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Details:

(FORM UPDATED: 08/11/2010)

WISCONSIN STATE LEGISLATURE ... PUBLIC HEARING - COMMITTEE RECORDS

2007-08

(session year)

Senate

(Assembly, Senate or Joint)

Committee on ... Labor, Elections and Urban Affairs (SC-LEUA)

COMMITTEE NOTICES ...

- Committee Reports ... **CR**
- Executive Sessions ... **ES**
- Public Hearings ... **PH**

INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

- Appointments ... **Appt** (w/Record of Comm. Proceedings)
- Clearinghouse Rules ... **CRule** (w/Record of Comm. Proceedings)
- Hearing Records ... bills and resolutions (w/Record of Comm. Proceedings)
(**ab** = Assembly Bill) (**ar** = Assembly Resolution) (**ajr** = Assembly Joint Resolution)
(**sb** = Senate Bill) (**sr** = Senate Resolution) (**sjr** = Senate Joint Resolution)
- Miscellaneous ... **Misc**

Plotkin, Adam

From: jsrussel [russell@engr.wisc.edu]
Sent: Tuesday, March 04, 2008 5:51 PM
To: Sen.Coggs
Cc: Sen.Grothman; Sen.Lehman; Sen.Wirch; Sen.Lasee; Sen.Plale; Sen.Cowles; Lasee, Frank; Rep.Gottlieb
Subject: Letter to Senator Coggs Regarding Assembly Bill 69

Attachments: Coggs3408.doc; CEECurriculumGuideEffectiveFall20071.pdf; CivilEngineer1.pdf



Coggs3408.doc
(337 KB)



CEECurriculumGuideEffectiveFal...



CivilEngineer1.pdf
(37 KB)

Senator Coggs:

Hello! Attached is a letter to support my testimony last week on Assembly Bill 69.

Thank you for your service to the citizens of Wisconsin.

Respectfully Yours,

jeff

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Jeffrey S. Russell, Ph.D., P.E.
Professor and Chair
Civil and Environmental Engineering
University of Wisconsin-Madison
2205 Engineering Hall
1415 Engineering Drive
Madison, WI 53706
Phone: (608) 262-7244
FAX: (608) 262-5199
E-mail: russell@engr.wisc.edu
Http: www.engr.wisc.edu/cee/faculty/russell_jeffrey.html
=====



DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
UNIVERSITY OF WISCONSIN - MADISON

1415 Engineering Drive
Madison, Wisconsin 53706

608-262-7244 (Phone)
608-262-5199 (FAX)
russell@enr.wisc.edu

4 March, 2008

Senator Spencer Coggs
Chair, Committee on Labor, Elections and Urban Affairs
Room 123 South
Capital Capitol
PO Box 7882
Madison, WI 53707-7882

Dear Senator Coggs,

Thank you for allowing me the opportunity to testify before the Committee on Labor, Elections and Urban Affairs on Wednesday, 27 February regarding Assembly Bill 69. I am writing to provide a brief summary of the points I made during my testimony.

1. The faculty of the UW-Madison Department of Civil and Environmental Engineering voted unanimously to support Assembly Bill 69. The faculty voted unanimously against Senate Amendment 1 which allows "a diploma of graduation or degree from a technical college in an engineering-related course of study of not less than 2 years."
2. A technology degree is not equivalent in terms of academic breadth, depth, and preparation to an ABET-accredited engineering degree. A simple comparison of the actual curriculum of both degree programs makes this quite clear. Please refer to the attachments that illustrate the breadth and depth of the engineering curriculum at some of the engineering programs within the University of Wisconsin System.
3. Experience is important in preparing a professional engineer but is not a replacement for fundamental knowledge in math, science, engineering science, breadth in engineering topics, breadth in humanities and social sciences, and breadth in professional practice topics. The world is simply too complex with increasing rates of technological change to expect 2 years of additional practical experience to replace fundamental knowledge that is part of formal engineering education.
4. The engineering profession is recommended education beyond the bachelor's degree. The National Academy of Engineering recently released two reports recommending that the bachelor's degree be considered a pre-engineering degree and that the master's be the entry-level degree. Furthermore, the National Council of Examiners for Engineering and Surveying (NCEES), made up of 70 licensure boards from across the country, created a Model Law that seeks to provide greater uniformity of qualifications for licensure and to raise these qualifications to a higher level of accomplishment. The Model Law is simply a consensus of what the NCEES member boards think the statutes should look like. The current Model Law requires an ABET-accredited degree in engineering or equivalent. Effective 1 January 2015, the Model Law will be changed to include the bachelor's degree plus 30 additional credits in upper-level technical and professional practice courses. The engineering profession is advocating additional education to better serve society and protect public health, safety and welfare. The education and licensure bar is being raised not lowered.

At the UW College of Engineering, we are preparing the next generation of engineers who will face a fast-paced, ever changing world. Our graduates will deal with significant challenges in areas such as energy, drinking water, clean air, safe waste disposal, transportation, and sustainability. Our students take significant coursework in the engineering sciences, and we also know they must be well-rounded in other areas such as communications, business management and public policy. I call your attention to the attached document that details the credit requirements for

receiving a degree in Civil and Environmental Engineering from UW-Madison. The coursework is challenging and demanding, with a comprehensive blend of math, statistics, engineering science, applied engineering, communications, and liberal studies. One can contrast such a rigorous regimen with sample Associate Degree programs available at the State's technical colleges. For example:

- In a two-year program at Northcentral Technical College, students can earn an Associate of Applied Science degree as an Applied Engineering Technician by completing 62 credits for graduation.

- A two-year program at the Milwaukee Area Technical College requires 70 credits for a student to receive an Associate in Applied Science degree in civil engineering technology. A similar program at Madison Area Technical College requires 68 credits for graduation.

While these technical college programs serve a distinct need, they are focusing on applied tools and strategies and do not provide the breadth and depth of knowledge and skills that an engineer must possess to successfully deal with the complex challenges facing our modern world.

In closing, the technology programs in Wisconsin make valuable contributions to our quality of life. The key issue is this: What are the key educational requirements for success in a professional whose very job has significant impacts on our collective quality of life? When one considers other disciplines, we note that a para-legal is not a lawyer, a physician's assistant is not a doctor, a licensed practical nurse is not a registered nurse. One achieves advanced levels of professional practice and accompanying licensure through a combination of higher education and real-world experience. When it comes to engineering, lowering the standard runs the risk of compromising public health, safety and welfare.

Sincerely Yours,



Jeffrey S. Russell, Ph.D., P.E., F. ASCE
Professor and Chair

Enclosures

- 1) Civil Engineering Curriculum Guide, UW College of Engineering
- 2) Curriculum outline, Civil Engineering Technology, Applied Science Degree, Madison Area Technical College

CC:

Senator Robert Wirth
Senator John Lehman
Senator Glenn Grothman
Senator Alan Lasee

Civil Engineering Curriculum Guide

Mission of Civil and Environmental Engineering (CEE) Undergraduate Program

Create, integrate, and transfer civil and environmental engineering knowledge and practice in the development of professionals, leaders, and citizens that help define and serve societal and environmental needs by applying this knowledge and practice in an effective and sustainable manner.

Educational Objectives

BSCE graduates are prepared to contribute to their communities through the following career and professional accomplishments:

- 1) plan, design, construct and manage both natural and built processes and systems to meet determined needs using technical knowledge, computer tools, and design principles with communication, leadership, and team skills;
- 2) utilize measurement and analysis tools along with experimental data in investigating natural and built systems;
- 3) understand and incorporate economic, environmental, political, social, safety and global considerations in design, investigation, and construction of natural and built systems;
- 4) enhance analysis and design tools and experience through life long learning; and
- 5) serve others through professional responsibility, leadership and participation in professional and public activities, and good citizenship.

CEE Program Outcomes

1. Evaluate constructed facilities and natural systems, structure, processes, or conditions to meet determined societal needs. Design sustainable facilities and systems to meet these needs, while protecting the environment, conserving resources, and maintaining quality of life.
2. Select and apply appropriate analyses methods to solve well-defined problems, related to civil engineering, using knowledge of mathematics, statistics, computer tools, natural and engineering sciences, material properties, and civil engineering.
3. Understand and use instrumentation and methods to obtain data, calibration and validate devices and processes, including assessment of accuracy and errors.
4. Participate in various roles of a team whose function is to define, analyze, and synthesize a solution to an open ended design problem. Understand that problems' relevant multi-disciplinary aspects and contemporary issues.
5. Understand the role of a leader and leadership principles and attitudes.
6. Prepare and present well organized written engineering solutions, designs, and plans that are appropriate for a particular audience.
7. Recognize and respond to ethical and legal, economic, health and environment, political, safety, and social factors in decisions that affect project completion, analysis, design, construction, operation, and conduct of duties.
8. Understand common failure mechanisms and analyze the failure risk or actual failure of a process or system.
9. Understand principle elements of project management, construction, and asset management and their relation to project development, operation, and maintenance. Understand fundamentals of business, public policy, and administration and their relation to project development, operation and maintenance.
10. Determine the life-cycle cost of a process, component, or system and perform basic analyses of alternative, feasible solutions for a project.
11. Recognize the need and plan to engage in life-long learning.

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!**
- **Bring a copy of your DARS report to every advising appointment**

General College Requirements	21 Credits*
CEE Requirements	106 Credits
Math and Statistics Requirement	9
Natural Sciences Requirement	11
Engineering Science Requirement	17
Civil Engineering Requirement	18
Applied Engineering Requirement	30
Communication Skills Requirement	5
Liberal Studies Requirement	16
Total Credits	127

General College Requirements

General Education Communication Skills – Part A
 Math 221 (or 217 or 275)
 Math 222 (or 276)
 EMA 201 or Physics 201
 Chem 109 or Chem 103/104
 Introduction to Engineering

*The General College Requirements (GCR) may be satisfied by a number of different courses depending on the student's background and interest. As a result, the number of credits taken as part of the GCR may vary from a minimum of 21 to maximum of 29 depending on the selection of courses.

The CEE Department offers three undergraduate options programs: Construction Engineering Management (CEM), Environmental Engineering (EE) and Fluid Systems Engineering (FSE). Once students have been accepted to the CEE Department they may choose to apply to one of the option

programs. Option programs are not required. For more information or to apply to an option, please see Abby Dawes in 2205 EH.

Important Contact Information

Chair- Jeffrey Russell Office: 2205 Engineering Hall (EH)
russell@engr.wisc.edu (608) 262-7244

Senior Administrator- Marsha Landretti Office: 2208 EH
landretti@engr.wisc.edu (608) 262-7812

Student Services Coordinator- Abby Dawes Office: 2205 EH
adedawes@wisc.edu (608) 890-0864

Pass/Fail Regulations

Up to two Pass/Fail courses may count towards the CEE degree. These courses MUST be liberal studies electives and do not include the required ECON 101 (or equivalent) or the required Environmental Issues Course. CEE students must take courses Pass/Fail in accordance with the College of Engineering Regulations (No.13). The Pass/Fail forms can be printed from the following website:
http://registrar.wisc.edu/forms/student/pass_fail_form.php. Print three copies and turn two copies into 2205 EH by the Pass/Fail deadline (see the registrar's website for the deadline).

Professional Engineering Exams

In the field of Civil and Environmental Engineering, becoming a licensed Professional Engineer is imperative for career advancement and for certifying to the public your commitment to ethical and wise practice with consideration of economic, environmental, and public health and safety issues. Passing the Fundamentals of Engineering (FE) Exam is a pre-requisite for becoming a licensed Professional Engineer. CEE students should plan to take the FE exam during their senior year.

