inst.

Art History 357 European Architecture: The Nineteenth Century. II or SS; 3-4 cr (H-I). Architecture of the 19th century in France, Britain, Germany, and Spain. P: So st or cons inst.

Art History 358 European Architecture: The Modern Movements. II or SS; 3-4 cr (H-I). Major architectural trends in Europe from 1900 to 1939. P: So st or cons inst.

Art History 367 American Architecture: Colonial and Federal. II or SS; 3-4 cr (H-f). American architecture from the sixteenth through the early nineteenth centuries, covering English, Spanish, Dutch and French colonial styles and the Federal period. P: So st or cons inst.

Art History 368 American Architecture: The 19th Century. II or SS; 3-4 cr (H-I). Major architects and trends in American architecture from the Greek Revival to the Chicago School. P: So st or cons inst.

Art History 369 American Architecture: The 20th Century. II or SS; 3-4 cr (H-I). Major architects and trends in American architecture from 1900 to the present. P: So st or cons inst.

Art History 467 Form and Content in American Architecture: 1855-1900. II or SS; 3-4 cr (H-D). A study of the sources and the development of architecture in the United States during the second half of the nineteenth century. P: Jr st & one crse in architect hist or cons inst.

Art History 468 Frank Lloyd Wright. II or SS; 3-4 cr (H-D). An analysis of Frank Lloyd Wright's architecture and writings. P: Jr st & one crse in architect hist or cons inst.

Other courses to consider:

History of Science 222 Technology and Social Change in History. 3 cr (H-I). Topics in the history of technology of interest to students in engineering and physical sciences. Themes include the social basis of technical change, the impact of technology on everyday life, and ethical issues in technology in the last two centuries. P: Open to Fr.

## CEE Construction Engineering and Management Option

Students interested in the TRANSPORTATION APPLICATION area should consider the following courses to fulfill some of the ethnic studies and liberal studies requirements.

ETHNIC STUDIES

Anthro 104 Cultural Anthropology and Human Diversity. I, II, SS; 3 cr (e-S-E). Introduction to cultural anthropology for non-majors; comparative cross-cultural consideration of social organization, economics, politics, language, religion, ecology, gender, and cultural change. P: Open to Fr. Not for cr for those who have taken Anthro 204.

PolySci 230 Politics in Multi-Cultural Societies. I or II or SS; 4 cr (e-S-I). Race, ethnicity, and religion as political factors; cultural pluralism, politics, and policy in the United States and selected other multicultural politics. P: Open to Fr.

Poly Sci 430 Ethnic Politics in America. I or II or SS; 3-4 cr (e-S-D). A survey of the political effects of the immigration experience, ethnic mobilization and community-building in America, and the contemporary role of ethnicity in politics. P: Jr st.

Soc 215 Gender and Work in Rural America. (Crosslisted with Rur Soc, Women St) II; 3 cr (S-I). Sociological dimensions of men's and women's work in nonmetropolitan areas of the United States. Examines gender divisions of "work" in its fullest sense: paid work in formal and informal economies, self-employment, and nonmarket work such as housework. P: Open to Fr.

Soc 217 The Political Economy of Rural America. (Crosslisted with Rur Soc) II or SS; 3 cr (S-E). Provides an understanding of how national and international trends affect rural communities and development strategies. Examines the diversity in rural America by considering its basic industries, and explores the problems for rural development in these settings. P: Open to Pr.

Soc 220 Ethnic Movements in the United States. (Crosslisted with Asian Am) I or II or SS; 3-4 cr (b-e-S-I). Sociological analysis of historical and recent ethnic/racial conflict and movements in the U.S., including the relations between European Americans, Africal Americans, Mexican Americans, Native Americans, and Asian Americans, with additional material on other groups and relations. P: So st.

Soc 577 Blacks in Cities. (Crosslisted with Afroamer) II or SS; 3 cr (e-S-A). Urbanization of Black Americans. Focus on Blacks in antebellum cities, migration of Black population, residential distribution, emerging demographic trends, strategies for Black survival in today's cities. P: Jr st.

