CE Program Outcomes and Educational Objectives

Outcome	Current Description	Educational Objectives based on Bloom's Taxonomy
A	The graduates can apply knowledge in mathematics through differential equations; calculus-based physics; and general chemistry, and at least one additional area of science. The graduates are also able to apply probability and statistics to address uncertainty	**Application**
B	The graduates can analyze and solve problems in a minimum of four (4) recognized major CE areas.	**Analysis**
C	The graduates have the ability to conduct laboratory experiments and to critically analyze and interpret data in at least two technical areas of CE.	**Analysis**
D	The graduates have the ability to perform CE design in at least two civil engineering contexts by means of design experiences integrated throughout the professional component of the curriculum. The graduates have the ability to include principles of sustainability in design.	**Synthesis**
E	The graduates have an understanding of professional practice issues such as: procurement of work; bidding versus quality based selection processes; how the design professionals and the construction professions interact to construct a project; the importance of professional licensure and continuing education; and/or other professional practice issues.	**Comprehension**
F	The graduates have an understanding of the basic concepts in project management, business, public policy, and leadership through discussion in different courses.	**Comprehension**

Mapping of Courses to Civil Specific Program Outcomes February 24, 2016

Civil Specific Program Outcomes	A	B	C	D	E	F
MATH 1850 Calculus I MATH 1860 Calculus II	C C					
MATH 2850 Calculus III	C					
MATH 2890 Num Methods & Lin Algebra	A					
MATH 3860 Differential Equations	C					
CHEM 1230 General Chemistry I	C					
*CHEM 1280 General Chemistry Lab I	A		C			
PHYS 2130 Physics I PHYS 2140 Physics II	A A		C C			
ENGL 1110 College Composition I						
ENGL 2900 or 2950 Report Writing						
CIVE 1000 Freshman CE Experience		K	C (dropped)	K	K	K
*EECS 1050 Intro to Computing in C/C++	A					
CIVE 1100 CE Measurements	A		AN	C		
CIVE 1110 Computer Aided Drafting	A					
CIVE 1150 Engineering Mechanics - Statics	A					
CIVE 1160 Engineering Mechanics - Strength of Materials	A					
CIVE 1170 Fluid Mechanics for CE's	A					
CIVE 2000 Professional Development						
CIVE 2110 Civil Engineering Materials with Lab	A		AN	A		
MIME 2300 Engineering Dynamics	A					
MIME 2600 Engineering Economics	A				C	
CIVE 3120 CE Systems Analysis	A					
CIVE 3210 Soil Mechanics	A	AN / 1	AN / 1			
CIVE 3220 Foundation Engineering	A	AN / 1		S		
CIVE 3310 Structural Analysis	A	AN / 3				
CIVE 3410 Steel Design I	A	AN / 3		S		
CIVE 3420 Reinforced Concrete Design I	A	A / 3		S		
CIVE 3510 Transportation Engineering I	A	AN / 2				
CIVE 3520 Transportation Engineering II	A	AN / 2		A		
CIVE 3610 Water Supply & Treatment	A	AN / 4	AN / 4	S		C
CIVE 3620 Air Pollution Engineering I	A	AN / 4		S		C
CIVE 3630 Waste Water Engineering	A	AN / 4	AN / 4	S		C
MIME 4000 Engineering Statistics I	C					
CIVE 4750 Senior Design Project	A	AN / 1 - 4		S	C	C
MIME 1650 Materials Eng. and Lab **OR** MIME 3400 Intro to Thermal Science **OR** EECS 2340 Elec. Circuits for Non-majors	A					
University core curriculum in Humanities, Social Sciences and Multicultural Studies						
Approved Civil Engrg. technical electives	A					

Key: K = Knowledge, C = Comprehension, A = Application, AN = Analysis, S = Synthesis, E = Evaluation, X/1 = Geotechnical, X/2 = Transportation, X/3 = Structural, X/4 = Environmental (this shows which courses fall in the required four major areas and which areas the lab components are in.)