The FE Exam is held twice per year, once every fall and spring. Registration for the test must be completed at least ninety days prior to the exam. To register for the exam online go to <http://www.eps.ca.gov/TAKEATest/Wisc/index.asp>. Also, see this website for information on requirements to become a Professional Engineer in Wisconsin. At least four years of professional, post-college experience is required to apply for the Principles and Practice Examination (PE); passing this examination, along with the required experience and passing the FE exam, qualify you to become a licensed Professional Engineer.

Student Organizations

There are over 600 student organizations at UW-Madison. For a complete listing of student organizations go to <http://www.wisc.edu/studentLife/gettingInvolved.php>. The following is a list of student organizations in which many Civil Engineering students are involved:

- 1) American Society of Civil Engineers
<http://www.engr.wisc.edu/studentorgs/asce/>
- 2) ASCE Concrete Canoe
<http://www.engr.wisc.edu/studentorgs/canoe/>
- 3) Chi Epsilon Civil Engineering Honor Society
<http://soo.studentorg.wisc.edu/sooform/search/orginfo.asp?RegHistoryID=8961>
- 4) Construction Club (UW)
<http://www.engr.wisc.edu/cee/current/undergrad/constclub.html>
- 5) Steel Bridge Team (UW)
<http://www.engr.wisc.edu/studentorgs/bridge/>
- 6) Transportation Society (UWiTS)
<http://www.engr.wisc.edu/studentorgs/uwits/>
- 7) Engineers Without Borders (EWB)

<http://ewb.engr.wisc.edu/index.php?lid=in>

Sample CEE Planning Grid

PLEASE SEE YOUR ADVISOR FOR PROPER COURSE PLANNING!

Year 1		Year 2		Year 3		Year 4	
Fall		Fall		Fall		Fall	
*MATH 221, 217, or 275	5 cr	MATH 234	3 cr	CEE 340	4 cr	Applied Engineering	13 cr
*CHEM 109 or 103-104	5cr	CEE 320	3 cr	CEE 370	3 cr	Liberal Studies Elec.	3 cr
*Comm A	2cr	STAT 224	3 cr	CEE 311	3 cr		
Introduction to Engineering	1-3cr	EMA 202**	3 cr	EPD 397	3 cr		
Liberal Studies Elec.	3 cr	BOT/ZOO 260/151 or BACT 101	3 cr	ECON 101,102, or 111	3-4 cr		
Total Credits	16-18	Total Credits	15	Total Credits	16-17	Total Credits	16
Spring		Spring		Spring		Spring	
*Math 222 or 276	5cr	EMA 303	3 cr	Environ. Studies Elec.	3 cr	Applied Engineering	13 cr
*EMA 201**	3 cr	EMA/ME 307	1 cr	CEE 330	4 cr	CEE 578	4 cr
ME 170	2 cr	EPD 275	2 cr	CEE 395	3 cr		
GEOL 100, 101, or 106	3 cr	CEE 310	3 cr	PHYSICS 202 or 208	5 cr		
Liberal Studies Elec.	3 cr	CEE 291	3 cr				
		MATH 319 or 320	3 cr				
Total Credits	16	Total Credits	15	Total Credits	15	Total Credits	17
Total Credits for Bachelor of Science in Civil Engineering: 127 Credits							

***General College Requirements—Required for ALL first-year engineering students**

The General College Requirements Include:

1. Fulfillment of Communication A General Education Requirement
2. Physics: Either EMA 201 or PHYSICS 201
3. Chemistry: Either CHEM 109 or CHEM 103/104
4. Introduction to Engineering: One course from Inter Engr 160, Inter Engr 101, or a course from the pre-approved list
5. Math: Math 221 (or 217 or 275) and 222 (or 276)

** Students who take Physics 201 as part of the GCR may use it for EMA 202 in year 2. In such a case, they must take EMA 201 instead.

The following classes will only be offered in the Fall Semester: CEE 340 & CEE 370.

The following class will only be offered in the Spring Semester: CEE 395.

Required Curriculum

I. MATH/STATISTICS REQUIREMENT (9 credits)

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 three equivalent math courses to meet the calculus requirement. If these courses total fewer than twelve credits, one additional math course is required. If they total fewer than thirteen credits, additional natural science or applied engineering elective credit may be taken to bring the total to thirteen credits. 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 one 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 (11 credits)

Physics 202 or 208	5 cr
Geology 100 (3 cr), 101 (5 cr), or 106 (3 cr)	3 cr
Botany/Zoology 151 (5 cr) or 260 (3 cr), or Bacteriology 101	3 cr

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 (17 credits)

*EMA 202	Dynamics	3 cr
EMA 303	Mechanics of Materials	3 cr
EMA/ME 307	Mechanics of Materials Lab	1 cr
CEE 310	Fluid Mechanics	3 cr
CEE 340	Structural Analysis	4 cr
CEE 395	Materials for Constructed Facilities	3 cr

**Physics 201 may be used for EMA 202. In such a case, students must take EMA 201 to fulfill this requirement.*

IV. CIVIL ENGINEERING REQUIREMENT (18 credits)

ME 170	Civil Engineering Graphics	2 cr
CEE 291	Engineering Spatial Measurements	3 cr
CEE 311	Hydroscience	3 cr
CEE 320	Environmental Engineering	3 cr
CEE 330	Soil Mechanics	4 cr
CEE 370	Transportation Engineering	3 cr

V. APPLIED ENGINEERING REQUIREMENT (30 credits)

- Technical/Natural Science Courses 13 cr
 - Civil and Environmental Engineering Courses 17 cr
- 1) Every student must complete the senior capstone requirement by taking CEE 578.
 - 2) Except as noted below (item 5), 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.
 - 3) Requirements for the Technical/ Natural Science Courses (13 cr) are given below:
 - a) At least three credits of an engineering science course must be taken outside of the CEE Department and be from a degree-granting department within the College of Engineering (*Course number must be above 240 and EPD & INTER ENGR courses do not count*). Recommended topics/courses include thermodynamics, electrical circuits, materials science, and transport phenomena.
 - b) Any courses in the College of Engineering, including CEE, that do not carry social science or humanities credit may be used (If not taken as part of GCR requirement, students may use one EPD course in Applied Engineering). Students are encouraged to take CEE classes to enrich their understanding in the Civil and Environmental Engineering field.
 - c) Any technical/natural science courses, numbered above 240, that are offered at the UW-Madison campus and are classified as B, P, or N in the Timetable may be used. (Timetable designators: B-Biological Science; P-Physical Science; N-Natural Science)

Note: Students who are considering graduate study are strongly encouraged to take an additional mathematics course as a technical/natural science elective. Recommended courses include Math 321 (Applied Mathematical Analysis), Math 340* (Matrix and Linear Algebra), Stat 311 (Mathematical Statistics), Stat 333 (Applied Regression Analysis), and Stat 424 (Experimental Design for Engineers). **Students can't get credit for both Math 340 and Math 320*
 - 4) Every student is strongly encouraged to take one course that includes economics. The following courses are recommended: CEE 493, CEE 494, CEE 624, and IE 313. CEE 598 does not apply.
 - 5) A student may take one of the following courses to fulfill a portion of the Applied Engineering Requirement: ACCT IS 300, GEN BUS 301, or MHR 300.
 - 6) Up to three credits of CEE 001 (Cooperative Education Program) may be used to satisfy the Applied Engineering Requirement (see enclosed Co-Op Process Description).
In order to get credit for a co-op or internship, students must contact John Archambault (archambault@engr.wisc.edu), the Director of the Cooperative Education and Internship Program before the co-op begins.
 - 7) A student graduating with a Civil Engineering degree **must have sixteen or more design credits** and should use the list entitled "Design Credits in CEE Courses" to select courses. Up to three 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 Co-Op (CEE 001) report must be placed in the student's file if design credits are taken. The Design Credit list is available at: <http://www.engr.wisc.edu/cee/current/undergrad/>. Courses not on the list have zero design credits.
 - 8) Students may choose to take a number of advanced courses in any one area of emphasis or may choose to take a collection of courses in different areas of emphasis. Lists of recommended courses in different areas of emphasis are available in the CEE Department Office (2205 EH).

Co-Op Process Description

The Cooperative Education Program allows for students to undertake full-time supervised paid engineering positions, interspersed within their period of full-time study, as part of the undergraduate education and degree program. Civil Engineering students work either January through August or May through December.

One academic degree credit is given for each semester of co-op work. A maximum of three co-op course credits (240-001) are acceptable as Applied Engineering electives toward the BS degree. The experience the student receives must be submitted in a four to five page work report to the co-op office to determine the assignment of the grade. The Department will consider a portion of the co-op credits for Design credits. The student's CEE advisor (or another CEE faculty person) must evaluate the portion of the work that is Design in order for it to receive credit. A copy of the work report should be in the advisor's student file if Design is awarded.

Students are strongly encouraged to pursue academic credit for their co-op assignment, regardless of whether it is necessary or not for their degree. It will be applicable toward satisfying requirements for the PE licensing.

To participate in the co-op program, students must register the semester before the desired work period (no retro credits will be accepted). Engineering Career Services (M1002 Engineering Centers Building) coordinates the program. Students must go through John Archambault, the Director of the Cooperative Education and Internship Program in order to sign up for a co-op.

The typical recruiting timeline is shown below:

<u>Fall</u>	<u>Spring</u>	
September	January	Career Services – first week of classes, on-going throughout the semester
		Career Fair – Typically over 200 employers participate to identify students for on-campus interviews
October	February	On-campus interviews
November	March/April	Second interviews, offers received
December	May	Pre-work meetings

* For CEE students who did not initially receive offers to co-op, the co-op office efforts in the past few years have been very successful in finding placements by contacting possible employers directly. Advisors may also have suggestions of possible employers or refer students to other faculty in a particular area of interest for such suggestions.

VI. COMMUNICATION SKILLS REQUIREMENT (5 credits)

Communication Skills Courses MUST be selected from the list below. Students must choose at least one Speech-Related course and one Writing-Related course.

Speech-Related Courses

EPD 275 Technical Presentations, 2 cr (*strongly recommended*)
Counts towards Technical Communication Certificate offered by EPD
Com Arts 105 Public Speaking, 2cr
Com Arts 181 Elements of Speech (Honors), 3cr
Com Arts 262 Theory & Practice of Argumentation and Debate, 3cr
Com Arts 266 Theory & Practice of Group Discussion, 3cr

Writing-Related Courses

(Satisfies Communication Skills Part B General Education Requirement)

EPD 397 Technical Writing, 3 cr (*strongly recommended*)
Counts towards Technical Communication Certificate offered by EPD
English 201 Intermediate Composition, 3cr
English 203 Creative Writing, 3cr
English 315, Advanced Expository and Critical Writing, 3cr

LIBERAL STUDIES REQUIREMENT (16 credits)

For purposes of this curriculum, liberal studies courses are those that have a Timetable L&S breadth requirement designation of H, L, S, or Z (*H= Humanities, L= Literature, S= Social Sciences, Z= Either Humanities or Social Science*). EPD 101 is also considered a liberal studies course.

At least sixteen 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 course that count towards the Ethnic Studies Requirement and are indicated by a lower case "e".