LIBERAL STUDIES

Corn Arts 272 Introduction to Interpersonal Communication. Irr.; 3 cr (b-S-E). Survey of concepts, theories, and research concerning verbal and nonverbal communication in interpersonal settings. Application of theory in practical situations, leading to development of the students' skills of analysis and performance. P: Open to Fr. Stdts may not receive credit for both Corn Arts 276 & 272.

Corn Arts 371 Communication and Conflict Resolution. I or II; 3 cr (S-I). Examines intra-and interpersonal theories of the causes and functions of conflict. Focuses on message strategies for conflict resolution and/or management. Both theoretical and applied issues. P: So st.

Corn Arts 410 Miscommunication. I, II; 3 cr (S-I). Problematic aspects of miscommunication in the study of face-to-face interaction. Course helps explain why people often have so much difficulty understanding the intentions, interpretations, and meanings of other people's actions.

## CEE Construction Engineering and Management Option

Econ 315 Labor Problems. (Crosslisted with Ind Rel) I, SS; 3-4 cr (S-I). Problems of labor with special regard to the group organizations of labor and management, their interrelations and relations to government. P: One intro econ crse & So st.

Econ 325 Public Utilities. (Crosslisted with Tran P U) I, SS; 3 cr(S-I). Development of public utilities in the U.S.; evolution of public utility concept and emerging role of regulation; regulatory and public policy issues with emphasis on the pricing of utility services; relation of environmental and conservation goals to economic objectives of public utility sector. P: Econ 101.

Econ 352 Role of Government in the Economy. II or SS; 3-4 cr (S-I). Government activities affecting business; emphasis on the economist's view of the appropriate role of the state. Such policies as antitrust, control of competitive practices, regulation, public expenditures, subsidy, transfer payments and public enterprise. P: Econ 101 or 111 or equiv, or cons inst.

Econ 420 Urban and Regional Economics. (Crosslisted with Real Est, Urb R PI) I; 3 cr (S-A). Nature and structure of urban economies; location of economic activity; economic analysis in an urban framework; principles of urban economic development, housing, transportation, poverty and unemployment and municipal finance. Forecasting of economic activity using census and socioeconomic data. P: Econ 101.

Geog 101 Introduction to Cultural Geography. I, SS; 3 cr (b-S-E). Effects of demographic characteristics, resource potentialities and cultural resources upon the growth, distribution, density, and settlement forms of the world's population. P: Open to Fr.

Geog 305 Introduction to the City. (Crosslisted with Urb R PI) I or II or SS; 3-4 cr (S-I). Analysis of the distributions of cities, their functions, character and relationships with their surrounding regions, and the areal patterns within cities; the spatial variation of population, economic activity, and land uses. P: So st; qualified Fr admitted with cons inst.

Geog 312 Regional Development and Planning. (Crosslisted with Urb R PI) I, SS; 3 cr (S-I). Analysis of the human organization of the environment and an evaluation of those principles of regional science which have been developed to promote more desirable forms of spatial organization. P: So st.

Geog 505 Urban Spatial Patterns and Theories. (Crosslisted with Urb R PI) II or SS; 4 cr (S-A). Various urban empirical regularities and theories which explain them. P: Geog 305 or cons inst.

Geog 506 Historical Geography of European Urbanization. (Crosslisted with Urb R PI) II or SS; 3 cr (S-A). Changes in the morphology, functions, and arrangements of towns and cities from the urban revolution in the ancient Middle East to the Industrial Revolution in nineteenth century western Europe and America. P: Jr st.

Geog 519 Environmentalism, Environment and the Quality of Life. II or SS; 3 cr (S-A). Defines and examines the meaning of concepts such as quality of life, quality of the environment, and evaluates the usefulness of the environmentalist perspective to planning. P: Jr st.

## CEE Construction Engineering and Management Option

IES 112 Environmental Studies: The Social Perspective. II; 3 cr. (S-E). Importance of social factors in the generation and resolution of complex environmental problems with an interdisciplinary perspective. Comparison of specific communities in the more and less developed areas of the world. P: Open to Fr.