* No longer available to students entering from fall 2008

ABET Engineering Program Outcomes

Outcome	Description	Educational Objectives based on Bloom's Taxonomy
a	The graduates have an ability to apply knowledge of mathematics, science, and engineering.	**Application**
b	The graduates have an ability to design and conduct experiments, as well as to analyze and interpret data.	**Analysis**
c	The graduates have an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.	**Synthesis**
d	The graduates have an ability to function on multidisciplinary teams.	**Application**
e	The graduates have an ability to identify, formulate, and solve engineering problems.	**Analysis**
f	The graduates have an understanding of professional and ethical responsibility.	**Analysis**
g	The graduates have an ability to communicate effectively.	**Analysis**
h	The graduates have the broad education necessary to understand the impact of engineering solutions in a global and societal context.	**Application**
i	The graduates have a recognition and the need for, and an ability to engage, in life-long learning.	**Application**
j	The graduates have a knowledge of contemporary issues.	**Application**
k	The graduates have an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	**Application**

Mapping of Courses to ABET's a-k. April 23, 2016

Outcome Objectives	a	b	c	d	e	f	g	h	i	j	k
MATH 1850 Calculus I MATH 1860 Calculus II	K C										
MATH 2850 Calculus III	A										
MATH 2890 Num Methods & Lin Algebra	A										
MATH 3860 Differential Equations	A										
CHEM 1230 General Chemistry I	A										
*CHEM 1280 General Chemistry Lab I	A	K									
PHYS 2130 Physics I PHYS 2140 Physics II	K A	K A									
ENGL 1110 College Composition I							K				
ENGL 2900 or 2950 Report Writing							K				
CIVE 1000 Freshman CE Experience			K	K	K	K	A	K	K	K	A
EECS 1050 Intro to Computing in C/C++	A										C
CIVE 1100 Measurements for CE's	A		A	A	A						A
CIVE 1110 Computer Aided Drafting	**A**		**A**								**A**
CIVE 1150 Engineering Mechanics - Statics	A				AN						
CIVE 1160 Engineering Mechanics - Strength of Materials	A				AN						
CIVE 1170 Fluid Mechanics for CE's	A				A		A	K**			
CIVE 2000 Professional Development						C	C	C	C	C	
CIVE 2110 Civil Engineering Materials with Lab	A	A	A	A	A		A				A
MIME 2300 Engineering Dynamics	A				AN						
MIME 2600 Engineering Economics	A				AN			A			A
CIVE 3120 CE Systems Analysis	A				A						A
CIVE 3210 Soil Mechanics	A	A		A	A		A				
CIVE 3220 Foundation Engineering	A		C		A						A
CIVE 3310 Structural Analysis	A										x C
CIVE 3410 Steel Design I	A		A		A						A
CIVE 3420 Reinforced Concrete Design I	A		A		A						A
CIVE 3510 Transportation Engineering I	A				A						
CIVE 3520 Transportation Engineering II	A		A		A						A
CIVE 3610 Water Supply & Treatment	A	AN	C	A	AN		A				A
CIVE 3620 Air Pollution Engineering I	A		A		A						A
CIVE 3630 Waste Water Engineering	A		**A**	A	AN		A	**C**			A
MIME 4000 Engineering Statistics I	A										A
CIVE 4750 Senior Design Project	A		S	A	A	A	A	A	A	A	A
MIME 1650 Materials Eng. and Lab **OR** MIME 3400 Intro to Thermal Science **OR** EECS 2340 Elec. Circuits for Non-majors	A										
University core curriculum in Humanities, Social Sciences and Multicultural Studies								K		A	
Approved Civil Eng. technical electives	A				A						A

Key: K = Knowledge, C = Comprehension, A = Application, AN = Analysis, S = Synthesis, E = Evaluation

* No longer available to students entering from fall 2008

** Added on May 25, 2011 after the instructor reported that the course was taught using this outcome.