4) A minimum of six credits designated as humanities (H, L, or Z Timetable designator)

5) A minimum of two courses (6 credits) from the same department or program

At least one of these courses must be an upper-level course, shown in the timetable to have an I, A, or D level designator (*I= Intermediate, A= Advanced, D= Intermediate or Advanced*). Foreign language retro credits fulfill this requirement.*

* *Foreign language courses are considered to have a breadth designation of H. Retro credits, which are credits awarded by foreign language departments for successful completion of a higher level course, do NOT count toward the total credits (16) and do not count as part of the minimum six credits of H, L, or Z. Retro credits may be used to satisfy the depth requirement (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.*

Design Credits Worksheet

A student graduating with a Civil Engineering degree must have sixteen or more design credits, and should use the lists entitled “Design Credits in CEE Courses” to select courses. Every student must complete the senior capstone requirement by taking CEE 578. Up to three 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, 1973 by the CEE faculty entitled “Design in Civil Engineering Curriculum.” A copy of the student’s Engineering Co-Op (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	Design Credits	Semester Taken	Number of Design Credits
CEE 291	.5		
CEE 311	1		
CEE 330	1		
CEE 340	1.5		
CEE 370	.5		
CEE 395	1		
CEE 578	4		
			Total Design Cr =
CEE 578 will be taken in semester: _____			

University of Wisconsin - Department of Civil and Environmental Engineering
Curriculum Checklist

General College Requirements (GCR) 21credits minimum										
Courses			Grade							
General Education – Part A										
Math 221 (or 217 or 275)										
Math 222 (or 276)										
EMA 201 or Physics 201										
Chem 109 or Chem 103/104										
Introduction to Engineering										
General Civil Engineering and Environmental Requirements (76 cr)										
Math & Statistics (9 cr)			Nat Science (11 cr)			Communication Skills (5 cr)				
Courses	CR	Grade	Courses	CR	Grade	Courses	CR	Grade		
Math 234	3		Phys 202/208	5		Speech EPD 275	2			
Math 319 or Math320	3		Bot/Zoo 151, Bot/Zoo 260 or Bact 101	5/3		Writing/Gen Ed. Part B EPD 397	3			
Statistics 224	3		Geology 100, 101, or 106	3/5						
Engineering Principles & Mechanics (18 cr)			Civil Engineering (17 cr)			Liberal Studies (16 cr)				
Courses	CR	Grade	Courses	CR	Grade	Courses	T	I,D,A	CR	Grade
EMA 202*	3		CEE 311	3		Econ 101/102/111			4	
EMA 303	3		CEE 320	3		Environ. Studies				
EMA/ME 307	1		CEE 330	4		Ethnic Studies				
ME 170	2		CEE 340	4		H, L, or Z (6cr.)				
CEE 291	3		CEE 370	3		1.				
CEE 310	3					2.				
CEE 395	3									
						6 cr. from same dept. met?			Yes / No	
						I, D,A course from same dept. met?			Yes / No	

Recording Grades: A) Transfer Credits: enter CR, B) U.W. Madison Credits: enter letter grade

* Physics 201 may be used for EMA 202. In such a case, students must take EMA 201 to fulfill this requirement.

Requirements continued on the next page.

University of Wisconsin - Department of Civil and Environmental Engineering
Curriculum Checklist

*** The CEM, EE, and FSE Options may have additional requirements not shown here. See your advisor and consult the appropriate curriculum guidelines.**

Applied Engineering Requirements															
General CEE (30 cr)				CEM Option*				EE Option*				FSE Option*			
CEE (17 cr. min)	Design CR	CR	Grade	CEM	Design CR	CR	Grade	EE	Design CR	CR	Grade	FSE	Design CR	CR	Grade
CEE 578 Capstone	4	4		CEE 578 Capstone <i>See advisor for specific course requirements</i>	4	4		CEE 578 Capstone <i>See advisor for specific course requirements</i>	4	4		CEE 578 Capstone <i>See advisor for specific course requirements</i>	4	4	
Tech/Nat Science				Tech/Nat Science				Tech/Nat Science				Tech/Nat Science			
Eng. Not CEE (3 credits min)				Eng. Not CEE (3 credits min)				Eng. Not CEE (3 credits min)				Eng. Not CEE (3 credits min)			

Recommended Lists of Study for Areas of Specialization within CEE

The following lists of courses have been developed to aid in guiding students who may choose to have an emphasis in a particular area of study within CEE. Please note, however, that this is not an exhaustive of CEE technical Electives.

All Areas

- CEE 491 Legal Aspects of Engineering (3 cr)
- CEE 494 Civil & Environmental Engineering Decision Making (3 cr)
- CEE 495 Civil & Environmental Engineering Systems Modeling Techniques (3 cr)
- CEE 576 Advanced Highway Design (3 cr)

Construction Engineering and Management

- CEE 492 Estimates and Costs (3 cr)
- CEE 494 Civil & Environmental Engineering Decision Making (3 cr)
- CEE 497 Mechanical Systems (3 cr)
- CEE 498 Construction Projection Management (3 cr)
- CEE 590 Construction Systems (3 cr)
- CEE 596 Constructability Analysis (3 cr)
- CEE 695 Design and Characterization of Bituminous Mixtures (3 cr)
- CEE 698 Special Topics in CEM (1-4 cr)

Environmental Engineering

Water Supply and Resources:

- CEE 315 Hydrology (3 cr)
- CEE 316 Hydraulic Engineering (3 cr)
- CEE 412 Groundwater Hydraulics (3 cr)
- CEE 414 Hydrologic Design (3 cr)
- CEE 425 Design of Water Distribution and Waste-Water Collection (3 cr)
- CEE 428 Water Treatment Plant Design (3 cr)
- CEE 521 Industrial Pollution Control (3 cr)
- CEE 416 Optimization and Simulation of Water Resources Systems (3 cr)
- CEE 429 Environmental Systems Optimization (3 cr)
- CEE 624 Cost Engineering for Pollution Prevention (3 cr)
- CEE 629 Fate and Modeling (3 cr)

Environmental Chemistry:

- CEE 500 Water Chemistry (3 cr)
- CEE 501 Water Analysis-Intermediate (2 cr)
- CEE 424 Environmental Engineering Laboratory (2 cr)
- CEE 503 Water Analysis-Intermediate Lab (1 cr)
- CEE 502 Environmental Organic Chemistry (3 cr)
- CEE 501 or CEE 424 plus CEE 503

Wastewater Management:

- CEE 315 Hydrology (3 cr)
- CEE 414 Hydrologic Design (3 cr)
- CEE 425 Design of Water Distribution and Waste-Water Collection (3 cr)
- CEE 521 Industrial Pollution Control (3 cr)

Solid Waste Management:

- CEE 427 Solid and Hazardous Waste Engineering (3 cr)

Hazardous Wastes Management:

- CEE 522 Hazardous Waste Management (3 cr)
- CEE 533 Waste Geotechnics (3 cr)
- CEE 535 Remediation Geotechnics (3 cr)

Air Pollution Control Engineering:

- CEE 423 Air Pollution Effects, Measurement and Control (3 cr)
- AOS 535 Atmospheric Dispersion and Air Pollution (3 cr)

Occupational Health Engineering:

- CEE 422 Elements of Public Health Engineering (3 cr)
- CEE 631 Toxicants in the Environment: Sources, Distribution, Fate & Effects (3 cr)

Geoengineering

- CEE 431 Automated Laboratory and field Measurement (3 cr)
- CEE 530 Seepage and Slopes (3 cr)
- CEE 531 Retaining Structures (3 cr)
- CEE 532 Foundations (3 cr)
- CEE 633 Waste Geotechnics (3 cr)
- CEE 534 Field Methods in Geological Engineering (3 cr)
- CEE 635 Remediation Geotechnics (3 cr)
- CEE 627 Hydrogeology (4 cr)
- CEE 629 Contaminant Hydrogeology (3 cr)

Geo-Spatial Information Engineering

- CEE 301 Introduction to Aerial Photographic Systems (1 cr)
- CEE 302 Introduction 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 307 Fundamental Computations for Land Information Systems (1 cr)
- CEE 308 Spatial Reference Frameworks (1 cr)
- CEE 309 Intro to the Public Land Survey System (1 cr)
- CEE 357 Intro to Geographic Information Systems (4 cr)
- CEE 403 Geometric Analysis of Vertical Aerial Photographs (1 cr)
- CEE 556 Digital Image Processing (3 cr)
- CEE 656 Engineering Applications of Land and Geographic Information Systems (3 cr)

Structural Engineering

- CEE 442 Wood Design (3 cr)
- CEE 445 Steel Design (3 cr)
- CEE 447 Concrete Design (3 cr)
- CEE 440 Structural Analysis (3 cr)
- CEE 543 Precast Concrete (3 cr)
- CEE 545 Steel Design II (3 cr)
- CEE 547 Concrete Design II (3 cr)
- CEE 549 Structural Systems (3 cr)
- CEE 641 Highway Bridges (3 cr)

Transportation Engineering

- CEE 571 Urban Transportation Planning (3 cr)
- CEE 573 Geometric Design of Transport Facilities (3 cr)
- CEE 574 Traffic Control (3 cr)

Water Resources Engineering

- CEE 315 Hydrology (3 cr)
- CEE 316 Hydraulic Engineering (3 cr)
- CEE 411 Open Channel How (3 cr)
- CEE 412 Groundwater Hydraulics (3 cr)
- CEE 414 Hydrologic Design (3 cr)
- CEE 514 Coastal Engineering (3 cr)

Civil Engineering Technology

Associate in Applied Science Degree

Applied Engineer Technologies Cluster

Center for Agriscience & Technologies

Program offered at Madison Campus

For information call: (608) 246-6552 or (608) 246-6232
(800) 322-6282 Ext. 6552 or 6232

About the Program

This program trains technicians to assist civil engineers in planning, scheduling, designing, estimating, surveying and inspecting the construction of highways, bridges, buildings and other structures. Specific courses provide a student with the option for a career in land surveying.

Unique Requirements for Admission

High school course recommendations: We strongly recommend that students take the math sequence of Algebra 1 and Algebra 2 to best prepare them for this program. In addition, a high school physical science course is highly recommended. Students must earn a 2.0 (C) or better in the high school courses. Contact the Civil Engineering academic advisor at (608) 246-6232 for pre-registration advising.

The Civil Engineering Program participates in MAAP (Mandatory Assessment, Advising and Placement). This requires new students to complete the COMPASS or ASSET test. Advisement and course placement in English and math is done based on test results. Testing will be required prior to admission.

Curriculum

FIRST YEAR

First Semester		Credits	Hrs/week Lec-Lab
10-103-134	Windows	1	2.25-.75
10-103-137	Word-Beginning	1	2.25-.75
10-607-120	Methods in Civil Engineering	2	2-0
10-607-155	Survey 1	3	2-3
10-801-195	Written Communication	3	3-0
10-804-114	College Technical Math 1B	2	2-0
10-809-197	Contemporary American Society	3	3-0
10-809-199	Psychology of Human Relations	3	3-0
Semester Total		18	

Second Semester

10-103-133	Excel-Beginning	1	2.75-.75
10-607-147	Civil Drawing 1	2	1-3
10-607-149	Aggregates and Concrete	2	1-3
10-607-156	Survey 2	3	2-3
10-607-193	Career Development	1	1-0
10-804-116	College Technical Math 2	4	4-0
10-806-154	General Physics	4	3-1
Semester Total		17	

SECOND YEAR

First Semester

10-607-148	Civil Drawing 2	2	1-3
10-607-158	Survey 3	3	2-3
10-607-160	Soils	2	1-3
10-607-176	Site Hydraulics	2	1-2
10-607-177	Legal Elements of Engineering	2	2-0
10-801-197	Technical Reporting	3	3-0
<u>Elective</u>		<u>3</u>	<u>E</u>
Semester Total		17	

Second Semester

10-607-133	Estimating	3	2-2
10-607-161	Project	3	1-6
10-607-171	Construction Materials	2	2-2
10-607-179	Introduction to GIS	2	1-1
10-809-195	Economics	3	3-0
<u>Elective</u>		<u>3</u>	<u>E</u>
Semester Total		16	

Note: Students are assessed for correct placement in English or mathematics courses based on their scores on the COMPASS test or on completion of the appropriate prerequisite/s. Additionally, there may be courses in other subject areas that may use COMPASS scores as prerequisites when reading, writing, math, or critical thinking competencies are required.