IES 441 Environmental Ethics. (Crosslisted with Philos) or SS; 4 cr (Z-A). Adequacy of ethical theories in handling such wrongs as harm to the land, to posterity, to endangered species, and to the ecosystem itself. Exploration of the view that not all wrongs involve harm to humans. Inquiry into the notion of the quality of life and the ethics of the "lifeboat" situation. P: 3 cr philos or enviro studies, or Grad st in IES.

IES 449 Government and Natural Resources. (Crosslisted with Urb R PI, Econ/Poli Sci) SS; 3-4 cr (S-D). Problems of public policy and administration for development and use of natural resources. P: Jr st.

Journ 614 Communication and Public Opinion. I, SS; 4 cr (S-A). The role of the mass media of communication in the formation of public opinion. Propaganda goals of government, political, economic, and social groups. P: Sr st.

Poli Sci 104 Introduction to American Politics and Government I, SS; 4 cr (S-E). Basic institutions and processes of American government. The role of constitutional structures, parties, interest groups and elections in the system; policy formation and policy comment. P: Open to Fr & So only. Not open to stdts who have had Poli Sci 182, 184, or 404.

Poli Sci 205 Introduction to State Government. I or II or SS; 4 cr (S-I). Basic institutions and processes of state government in the United States; the role of parties, pressure groups, and elections in the system; the policy process, its outputs and outcomes; the role of states in the federal system, and the diversity of state politics and policy. P: Previous poli sci course recommended, or cons inst; not to be taken after Poli Sci 405 Open to Fr.

Poli Sci 405 State Government and Public Policy. I or II or SS; 3-4 cr (S-D). The structure of state government and the politics of public policy-making in the fifty states. P: Jr st with a prev crse in poli sci. Poli Sci 205 recommended.

Poli Sci 413 Problems of Urban Areas. I or II or SS; 3-4 cr (e-S-D). Urban political process as it relates to such problems as housing and urban renewal planning, law enforcement, poverty, education and transportation. P: Jr st or cons inst.

Poli Sci 441 Business and Government in the U.S. I, SS; 3-4 cr (S-D). Examination of the political power of business; methods used to influence government and the public; government goals and business influence in specific policy areas such as taxation, health care, regulation, trade, labor relations, industrial policy. P: Poli Sci 104 or 182 or 404.

Poli Sci 444 Administration of Public Policy. I or II or SS; 3-4 cr (S-D). The contribution of administrative personnel and institutions to the formulation, adoption, and implementation of major domestic programs. P: Jr st & Poli Sci 104 or 404; or cons inst.

Poli Sci 472 Politics of Pressure Groups. I or II or SS; 3-4 cr (S-D). Internal politics of labor unions, business and professional associations, and farm groups; techniques employed in advancing their policies in government. P: Jr st & Poli Sci 104 or 404; or cons inst.

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Poll Sci 473 Public Opinion. I or II or SS; 3-4 cr (S-D). Formation of opinions within and among the political publics; their role in the development and practice of governmental policy. P: Jr st. Poll Sci 475 Policy Making in the American States. I or II or SS; 3-4 cr (S-D). The measurement and quantitative analysis of public policies offered in the American states, together with the societal, economic, and political features of the states which affect policies and feel their impact. P: Jr st.

Poll Sci 512 Science and Government. (Crosslisted with Envir St. Geology) I or II or SS; 4 cr.(S-I). The effect of science and technology on demands for decisions of public policy related to theory of the role of government. P: Cons inst.

Polic Sci 530 Ethics and Values in Policy Making. (Crosslisted with Pub Affr) I or II or SS; 3-4 cr (S-D). The consideration of rival judgments about desirable public purposes and the justification of policy decisions. Deliberation of principles and values that may be used in identifying public problems, defining the objectives and constraints of policy, and arguing for preferred solutions. Appraisal of the success or failure of policy, the use of norms and standards in assessing the consequences of public action. P: Jr st or cons inst. Prior crse in political theory, philos, or public admin recommended.

Rur Soc 140 Introduction to Rural Sociology. (Crosslisted with Soc) I, SS; 3 cr (S-E). Contemporary and historical issues in rural society throughout the world, with special attention to the U.S. and less developed nations. Sociological concepts are introduced and applied to agriculture, natural resources, rural institutions, and community population changes. P: Open to All Undergrads.

Rur Soc 217 The Political Economy of Rural America. (Crosslisted with Soc) II or SS; 3 cr (S-E). Provides an understanding of how national and international trends affect rural communities and development strategies. Examines the diversity in rural America by considering its basic industries, and explores the problems for rural development in these settings. P: Open to Fr.

Rur Soc 617 Community Development. (Crosslisted with Soc, Urb R PI) II or SS; 3 cr (S-A). Social, cultural and personality factors influencing community development, with reference to developing countries as well as contemporary rural communities; consideration of theoretical and operational issues. P: Jr st, intro course in sociology or cons inst.

Soc 130 Social Problems. I, SS; 3 cr (S-E). Conditions and processes in personal and social maladjustment; nature of social disorganization and social problems; their relation to social change and basic ideological, technological, and institutional structures and processes. P: Open to Fr.

Soc 536 Public Opinion. II or SS; 3 cr (S-A). Communication processes, agencies/of mass influences; analysis of symbolic processes, publics, and audiences; censorship and propaganda, their personnel and strategies. P: Jr st and intro course in soc or cons inst.

Soc 575 Sociological Perspectives on the Life Course and Aging. II or SS; 3 cr (S-A). Age as a basis of societal differentiation in modern and premodern societies; social psychological, demographic, sociobiological, socioeconomic, and sociohistorical views of age-graded events and behaviors; examination of the life course and aging as sociological variables. P: Jr st or cons inst.

Soc 617 Community Development. (Crosslisted with Rur Soc, Urb R PI) II or SS; 3 cr (S-A). Social, cultural and personality factors influencing community development, with reference to developing countries as well as contemporary rural communities; consideration of theoretical and operational issues. P: Jr st, intro course in sociology or cons inst.

Soc 632 Sociology of Organizations. I or II or SS; 3-4 cr (S-A). Sociological perspectives on the structures and processes of large-scale formal organizations in Western society; a wide-ranging examination of contemporary organizational theory and research, with illustrations from business,

## CEE Construction Engineering and Management Option

governmental, religious, military, political and educational organizations. P: Jr st & an intro crse in soc or cons inst.

Soc 677 Urbanism and Urbanization. (Crosslisted with Urb R PI) I or II or SS; 3 cr (S-A). Comparative and historical approach to cities; urban spatial structure, temporal patterns, and population characteristics; the social structure and psychological aspects of urban communities;

implications for policy and planning. P: Jr st & intro course in sociology, or cons inst.

URPL 505 Urban Spatial Patterns and Theories. (Crosslisted with Geog) II or SS; 4 cr (S-A). Various urban empirical regularities and theories which explain them. P: Geog 305 or cons inst.

URPL 617 Community Development, (Crosslisted with Rur Soc, Soc) I or II; 3 cr (S-A). Social, cultural and personality factors influencing community development, with reference to developing countries as well as contemporary rural communities; consideration of theoretical and operational issues. P: Jr st, intro course in sociology or cons inst.

URPL 464 Planning for Human Settlements in Developing Countries. II or SS; 3 cr (S-I). Human settlement planning in the context of rapid urbanization in developing countries. National and subnational planning for urban and regional development, housing, land policy, decentralization, and urban development finance. P: Jr st.

URPL 617 Community Development. (Crosslisted with Rur Soc, Soc) II or SS; 3 cr (S-A). Social, cultural and personality factors influencing community development, with reference to developing countries as well as contemporary rural communities; consideration of theoretical and operational issues. P: Jr st, intro course in sociology or cons inst.

URPL 677 Urbanism and Urbanization. (Crosslisted with Soc) I or II or SS; 3 cr (S-A). Comparative and historical approach to cities; urban spatial structure, temporal patterns, and population characteristics; the social structure and psychological aspects of urban communities; implications for policy and planning. P: Jr st & intro course in social, or cons inst.