Program Courses

10-607-120 Methods in Civil Engineering 2 credits

An introductory engineering course that familiarizes students with the civil engineering and construction processes from project concept to completion. Provides new students opportunity to develop and improve their problem-solving skills and prepare for subsequent technical courses.

10-607-133 Estimating 3 credits

Stresses estimating for general civil engineering work. Covers the preparation of detailed estimates as prepared by contractors for bidding purposes, the general estimate as prepared by engineers, and approximate estimates. Areas covered: highways, water and sewer lines, bridges, culverts, streets and general construction grading. Prerequisite: 10-607-177, fourth-semester standing or consent of instructor.

10-607-147 Civil Drawing 1 2 credits

Emphasis on development of graphical communication. Begins with basic manual drafting skills including line work, lettering, drafting tools use and free hand sketching of construction details. Transition in the last half of the semester to a CAD-based environment stressing geometric construction principles and simple engineering drawings. Corequisites: 10-607-155 and 10-103-134.

10-607-148 Civil Drawing 2 2 credits

Applications-oriented class with CAD emphasis. More complex drawing projects including mapping, roadway design elements and structural detail applications. Drawing organization and standards, data conversion and sharing, third-party add-ins. Prerequisite: 10-607-147 and 10-607-156.

10-607-149 Aggregates and Concrete 2 credits

Introduces the fundamental principles of aggregates, Portland cement concrete and bituminous concrete. Emphasizes standards-based sampling and testing in laboratory and field environments. Tests are performed according to standards set by the American Society for Testing and Materials (ASTM) and American Association of State Highway and Transportation Officials (AASHTO). Students communicate results in written reports. Prerequisites: 10-804-114 and 10-103-137.

10-607-155 Survey 1 3 credits

Basic measurement concepts, procedures, errors and computations underlying the technical aspects of surveying. Students use modern instrumentation to perform elevation, distance, and angular measurements. Coordinate geometry is introduced as a computational tool. Computations are done both manually and on computer using commercial software. Corequisites: 10-804-114, 10-607-120, and 10-103-134.

10-607-156 Survey 2 3 credits

Principles, computations and field methods, from design to stakeout, involved in three-dimensional curvilinear survey applications. AASHTO and WisDOT vertical and horizontal alignment standards; geometric and volumetric calculations. Field work reflecting different construction surveys are performed utilizing modern instrumentation. Prerequisite: 10-607-155. Corequisites: 10-607-147 and 10-804-116.

10-607-158 Survey 3 3 credits

Advanced concepts and procedures building on knowledge and skills attained in previous surveying classes. Concepts include geodetic applications, spatial reference systems, equipment adjustment, digital data collection and photogrammetry. Fieldwork includes total station calibration, control leveling, control network establishment and digital topographic data collection. Prerequisites: 10-607-156 and 10-607-147.

10-607-160 Soils 2 credits

Introduces the basic principles of soil mechanics and their application in engineering practice. Topics include soil composition and texture, subsurface investigation, classification, moisture-density relationships, permeability and seepage, consolidation, settlement, shear strength, lateral earth pressures, fundamentals of retaining structures, shallow and deep foundations, slope stability and erosion loss calculations. Prerequisites: 10-806-154, 10-607-149. Corequisite: 10-801-197.

10-607-161 Project 3 credits

Project-driven course through which civil engineering technicians gain firsthand experience with design by developing plans, specifications and reports for a "real-world" project while working in a team environment. Students present written and oral reports to reinforce technical communication skills. Prerequisites: 10-607-148, 10-607-158 and 10-607-176. Corequisite: 10-607-133.

10-607-171 Construction Materials 2 credits

Introduction to the design, specification and detailing of steel and reinforced concrete in typical civil engineering projects. Emphasis on infrastructural applications. Prerequisite: 10-607-160.

10-607-176 Site Hydraulics 2 credits

Basic concepts of hydraulics and hydrology, water resources, distribution systems and sewerage collection systems as applied to site development. Prerequisites: 10-607-149.

10-607-177 Legal Elements of Engineering 2 credits

Emphasizes contract relationships. The first half of the semester is spent studying the elements of a valid contract along with a study of the court system. The remainder of the semester concentrates on specifications, contracting procedure and the relationship between the three main parties involved in a construction contract: owner, engineer and contractor. Other topics include professional liability, professional ethics, product liability, discharge and remedies for non-completion. Prerequisite: third-semester standing or consent of instructor.

10-607-179 Introduction to GIS 2 credits

Basic terminology and components of geographic information systems. Capturing and organizing spatial data; integrating graphic and tabular information. Using spatial relationships to answer geographic queries. Civil engineering applications of GIS technology. Prerequisite: 10-607-147 or consent of instructor

10-607-193 Career Development 1 credit

Prepares students for work in a professional engineering environment by providing them with a knowledge and understanding of themselves and others. This course also guides students through the etiquette required for success in the job market and assists them in assembling the materials and information necessary for effective job applications and interviews. Prerequisites: 10-801-151 and 10-607-120.

Recommended Electives

10-607-180	Internship	1 credit
10-607-190	Special Problems	1 credit

Note: The following two elective courses allow students to meet educational requirements for land surveyor registration as defined in Chapter A-E 6.04 of the Wisconsin Administrative Code. Students interested in a career in Land Surveying should consider taking these courses:

10-607-168	Land Surveying 1	3 credits
10-607-175	Land Surveying 2	3 credits

Career Potential:

- Construction Inspector
- Survey Technician
- Civil CAD Technician
- Materials Testing Technician

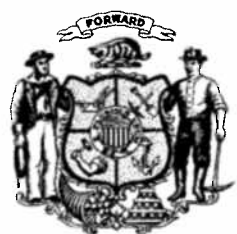
More detailed and updated information on this program may be available at: www.matcmadison.edu. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.

Madison Area Technical College provides equal opportunity in education and employment.

Rev. 11/07



WISCONSIN STATE LEGISLATURE





DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING
UNIVERSITY OF WISCONSIN - MADISON

1415 Engineering Drive
Madison, Wisconsin 53706

608-262-7244 (Phone)
608-262-5199 (FAX)
russell@cngn.wisc.edu

Packet

4 March, 2008

Senator Spencer Coggs
Chair, Committee on Labor, Elections and Urban Affairs
Room 123 South
Capital Capitol
PO Box 7882
Madison, WI 53707-7882

Dear Senator Coggs,

Thank you for allowing me the opportunity to testify before the Committee on Labor, Elections and Urban Affairs on Wednesday, 27 February regarding Assembly Bill 69. I am writing to provide a brief summary of the points I made during my testimony.

1. The faculty of the UW-Madison Department of Civil and Environmental Engineering voted unanimously to support Assembly Bill 69. The faculty voted unanimously against Senate Amendment 1 which allows "a diploma of graduation or degree from a technical college in an engineering-related course of study of not less than 2 years."
2. A technology degree is not equivalent in terms of academic breadth, depth, and preparation to an ABET-accredited engineering degree. A simple comparison of the actual curriculum of both degree programs makes this quite clear. Please refer to the attachments that illustrate the breadth and depth of the engineering curriculum at some of the engineering programs within the University of Wisconsin System.
3. Experience is important in preparing a professional engineer but is not a replacement for fundamental knowledge in math, science, engineering science, breadth in engineering topics, breadth in humanities and social sciences, and breadth in professional practice topics. The world is simply too complex with increasing rates of technological change to expect 2 years of additional practical experience to replace fundamental knowledge that is part of formal engineering education.
4. The engineering profession has recommended education beyond the bachelor's degree. The National Academy of Engineering recently released two reports recommending that the bachelor's degree be considered a pre-engineering degree and that the master's be the entry-level degree. Furthermore, the National Council of Examiners for Engineering and Surveying (NCEES), made up of 70 licensure boards from across the country, created a Model Law that seeks to provide greater uniformity of qualifications for licensure and to raise these qualifications to a higher level of accomplishment. The Model Law is simply a consensus of what the NCEES member boards think the statutes should look like. The current Model Law requires an ABET-accredited degree in engineering or equivalent. Effective 1 January 2015, the Model Law will be changed to include the bachelor's degree plus 30 additional credits in upper-level technical and professional practice courses. The engineering profession is advocating additional education to better serve society and protect public health, safety and welfare. The education and licensure bar is being raised not lowered.

At the UW College of Engineering, we are preparing the next generation of engineers who will face a fast-paced, ever changing world. Our graduates will deal with significant challenges in areas such as energy, drinking water, clean air, safe waste disposal, transportation, and sustainability. Our students take significant coursework in the engineering sciences, and we also know they must be well-rounded in other areas such as communications, business management and public policy. I call your attention to the attached document that details the credit requirements for

receiving a degree in Civil and Environmental Engineering from UW-Madison. The coursework is challenging and demanding, with a comprehensive blend of math, statistics, engineering science, applied engineering, communications, and liberal studies. One can contrast such a rigorous regimen with sample Associate Degree programs available at the State's technical colleges. For example:

- In a two-year program at Northcentral Technical College, students can earn an Associate of Applied Science degree as an Applied Engineering Technician by completing 62 credits for graduation.

- A two-year program at the Milwaukee Area Technical College requires 70 credits for a student to receive an Associate in Applied Science degree in civil engineering technology. A similar program at Madison Area Technical College requires 68 credits for graduation.

While these technical college programs serve a distinct need, they are focusing on applied tools and strategies and do not provide the breadth and depth of knowledge and skills that an engineer must possess to successfully deal with the complex challenges facing our modern world.

In closing, the technology programs in Wisconsin make valuable contributions to our quality of life. The key issue is this: What are the key educational requirements for success in a professional whose very job has significant impacts on our collective quality of life? When one considers other disciplines, we note that a para-legal is not a lawyer, a physician's assistant is not a doctor, a licensed practical nurse is not a registered nurse. One achieves advanced levels of professional practice and accompanying licensure through a combination of higher education and real-world experience. When it comes to engineering, lowering the standard runs the risk of compromising public health, safety and welfare.

Sincerely Yours,



Jeffrey S. Russell, Ph.D., P.E., F. ASCE
Professor and Chair

Enclosures

- 1) Civil Engineering Curriculum Guide, UW College of Engineering
- 2) Curriculum outline, Civil Engineering Technology, Applied Science Degree, Madison Area Technical College

CC:

Senator Robert Wirth
Senator John Lehman
Senator Glenn Grothman
Senator Alan Lasee
Senator Jeffrey Plale
Representative Mark Gottlieb
Representative Samantha Kerkman
Representative Alvin Ott
Representative John Townsend

Civil Engineering Curriculum Guide

Mission of Civil and Environmental Engineering (CEE) Undergraduate Program

Create, integrate, and transfer civil and environmental engineering knowledge and practice in the development of professionals, leaders, and citizens that help define and serve societal and environmental needs by applying this knowledge and practice in an effective and sustainable manner.

Educational Objectives

BSCE graduates are prepared to contribute to their communities through the following career and professional accomplishments:

- 1) plan, design, construct and manage both natural and built processes and systems to meet determined needs using technical knowledge, computer tools, and design principles with communication, leadership, and team skills;
- 2) utilize measurement and analysis tools along with experimental data in investigating natural and built systems;
- 3) understand and incorporate economic, environmental, political, social, safety and global considerations in design, investigation, and construction of natural and built systems;
- 4) enhance analysis and design tools and experience through life long learning; and
- 5) serve others through professional responsibility, leadership and participation in professional and public activities, and good citizenship.

CEE Program Outcomes

1. Evaluate constructed facilities and natural systems, structure, processes, or conditions to meet determined societal needs. Design sustainable facilities and systems to meet these needs, while protecting the environment, conserving resources, and maintaining quality of life.
2. Select and apply appropriate analyses methods to solve well-defined problems, related to civil engineering, using knowledge of mathematics, statistics, computer tools, natural and engineering sciences, material properties, and civil engineering.
3. Understand and use instrumentation and methods to obtain data, calibration and validate devices and processes, including assessment of accuracy and errors.
4. Participate in various roles of a team whose function is to define, analyze, and synthesize a solution to an open ended design problem. Understand that problems' relevant multi-disciplinary aspects and contemporary issues.
5. Understand the role of a leader and leadership principles and attitudes.
6. Prepare and present well organized written engineering solutions, designs, and plans that are appropriate for a particular audience.
7. Recognize and respond to ethical and legal, economic, health and environment, political, safety, and social factors in decisions that affect project completion, analysis, design, construction, operation, and conduct of duties.
8. Understand common failure mechanisms and analyze the failure risk or actual failure of a process or system.
9. Understand principle elements of project management, construction, and asset management and their relation to project development, operation, and maintenance. Understand fundamentals of business, public policy, and administration and their relation to project development, operation and maintenance.
10. Determine the life-cycle cost of a process, component, or system and perform basic analyses of alternative, feasible solutions for a project.
11. Recognize the need and plan to engage in life-long learning.

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!
- Bring a copy of your DARS report to every advising appointment

General College Requirements	21 Credits*
CEE Requirements	106 Credits
Math and Statistics Requirement	9
Natural Sciences Requirement	11
Engineering Science Requirement	17
Civil Engineering Requirement	18
Applied Engineering Requirement	30
Communication Skills Requirement	5
Liberal Studies Requirement	16
Total Credits	127

General College Requirements
 General Education Communication Skills – Part A
 Math 221 (or 217 or 275)
 Math 222 (or 276)
 EMA 201 or Physics 201
 Chem 109 or Chem 103/104
 Introduction to Engineering

*The General College Requirements (GCR) may be satisfied by a number of different courses depending on the student's background and interest. As a result, the number of credits taken as part of the GCR may vary from a minimum of 21 to maximum of 29 depending on the selection of courses.

The CEE Department offers three undergraduate options programs: Construction Engineering Management (CEM), Environmental Engineering (EE) and Fluid Systems Engineering (FSE). Once students have been accepted to the CEE Department they may choose to apply to one of the option

programs. Option programs are not required. For more information or to apply to an option, please see Abby Dawes in 2205 EH.

Important Contact Information

Chair- Jeffrey Russell <i>russell@engr.wisc.edu (608) 262-7244</i>	Office: 2205 Engineering Hall (EH)
Senior Administrator- Marsha Landretti <i>landretti@engr.wisc.edu (608) 262-7812</i>	Office: 2208 EH
Student Services Coordinator- Abby Dawes <i>aedawes@wisc.edu (608) 890-0864</i>	Office: 2205 EH

Pass/Fail Regulations

Up to two Pass/Fail courses may count towards the CEE degree. These courses **MUST** be liberal studies electives and do not include the required ECON 101 (or equivalent) or the required Environmental Issues Course. CEE students must take courses Pass/Fail in accordance with the College of Engineering Regulations (No.13). The Pass/Fail forms can be printed from the following website:
http://registrar.wisc.edu/forms/student/pass_fail_form.php. Print three copies and turn two copies into 2205 EH by the Pass/Fail deadline (see the registrar's website for the deadline).

Professional Engineering Exams

In the field of Civil and Environmental Engineering, becoming a licensed Professional Engineer is imperative for career advancement and for certifying to the public your commitment to ethical and wise practice with consideration of economic, environmental, and public health and safety issues. Passing the Fundamentals of Engineering (FE) Exam is a pre-requisite for becoming a licensed Professional Engineer. CEE students should plan to take the FE exam during their senior year.

The FE Exam is held twice per year, once every fall and spring. Registration for the test must be completed at least ninety days prior to the exam. To register for the exam online go to <http://www.cps.ca.gov/TakeATest/Wisc/index.asp>. Also, see this website for information on requirements to become a Professional Engineer in Wisconsin. At least four years of professional, post-college experience is required to apply for the Principles and Practice Examination (PE); passing this examination, along with the required experience and passing the FE exam, qualify you to become a licensed Professional Engineer.

Student Organizations

There are over 600 student organizations at UW-Madison. For a complete listing of student organizations go to <http://www.wisc.edu/studentLife/gettingInvolved.php>. The following is a list of student organizations in which many Civil Engineering students are involved:

- 1) American Society of Civil Engineers
<http://www.engr.wisc.edu/studentorgs/asce/>
- 2) ASCE Concrete Canoe
<http://www.engr.wisc.edu/studentorgs/canoe/>
- 3) Chi Epsilon Civil Engineering Honor Society
<http://soo.studentorg.wisc.edu/sooform/search/orginfo.asp?RegHistoryID=8961>
- 4) Construction Club (UW)
<http://www.engr.wisc.edu/cee/current/undergrad/constclub.html>
- 5) Steel Bridge Team (UW)
<http://www.engr.wisc.edu/studentorgs/bridge/>
- 6) Transportation Society (UWiTS)
<http://www.engr.wisc.edu/studentorgs/uwits/>
- 7) Engineers Without Borders (EWB)

<http://ewb.engr.wisc.edu/index.php?lid=in>

Sample CEE Planning Grid

PLEASE SEE YOUR ADVISOR FOR PROPER COURSE PLANNING!

Year 1		Year 2		Year 3		Year 4	
Fall		Fall		Fall		Fall	
*MATH 221, 217, or 275	5 cr	MATH 234	3 cr	CEE 340	4 cr	Applied Engineering	13 cr
*CHEM 109 or 103-104	5cr	CEE 320	3 cr	CEE 370	3 cr	Liberal Studies Elec	3 cr
*Comm A	2cr	STAT 224	3 cr	CEE 311	3 cr		
Introduction to Engineering	1-3cr	EMA 202**	3 cr	EPD 397	3 cr		
Liberal Studies Elec.	3 cr	BOT/ZOO 260/151 or BACT 101	3 cr	ECON 101,102, or 111	3-4 cr		
Total Credits	16-18	Total Credits	15	Total Credits	16-17	Total Credits	16
Spring		Spring		Spring		Spring	
*Math 222 or 276	5cr	EMA 303	3 cr	Environ. Studies Elec.	3 cr	Applied Engineering	13 cr
*EMA 201**	3 cr	EMA/ME 307	1 cr	CEE 330	4 cr	CEE 578	4 cr
ME 170	2 cr	EPD 275	2 cr	CEE 395	3 cr		
GEOL 100, 101, or 106	3 cr	CEE 310	3 cr	PHYSICS 202 or 208	5 cr		
Liberal Studies Elec.	3 cr	CEE 291	3 cr				
		MATH 319 or 320	3 cr				
Total Credits	16	Total Credits	15	Total Credits	15	Total Credits	17
Total Credits for Bachelor of Science in Civil Engineering: 127 Credits							

***General College Requirements—Required for ALL first-year engineering students**

The General College Requirements Include:

1. Fulfillment of Communication A General Education Requirement
2. Physics: Either EMA 201 or PHYSICS 201
3. Chemistry: Either CHEM 109 or CHEM 103/104
4. Introduction to Engineering: One course from Inter Engr 160, Inter Engr 101, or a course from the pre-approved list
5. Math: Math 221 (or 217 or 275) and 222 (or 276)

** Students who take Physics 201 as part of the GCR may use it for EMA 202 in year 2. In such a case, they must take EMA 201 instead.

The following classes will only be offered in the Fall Semester: CEE 340 & CEE 370.

The following class will only be offered in the Spring Semester: CEE 395.

Required Curriculum

I. MATH/STATISTICS REQUIREMENT (9 credits)

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 three equivalent math courses to meet the calculus requirement. If these courses total fewer than twelve credits, one additional math course is required. If they total fewer than thirteen credits, additional natural science or applied engineering elective credit may be taken to bring the total to thirteen credits. 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 one 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 (11 credits)

Physics 202 or 208	5 cr
Geology 100 (3 cr), 101 (5 cr), or 106 (3 cr)	3 cr
Botany/Zoology 151 (5 cr) or 260 (3 cr), or Bacteriology 101	3 cr

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 (17 credits)

*EMA 202	Dynamics	3 cr
EMA 303	Mechanics of Materials	3 cr
EMA/ME 307	Mechanics of Materials Lab	1 cr
CEE 310	Fluid Mechanics	3 cr
CEE 340	Structural Analysis	4 cr
CEE 395	Materials for Constructed Facilities	3 cr

**Physics 201 may be used for EMA 202. In such a case, students must take EMA 201 to fulfill this requirement.*

IV. CIVIL ENGINEERING REQUIREMENT (18 credits)

ME 170	Civil Engineering Graphics	2 cr
CEE 291	Engineering Spatial Measurements	3 cr
CEE 311	Hydroscience	3 cr
CEE 320	Environmental Engineering	3 cr
CEE 330	Soil Mechanics	4 cr
CEE 370	Transportation Engineering	3 cr

V. APPLIED ENGINEERING REQUIREMENT (30 credits)

- Technical/Natural Science Courses 13 cr
 - Civil and Environmental Engineering Courses 17 cr
- 1) Every student must complete the senior capstone requirement by taking CEE 578.
 - 2) Except as noted below (item 5), 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.
 - 3) Requirements for the Technical/ Natural Science Courses (13 cr) are given below:
 - a) At least three credits of an engineering science course must be taken outside of the CEE Department and be from a degree-granting department within the College of Engineering (*Course number must be above 240 and EPD & INTER ENGR courses do not count*). Recommended topics/courses include thermodynamics, electrical circuits, materials science, and transport phenomena.
 - b) Any courses in the College of Engineering, including CEE, that do not carry social science or humanities credit may be used (If not taken as part of GCR requirement, students may use one EPD course in Applied Engineering). Students are encouraged to take CEE classes to enrich their understanding in the Civil and Environmental Engineering field.
 - c) Any technical/natural science courses, numbered above 240, that are offered at the UW-Madison campus and are classified as B, P, or N in the Timetable may be used. (Timetable designators: B-Biological Science; P-Physical Science; N-Natural Science)

Note: Students who are considering graduate study are strongly encouraged to take an additional mathematics course as a technical/natural science elective. Recommended courses include Math 321 (Applied Mathematical Analysis), Math 340* (Matrix and Linear Algebra), Stat 311 (Mathematical Statistics), Stat 333 (Applied Regression Analysis), and Stat 424 (Experimental Design for Engineers). **Students can't get credit for both Math 340 and Math 320*
 - 4) Every student is strongly encouraged to take one course that includes economics. The following courses are recommended: CEE 493, CEE 494, CEE 624, and IE 313. CEE 598 does not apply.
 - 5) A student may take one of the following courses to fulfill a portion of the Applied Engineering Requirement: ACCT IS 300, GEN BUS 301, or MHR 300.
 - 6) Up to three credits of CEE 001 (Cooperative Education Program) may be used to satisfy the Applied Engineering Requirement (see enclosed Co-Op Process Description).
In order to get credit for a co-op or internship, students must contact John Archambault (archambault@engr.wisc.edu), the Director of the Cooperative Education and Internship Program before the co-op begins.
 - 7) A student graduating with a Civil Engineering degree **must have sixteen or more design credits** and should use the list entitled "Design Credits in CEE Courses" to select courses. Up to three 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 Co-Op (CEE 001) report must be placed in the student's file if design credits are taken. The Design Credit list is available at: <http://www.engr.wisc.edu/cee/current/undergrad/>. Courses not on the list have zero design credits.
 - 8) Students may choose to take a number of advanced courses in any one area of emphasis or may choose to take a collection of courses in different areas of emphasis. Lists of recommended courses in different areas of emphasis are available in the CEE Department Office (2205 EH).

Co-Op Process Description

The Cooperative Education Program allows for students to undertake full-time supervised paid engineering positions, interspersed within their period of full-time study, as part of the undergraduate education and degree program. Civil Engineering students work either January through August or May through December.

One academic degree credit is given for each semester of co-op work. A maximum of three co-op course credits (240-001) are acceptable as Applied Engineering electives toward the BS degree. The experience the student receives must be submitted in a four to five page work report to the co-op office to determine the assignment of the grade. The Department will consider a portion of the co-op credits for Design credits. The student's CEE advisor (or another CEE faculty person) must evaluate the portion of the work that is Design in order for it to receive credit. A copy of the work report should be in the advisor's student file if Design is awarded.

Students are strongly encouraged to pursue academic credit for their co-op assignment, regardless of whether it is necessary or not for their degree. It will be applicable toward satisfying requirements for the PE licensing.

To participate in the co-op program, students must register the semester before the desired work period (no retro credits will be accepted). Engineering Career Services (M1002 Engineering Centers Building) coordinates the program. Students must go through John Archambault, the Director of the Cooperative Education and Internship Program in order to sign up for a co-op.

The typical recruiting timeline is shown below:

<u>Fall</u>	<u>Spring</u>	
September	January	Career Services – first week of classes, on-going throughout the semester
		Career Fair – Typically over 200 employers participate to identify students for on-campus interviews
October	February	On-campus interviews
November	March/April	Second interviews, offers received
December	May	Pre-work meetings

* For CEE students who did not initially receive offers to co-op, the co-op office efforts in the past few years have been very successful in finding placements by contacting possible employers directly. Advisors may also have suggestions of possible employers or refer students to other faculty in a particular area of interest for such suggestions.

VI. COMMUNICATION SKILLS REQUIREMENT (5 credits)

Communication Skills Courses MUST be selected from the list below. Students must choose at least one Speech-Related course and one Writing-Related course.

Speech-Related Courses

EPD 275 Technical Presentations, 2 cr (*strongly recommended*)

Counts towards Technical Communication Certificate offered by EPD

Com Arts 105 Public Speaking, 2cr

Com Arts 181 Elements of Speech (Honors), 3cr

Com Arts 262 Theory & Practice of Argumentation and Debate, 3cr

Com Arts 266 Theory & Practice of Group Discussion, 3cr

Writing-Related Courses

(Satisfies Communication Skills Part B General Education Requirement)

EPD 397 Technical Writing, 3 cr (*strongly recommended*)

Counts towards Technical Communication Certificate offered by EPD

English 201 Intermediate Composition, 3cr

English 203 Creative Writing, 3cr

English 315, Advanced Expository and Critical Writing, 3cr

LIBERAL STUDIES REQUIREMENT (16 credits)

For purposes of this curriculum, liberal studies courses are those that have a Timetable L&S breadth requirement designation of H, L, S, or Z (*H= Humanities, L= Literature, S= Social Sciences, Z= Either Humanities or Social Science*). EPD 101 is also considered a liberal studies course.

At least sixteen 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 course that count towards the Ethnic Studies Requirement and are indicated by a lower case "e".

4) **A minimum of six credits designated as humanities** (H, L, or Z Timetable designator)

5) **A minimum of two courses (6 credits) from the same department or program**

At least one of these courses must be an upper-level course, shown in the timetable to have an I, A, or D level designator (*I= Intermediate, A= Advanced, D= Intermediate or Advanced*). Foreign language retro credits fulfill this requirement.*

* Foreign language courses are considered to have a breadth designation of H. Retro credits, which are credits awarded by foreign language departments for successful completion of a higher level course, do NOT count toward the total credits (16) and do not count as part of the minimum six credits of H, L, or Z. Retro credits may be used to satisfy the depth requirement (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.

Design Credits Worksheet

A student graduating with a Civil Engineering degree must have sixteen or more design credits, and should use the lists entitled "Design Credits in CEE Courses" to select courses. Every student must complete the senior capstone requirement by taking CEE 578. Up to three 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, 1973 by the CEE faculty entitled "Design in Civil Engineering Curriculum." A copy of the student's Engineering Co-Op (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	Design Credits	Semester Taken	Number of Design Credits
CEE 291	.5		
CEE 311	1		
CEE 330	1		
CEE 340	1.5		
CEE 370	.5		
CEE 395	1		
CEE 578	4		
			Total Design Cr =
CEE 578 will be taken in semester: _____			

University of Wisconsin - Department of Civil and Environmental Engineering
Curriculum Checklist

General College Requirements (GCR) 21 credits minimum										
Courses						Grade				
General Education – Part A										
Math 221 (or 217 or 275)										
Math 222 (or 276)										
EMA 201 or Physics 201										
Chem 109 or Chem 103/104										
Introduction to Engineering										
General Civil Engineering and Environmental Requirements (76 cr)										
Math & Statistics (9 cr)			Nat Science (11 cr)			Communication Skills (5 cr)				
Courses	CR	Grade	Courses	CR	Grade	Courses	CR	Grade	Grade	
Math 234	3		Phys 202/208	5		Speech EPD 275	2			
Math 319 or Math320	3		Bot/Zoo 151, Bot/Zoo 260 or Bact 101	5/3		Writing/Gen Ed. Part B EPD 397	3			
Statistics 224	3		Geology 100, 101, or 106	3/5						
Engineering Principles & Mechanics (18 cr)			Civil Engineering (17 cr)			Liberal Studies (16 cr)				
Courses	CR	Grade	Courses	CR	Grade	Courses	T	I,D,A	CR	Grade
EMA 202*	3		CEE 311	3		Econ 101/102/111			4	
EMA 303	3		CEE 320	3		Environ. Studies				
EMA/ME 307	1		CEE 330	4		Ethnic Studies				
ME 170	2		CEE 340	4		H, L, or Z (6cr.)				
CEE 291	3		CEE 370	3		1.				
CEE 310	3					2.				
CEE 395	3									
						6 cr. from same dept. met?			Yes / No	
						1, D,A course from same dept. met?			Yes / No	

Recording Grades: A) Transfer Credits: enter CR, B) U.W. Madison Credits: enter letter grade

* Physics 201 may be used for EMA 202. In such a case, students must take EMA 201 to fulfill this requirement.

Requirements continued on the next page.

University of Wisconsin - Department of Civil and Environmental Engineering
Curriculum Checklist

* The CEM, EE, and FSE Options may have additional requirements not shown here. See your advisor and consult the appropriate curriculum guidelines.

Applied Engineering Requirements															
General CEE (30 cr)			CEM Option*			EE Option*			FSE Option*						
CEE (17 cr. min)	Design CR	CR	Grade	CEM	Design CR	CR	Grade	EE	Design CR	CR	Grade	FSE	Design CR	CR	Grade
CEE 578 Capstone	4	4		CEE 578 Capstone See advisor for specific course requirements	4	4		CEE 578 Capstone See advisor for specific course requirements	4	4		CEE 578 Capstone See advisor for specific course requirements	4	4	
Tech/Nat Science				Tech/Nat Science				Tech/Nat Science				Tech/Nat Science			
Eng. Not CEE (3 credits min)				Eng. Not CEE (3 credits min)				Eng. Not CEE (3 credits min)				Eng. Not CEE (3 credits min)			

Recommended Lists of Study for Areas of Specialization within CEE

The following lists of courses have been developed to aid in guiding students who may choose to have an emphasis in a particular area of study within CEE. Please note, however, that this is not an exhaustive of CEE technical Electives.

All Areas

- CEE 491 Legal Aspects of Engineering (3 cr)
- CEE 494 Civil & Environmental Engineering Decision Making (3 cr)
- CEE 495 Civil & Environmental Engineering Systems Modeling Techniques (3 cr)
- CEE 576 Advanced Highway Design (3 cr)

Construction Engineering and Management

- CEE 492 Estimates and Costs (3 cr)
- CEE 494 Civil & Environmental Engineering Decision Making (3 cr)
- CEE 497 Mechanical Systems (3 cr)
- CEE 498 Construction Projection Management (3 cr)
- CEE 590 Construction Systems (3 cr)
- CEE 596 Constructability Analysis (3 cr)
- CEE 695 Design and Characterization of Bituminous Mixtures (3 cr)
- CEE 698 Special Topics in CEM (1-4 cr)

Environmental Engineering

Water Supply and Resources:

- CEE 315 Hydrology (3 cr)
- CEE 316 Hydraulic Engineering (3 cr)
- CEE 412 Groundwater Hydraulics (3 cr)
- CEE 414 Hydrologic Design (3 cr)
- CEE 425 Design of Water Distribution and Waste-Water Collection (3 cr)
- CEE 428 Water Treatment Plant Design (3 cr)
- CEE 521 Industrial Pollution Control (3 cr)
- CEE 426 Optimization and Simulation of Water Resources Systems (3 cr)
- CEE 429 Environmental Systems Optimization (3 cr)
- CEE 624 Cost Engineering for Pollution Prevention (3 cr)
- CEE 629 Fate and Modeling (3 cr)

Environmental Chemistry:

- CEE 500 Water Chemistry (3 cr)
- CEE 501 Water Analysis-Intermediate (2 cr)
- CEE 424 Environmental Engineering Laboratory (2 cr)
- CEE 503 Water Analysis-Intermediate Lab (1 cr)
- CEE 502 Environmental Organic Chemistry (3 cr)
- CEE 501 or CEE 424 plus CEE 503

Wastewater Management:

- CEE 315 Hydrology (3 cr)
- CEE 414 Hydrologic Design (3 cr)
- CEE 425 Design of Water Distribution and Waste-Water Collection (3 cr)
- CEE 521 Industrial Pollution Control (3 cr)

Solid Waste Management:

- CEE 427 Solid and Hazardous Waste Engineering (3 cr)

Hazardous Wastes Management:

- CEE 522 Hazardous Waste Management (3 cr)
- CEE 533 Waste Geotechnics (3 cr)
- CEE 535 Remediation Geotechnics (3 cr)

Air Pollution Control Engineering:

- CEE 423 Air Pollution Effects, Measurement and Control (3 cr)
- AOS 535 Atmospheric Dispersion and Air Pollution (3 cr)

Occupational Health Engineering:

- CEE 422 Elements of Public Health Engineering (3 cr)
- CEE 631 Toxicants in the Environment: Sources, Distribution, Fate & Effects (3 cr)

Geoengineering

- CEE 431 Automated Laboratory and field Measurement (3 cr)
- CEE 530 Seepage and Slopes (3 cr)
- CEE 531 Retaining Structures (3 cr)
- CEE 532 Foundations (3 cr)
- CEE 633 Waste Geotechnics (3 cr)
- CEE 534 Field Methods in Geological Engineering (3 cr)
- CEE 635 Remediation Geotechnics (3 cr)
- CEE 627 Hydrogeology (4 cr)
- CEE 629 Contaminant Hydrogeology (3 cr)

Geo-Spatial Information Engineering

- CEE 301 Introduction to Aerial Photographic Systems (1 cr)
- CEE 302 Introduction 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 307 Fundamental Computations for Land Information Systems (1 cr)
- CEE 308 Spatial Reference Frameworks (1 cr)
- CEE 309 Intro to the Public Land Survey System (1 cr)
- CEE 357 Intro to Geomatics Analysis of Vertical Aerial Photographs (1 cr)
- CEE 556 Digital Image Processing (3 cr)
- CEE 656 Engineering Applications of Land and Geographic Information Systems (3 cr)

Structural Engineering

- CEE 442 Wood Design (3 cr)
- CEE 445 Steel Design (3 cr)
- CEE 447 Concrete Design (3 cr)
- CEE 440 Structural Analysis (3 cr)
- CEE 543 Precast Concrete (3 cr)
- CEE 545 Steel Design II (3 cr)
- CEE 547 Concrete Design II (3 cr)
- CEE 549 Structural Systems (3 cr)
- CEE 641 Highway Bridges (3 cr)

Transportation Engineering

- CEE 571 Urban Transportation Planning (3 cr)
- CEE 573 Geometric Design of Transport Facilities (3 cr)
- CEE 574 Traffic Control (3 cr)

Water Resources Engineering

- CEE 315 Hydrology (3 cr)
- CEE 316 Hydraulic Engineering (3 cr)
- CEE 411 Open Channel Flow (3 cr)
- CEE 412 Groundwater Hydraulics (3 cr)
- CEE 414 Hydrologic Design (3 cr)
- CEE 514 Coastal Engineering (3 cr)

Civil Engineering Technology

Associate in Applied Science Degree

Applied Engineer Technologies Cluster

Center for Agriscience & Technologies

Program offered at Madison Campus

For information call: (608) 246-6552 or (608) 246-6232
(800) 322-6282 Ext. 6552 or 6232

About the Program

This program trains technicians to assist civil engineers in planning, scheduling, designing, estimating, surveying and inspecting the construction of highways, bridges, buildings and other structures. Specific courses provide a student with the option for a career in land surveying.

Unique Requirements for Admission

High school course recommendations: We strongly recommend that students take the math sequence of Algebra 1 and Algebra 2 to best prepare them for this program. In addition, a high school physical science course is highly recommended. Students must earn a 2.0 (C) or better in the high school courses. Contact the Civil Engineering academic advisor at (608) 246-6232 for pre-registration advising.

The Civil Engineering Program participates in MAAP (Mandatory Assessment, Advising and Placement). This requires new students to complete the COMPASS or ASSET test. Advisement and course placement in English and math is done based on test results. Testing will be required prior to admission.

Curriculum

FIRST YEAR

		Credits	Hrs/week
			Lec-Lab
First Semester			
10-103-134	Windows	1	2.25-.75
10-103-137	Word-Beginning	1	2.25-.75
10-607-120	Methods in Civil Engineering	2	2-0
10-607-155	Survey 1	3	2-3
10-801-195	Written Communication	3	3-0
10-804-114	College Technical Math 1B	2	2-0
10-809-197	Contemporary American Society	3	3-0
10-809-199	Psychology of Human Relations	3	3-0
Semester Total		18	

Second Semester

10-103-133	Excel-Beginning	1	2.75-.75
10-607-147	Civil Drawing 1	2	1-3
10-607-149	Aggregates and Concrete	2	1-3
10-607-156	Survey 2	3	2-3
10-607-193	Career Development	1	1-0
10-804-116	College Technical Math 2	4	4-0
10-806-154	General Physics	4	3-1
Semester Total		17	

SECOND YEAR

First Semester

10-607-148	Civil Drawing 2	2	1-3
10-607-158	Survey 3	3	2-3
10-607-160	Soils	2	1-3
10-607-176	Site Hydraulics	2	1-2
10-607-177	Legal Elements of Engineering	2	2-0
10-801-197	Technical Reporting	3	3-0
	Elective	3	E
Semester Total		17	

Second Semester

10-607-133	Estimating	3	2-2
10-607-161	Project	3	1-6
10-607-171	Construction Materials	2	2-2
10-607-179	Introduction to GIS	2	1-1
10-809-195	Economics	3	3-0
	Elective	3	E
Semester Total		16	

Note: Students are assessed for correct placement in English or mathematics courses based on their scores on the COMPASS test or on completion of the appropriate prerequisite/s. Additionally, there may be courses in other subject areas that may use COMPASS scores as prerequisites when reading, writing, math, or critical thinking competencies are required.

Program Courses

10-607-120 Methods in Civil Engineering 2 credits
An introductory engineering course that familiarizes students with the civil engineering and construction processes from project concept to completion. Provides new students opportunity to develop and improve their problem-solving skills and prepare for subsequent technical courses.

10-607-133 Estimating 3 credits
Stresses estimating for general civil engineering work. Covers the preparation of detailed estimates as prepared by contractors for bidding purposes, the general estimate as prepared by engineers, and approximate estimates. Areas covered: highways, water and sewer lines, bridges, culverts, streets and general construction grading. Prerequisite: 10-607-177, fourth-semester standing or consent of instructor.

10-607-147 Civil Drawing 1 2 credits
Emphasis on development of graphical communication. Begins with basic manual drafting skills including line work, lettering, drafting tools use and free hand sketching of construction details. Transition in the last half of the semester to a CAD-based environment stressing geometric construction principles and simple engineering drawings. Corequisites: 10-607-155 and 10-103-134.

10-607-148 Civil Drawing 2 2 credits
Applications-oriented class with CAD emphasis. More complex drawing projects including mapping, roadway design elements and structural detail applications. Drawing organization and standards, data conversion and sharing, third-party add-ins. Prerequisite: 10-607-147 and 10-607-156.

10-607-149 Aggregates and Concrete 2 credits
Introduces the fundamental principles of aggregates, Portland cement concrete and bituminous concrete. Emphasizes standards-based sampling and testing in laboratory and field environments. Tests are performed according to standards set by the American Society for Testing and Materials (ASTM) and American Association of State Highway and Transportation Officials (AASHTO). Students communicate results in written reports. Prerequisites: 10-804-114 and 10-103-137.

10-607-155 Survey 1 3 credits
Basic measurement concepts, procedures, errors and computations underlying the technical aspects of surveying. Students use modern instrumentation to perform elevation, distance, and angular measurements. Coordinate geometry is introduced as a computational tool. Computations are done both manually and on computer using commercial software. Corequisites: 10-804-114, 10-607-120, and 10-103-134.

10-607-156 Survey 2 3 credits
Principles, computations and field methods, from design to stakeout, involved in three-dimensional curvilinear survey applications. AASHTO and WisDOT vertical and horizontal alignment standards; geometric and volumetric calculations. Field work reflecting different construction surveys are performed utilizing modern instrumentation. Prerequisite: 10-607-155. Corequisites: 10-607-147 and 10-804-116.

10-607-158 Survey 3 3 credits
Advanced concepts and procedures building on knowledge and skills attained in previous surveying classes. Concepts include geodetic applications, spatial reference systems, equipment adjustment, digital data collection and photogrammetry. Fieldwork includes total station calibration, control leveling, control network establishment and digital topographic data collection. Prerequisites: 10-607-156 and 10-607-147.

10-607-160 Soils 2 credits
Introduces the basic principles of soil mechanics and their application in engineering practice. Topics include soil composition and texture, subsurface investigation, classification, moisture-density relationships, permeability and seepage, consolidation, settlement, shear strength, lateral earth pressures, fundamentals of retaining structures, shallow and deep foundations, slope stability and erosion loss calculations. Prerequisites: 10-806-154, 10-607-149. Corequisite: 10-801-197.

10-607-161 Project 3 credits
Project-driven course through which civil engineering technicians gain firsthand experience with design by developing plans, specifications and reports for a "real-world" project while working in a team environment. Students present written and oral reports to reinforce technical communication skills. Prerequisites: 10-607-148, 10-607-158 and 10-607-176. Corequisite: 10-607-133.

10-607-171 Construction Materials 2 credits
Introduction to the design, specification and detailing of steel and reinforced concrete in typical civil engineering projects. Emphasis on infrastructural applications. Prerequisite: 10-607-160.

10-607-176 Site Hydraulics 2 credits
Basic concepts of hydraulics and hydrology, water resources, distribution systems and sewerage collection systems as applied to site development. Prerequisites: 10-607-149.

10-607-177 Legal Elements of Engineering 2 credits
Emphasizes contract relationships. The first half of the semester is spent studying the elements of a valid contract along with a study of the court system. The remainder of the semester concentrates on specifications, contracting procedure and the relationship between the three main parties involved in a construction contract: owner, engineer and contractor. Other topics include professional liability, professional ethics, product liability, discharge and remedies for non-completion. Prerequisite: third-semester standing or consent of instructor.

10-607-179 Introduction to GIS 2 credits
Basic terminology and components of geographic information systems. Capturing and organizing spatial data; integrating graphic and tabular information. Using spatial relationships to answer geographic queries. Civil engineering applications of GIS technology. Prerequisite: 10-607-147 or consent of instructor

10-607-193 Career Development 1 credit
Prepares students for work in a professional engineering environment by providing them with a knowledge and understanding of themselves and others. This course also guides students through the etiquette required for success in the job market and assists them in assembling the materials and information necessary for effective job applications and interviews. Prerequisites: 10-801-151 and 10-607-120.

Recommended Electives
10-607-180 Internship 1 credit
10-607-190 Special Problems 1 credit

Note: The following two elective courses allow students to meet educational requirements for land surveyor registration as defined in Chapter A-E 6.04 of the Wisconsin Administrative Code. Students interested in a career in Land Surveying should consider taking these courses:

10-607-168 Land Surveying 1 3 credits
10-607-175 Land Surveying 2 3 credits

Career Potential:

- Construction Inspector
- Survey Technician
- Civil CAD Technician
- Materials Testing Technician

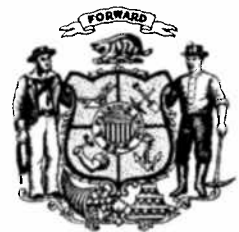
More detailed and updated information on this program may be available at: www.matcmadison.edu. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.

Madison Area Technical College provides equal opportunity in education and employment.

Rev. 11/07



WISCONSIN STATE LEGISLATURE



Kerry Knutson
431 West Hoxie Street
Spring Green, WI 53588

Date?

My name is Kerry Knutson, I was not able to attend the May 2nd 2007 public hearing for the proposed Assembly Bill 69. I am writing to voice/express my opposition to AB69. This bill will negatively impact myself and many other hard working individuals like myself.

I am going to give a brief description of my civil engineering background and work experience. In the spring of 1990 I receive an associates degree from Madison Area Technical College for Civil Engineering Technology, I began working for Westbrook Associated Engineers, Inc. located in Spring Green, Wi.. Westbrook is a civil engineering firm that has a work force that is roughly 50/50 in holding bachelors degrees vs. associates degrees. In approximately 1992 my supervisor at Westbrook, who also has an associate's degree from MATC Civil Engineering Technology program, had established to the Wisconsin Examining Board (Examining Board of Architects, Landscape Architects, Professional Engineers, Designers and Land Surveyors) that he had 12 plus year of engineering work experience and was approved to take the PE examination (Principles & Practice of Engineering examination). He passed the PE examination and was granted licensure. I have worked under the guidance and tutelage of Professional Engineers to attain the necessary experience and knowledge to take the PE examination and become a registered professional engineer. The Examining Board recently approved my engineering work experience allowing me to take the PE examination.

An article that was written and published by the Daily Reporter pertaining to the May 2nd hearing stated that a member of the Examining Board spoke giving examples of engineers with a bachelors degree taking the "experience only" route of obtaining licensure. The article went on to quote issues that the Examining Board had with the "experience only" route of obtaining licensure, however there was not any mention in the article of the fact that AB69 is also proposing to repeal statue 443.04 (1) (c) & reword statue 443.09 (5). Individuals applying for licensure under statue 443.04 (1) (c) do not fall into the "experience only" issues as quoted in the article stated above. Statue 443.04 (1) (c) requires an individual to obtain 12 years of engineering work experience and statue 443.09 (5) requires the individual applying for registration as a professional engineer under s. 443.04 (1) (c) to pass the PE examination to be eligible for registration as a professional engineer in the state of Wisconsin.

As stated in a paragraph of the statue 443.09 (5) "The examination for candidates under s. 443.04 (1) (c) shall be the principles and practice examination which requires the applicant to demonstrate the ability to apply engineering principles and judgment to problems in general engineering disciplines and to demonstrate knowledge"

I believe statues 443.04 (1) (c) & statue 443.09 (5) were intentionally and specifically written to allow hard working legitimately qualified individuals with similar engineering background as myself to have an opportunity to prove themselves in the engineering profession.

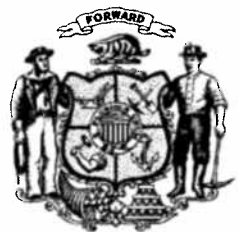
My situation may sound like a unique isolated case, but I assure you that it is not; as stated above one of my previous supervisors who also had an associates degree from MATC was trained and guided by Westbrook has obtaining a professional engineering registration. Currently there is another co-worker who also has an associate's degree from MATC and has been approved by the Examining Board to take the PE examination.

Again, I am opposed to AB69. I urge you to take into consideration that the proposed bill would have a very large negative impact to individuals like myself, who have invested significant amount of time and efforts in the advancement of their career in the pursuit of becoming a registered professional engineer.

Sincerely ,
Kerry Knutson



WISCONSIN STATE LEGISLATURE



WISCONSIN ASSEMBLY
2007-2008 SESSION
Speaker Huebsch

AB 69
 BY GOTTLIEB
 REQUIREMENTS FOR PROFESSIONAL ENGINEERS
TABLE AMENDMENT
 AA 1 OFFERED BY MOLEPSKE

AYES - 53 NAYS - 44 NOT VOTING - 2 PAIRED - 0

<u>A</u>	<u>N</u>	<u>NY</u>	<u>NAME</u>		<u>A</u>	<u>N</u>	<u>NY</u>	<u>NAME</u>		<u>A</u>	<u>N</u>	<u>NY</u>	<u>NAME</u>	
Y			ALBERS	R	Y			KESTELL	R		N		SCHNEIDER	D
Y			BALLWEG	R	Y			KLEEFISCH	R			x	SEIDEL	D
	N		BENEDICT	D	Y			KRAMER	R		N		SHERIDAN	D
	N		BERCEAU	D		N		KREUSER	D	Y			SHERMAN	D
Y			BIES	R		N		KRUSICK	D		N		SHILLING	D
Y			BLACK	D		N		LASEE	R		N		SINICKI	D
	N		BOYLE	D	Y			LEMAHIEU	R		N		SMITH	D
	N		COLON	D	Y			LOTHIAN	R		N		SOLETSKI	D
	N		CULLEN	D		N		MASON	D	Y			STASKUNAS	D
Y			DAVIS	R	Y			MEYER	R		N		STEINBRINK	D
	N		FIELDS	D		N		MOLEPSKE	D	Y			STONE	R
Y			FITZGERALD	R	Y			MONTGOMERY	R	Y			STRACHOTA	R
Y			FRISKE	R	Y			MOULTON	R	Y			SUDER	R
	N		GARTHWAITE	D	Y			MURSAU	R	Y			TAUCHEN	R
Y			GOTTLIEB	R	Y			MURTHA	R		N		TOLES	D
	N		GRIGSBY	D	Y			MUSSER	R			x	TOWNSEND	R
	N		GRONEMUS	D		N		NASS	R		N		TRAVIS	D
Y			GUNDERSON	R		N		NELSON	D		N		TURNER	D
Y			GUNDRUM	R	Y			NERISON	R		N		VAN AKKEREN	D
Y			HAHN	R	Y			NEWCOMER	R	Y			VAN ROY	R
	N		HEBL	D	Y			NYGREN	R	Y			VOS	R
	N		HILGENBERG	D	Y			OTT, A.	R		N		VRUWINK	D
Y			HINES	R	Y			OTT, J.	R	Y			VUKMIR	R
	N		HINTZ	D	Y			OWENS	R		N		WASSERMAN	D
Y			HIXSON	D		N		PARISI	D	Y			WIECKERT	R
Y			HONADEL	R	Y			PETERSEN	R		N		WILLIAMS, A.	D
	N		HRAYCHUCK	D	Y			PETROWSKI	R	Y			WILLIAMS, M.	R
	N		HUBLER	D		N		POCAN	D		N		WOOD	R
Y			JESKEWITZ	R	Y			POPE-ROBERTS	D		N		YOUNG	D
	N		JORGENSEN	D	Y			PRIDEMORE	R		N		ZEPNICK	D
Y			KAUFERT	R	Y			RHOADES	R		N		ZIEGELBAUER	D
Y			KERKMAN	R		N		RICHARDS	D	Y			ZIPPERER	R
	N		KESSLER	D	Y			ROTH	R	Y			SPEAKER	R

IN CHAIR: FRISKE

NO VACANT DISTRICTS

SEQUENCE NO. 122
 Tuesday, November 06, 2007
 5:15 PM

WISCONSIN ASSEMBLY
2007-2008 SESSION
Speaker Huebsch

AB 69
 BY GOTTLIEB
 REQUIREMENTS FOR PROFESSIONAL ENGINEERS
SUSPEND RULES FOR THIRD READING

AYES - 51 NAYS - 46 NOT VOTING - 2 PAIRED - 0

<u>A</u>	<u>N</u>	<u>NY</u>	<u>NAME</u>		<u>A</u>	<u>N</u>	<u>NY</u>	<u>NAME</u>		<u>A</u>	<u>N</u>	<u>NY</u>	<u>NAME</u>	
Y			ALBERS	R	Y			KESTELL	R		N		SCHNEIDER	D
Y			BALLWEG	R	Y			KLEEFISCH	R		x		SEIDEL	D
	N		BENEDICT	D	Y			KRAMER	R		N		SHERIDAN	D
	N		BERCEAU	D		N		KREUSER	D		N		SHERMAN	D
Y			BIES	R		N		KRUSICK	D		N		SHILLING	D
	N		BLACK	D	Y			LASEE	R		N		SINICKI	D
	N		BOYLE	D	Y			LEMAHIEU	R		N		SMITH	D
	N		COLON	D	Y			LOTHIAN	R		N		SOLETSKI	D
	N		CULLEN	D		N		MASON	D		N		STASKUNAS	D
Y			DAVIS	R	Y			MEYER	R		N		STEINBRINK	D
	N		FIELDS	D		N		MOLEPSKE	D	Y			STONE	R
Y			FITZGERALD	R	Y			MONTGOMERY	R	Y			STRACHOTA	R
Y			FRISKE	R	Y			MOULTON	R	Y			SUDER	R
	N		GARTHWAITE	D	Y			MURSAU	R	Y			TAUCHEN	R
Y			GOTTLIEB	R	Y			MURTHA	R		N		TOLES	D
	N		GRIGSBY	D	Y			MUSSER	R		x		TOWNSEND	R
	N		GRONEMUS	D	Y			NASS	R		N		TRAVIS	D
Y			GUNDERSON	R		N		NELSON	D		N		TURNER	D
Y			GUNDRUM	R	Y			NERISON	R		N		VAN AKKEREN	D
Y			HAHN	R	Y			NEWCOMER	R	Y			VAN ROY	R
	N		HEBL	D	Y			NYGREN	R	Y			VOS	R
	N		HILGENBERG	D	Y			OTT, A.	R		N		VRUWINK	D
Y			HINES	R	Y			OTT, J.	R	Y			VUKMIR	R
	N		HINTZ	D	Y			OWENS	R		N		WASSERMAN	D
	N		HIXSON	D		N		PARISI	D	Y			WIECKERT	R
Y			HONADEL	R	Y			PETERSEN	R		N		WILLIAMS, A.	D
	N		HRAYCHUCK	D	Y			PETROWSKI	R	Y			WILLIAMS, M.	R
	N		HUBLER	D		N		POCAN	D	Y			WOOD	R
Y			JESKEWITZ	R		N		POPE-ROBERTS	D		N		YOUNG	D
	N		JORGENSEN	D	Y			PRIDEMORE	R		N		ZEPNICK	D
Y			KAUFERT	R	Y			RHOADES	R		N		ZIEGELBAUER	D
Y			KERKMAN	R		N		RICHARDS	D	Y			ZIPPERER	R
	N		KESSLER	D	Y			ROTH	R	Y			SPEAKER	R

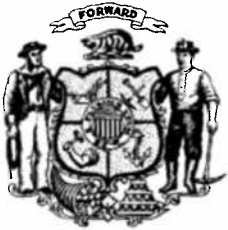
IN CHAIR: FRISKE

NO VACANT DISTRICTS

SEQUENCE NO. 123
 Tuesday, November 06, 2007
 5:16 PM



WISCONSIN STATE LEGISLATURE



- ▶ Home
- ▶ Lobbying in Wisconsin
- ▶ Organizations employing lobbyists
- ▶ Lobbyists



as of Monday, March 03, 2008

2007-2008 legislative session
Legislative bills and resolutions

(search for another legislative bill or resolution at the bottom of this page)

Assembly Bill 69

registration requirements for professional engineers. (FE)

TEXT sponsors LBR analysis	STATUS committee actions and votes text of amendments	COST & HOURS of lobbying efforts directed at this proposal
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Organization		These organizations have reported lobbying on this proposal:	Place pointer on icon to display comments, click icon to display prior comments		
Profile	Interests		Date Notified	Position	Comments
⊙	⊙	American Council of Engineering Companies of Wisconsin	2/23/2007	↑	
⊙	⊙	Milwaukee Area Technical College	5/31/2007	↔	
⊙	⊙	Wisconsin Builders Association	2/23/2007	↔	
⊙	⊙	Wisconsin Technical College District Boards Association Inc	6/6/2007	?	
⊙	⊙	Wisconsin Transportation Builders Association	5/17/2007	↑	

Select a legislative proposal and click "go"

House	<div style="background-color: black; color: white; padding: 2px;">Assembly</div> <div style="padding: 2px;">Senate</div>
Proposal Type	<div style="background-color: black; color: white; padding: 2px;">Bill</div> <div style="padding: 2px;">Joint Resolution</div> <div style="padding: 2px;">Resolution</div>
Proposal Number	69 (enter proposal number)
Legislative Session	2007 Regular Session ▼
	<input type="button" value="Go"/>