41-03

Engineering Faculty Document No. XX-XX
January 10, 2012

TO: The Faculty of the Schools of Engineering
FROM: The Faculty of the Division of Construction Engineering and Management
DATE: January 10, 2012
SUBJECT: Change of Course Requirement for the Degree of Bachelor of Science in Construction Engineering

The Faculty of the Division of Construction Engineering and Management has approved # modifications to the curriculum for the Bachelor of Science in Construction Engineering, last approved as EFD 41-03, resulting in no change in the total of 134 credit hours required for the degree. This action is now submitted to the Engineering Faculty with a recommendation for approval.

Current and proposed plans of study are attached. Detailed descriptions of proposed changes are provided along with reasons for these proposed changes.

Brandon working on submittal 1-12-12

Curriculum, as established under EFD #41-03, is to be updated with this action to reflect the necessary evolution of the academic environment and internal/external reviews. Reasons for the proposed changes to the curriculum are explained below:

Change 1: Removed Specialty Areas of Emphasis from the Plan of Study.
Reason: ABET audit requirement.

Change 2: Added information related to the First Year Engineering Plan of Study.
Reason: Define required and accepted courses specific to the Construction Engineering Plan of Study that First Year Engineering (FYE) students enrolling in Construction Engineering and Management must successfully complete.

Change 3: Third Semester added note f.
Reason: Identification of preapproved course substitution for students who select a Mechanical Engineering Minor.

Change 4: Third Semester added CEM 201 and deleted CE 220.
Reason: CEM 201 replaced CE 220 course via EFD #40-09.

Change 5: Third Semester added note g to CGT 164.
Reason: Identification of preapproved course substitution for students who select a Mechanical Engineering Minor.

Change 6: Third Semester added general education elective and increased from 16hrs to 19hrs the total semester credit hours.
Reason: CEM Division review of course loads and adjustments to sequences.

Change 7: Fourth semester added MGMT 200 and added note i.
Reason: CEM Division review of course loads and adjustments to sequences moved this course from the sixth semester. Note i included to address course offering adjustments made to MGMT 200.

Change 8: Fourth semester added CE 231 and deleted CE 333.
Reason: CEM Division review of course loads and adjustment to sequences.

Change 9: Fourth semester adjusted CEM 290 to represent 1 credit hour.
Reason: CEM Division adjusted content via EFD #21-10.

Change 10: Fourth semester deleted CE 221.
Reason: CE 220, CE 221 & CE 321 series replaced by CEM 201, CEM 301 & CEM 302 via EFD's #40-09, #41-09 and #42-09.

Change 11: Increased total semester credit hours to 17hrs.
Reason: CEM 290 offering adjustment and CEM Division review of course sequences.

Change 12: Fifth Semester added note j.
Reason: Identification of preapproved course substitution for students who select a Mechanical Engineering Minor.

Change 13: Fifth Semester added CEM 301 and deleted CE 321.
Reason: CEM 301 replaced CE 321 course via EFD's #41-09 and #42-09.

Change 14: Fifth Semester added CE 398 and deleted CE 399.
Reason: CE 399 course eliminated and content absorbed in CEM 290 as well as added emphasis in core courses regarding written and oral communication.

Change 15: Fifth Semester added CEM 497 (Materials Lab).
Reason: In conjunction with change 8 above provides the additional material required for CEM curriculum.

Change 16: Fifth Semester removed general education elective and decreased from 18hrs to 15hrs the total semester credit hours.
Reason: CEM Division review of course loads and adjustments to sequences.

Change 17: Sixth Semester added CE 340/CE 343, CE 371 and CE 383.
Reason: CEM Division review of Technical Elective courses and determined that the previous curriculum undefined 10hrs of Technical Elective courses should be listed to promote specific outcomes.

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Makarand Hastak, Head
Division of Construction Engineering and Management

Curriculum in Construction Engineering – Current Plan of Study (per EFD #41-03)

Credit Hours Required for Graduation: 134

	Credit Hours
Mathematics and Physical Sciences:	
Calculus: MA 165, 166, 261, 265, 266	**18**
Stochastics: STAT 511	**3**
Chemistry: CHM 115, 116	**8**
Physics: PHYS 152, 241	**7**
Computing:	
ENGR 106, CS 156, CGT 164	**6**
Seminars:	
ENGR 100, CEM 290	**1**
Communication and General Education:	
English Composition:	**3**
Speech: COM 114	**3**
Technical Communication: CE 399	**3**
Humanities and Social Sciences: Courses are selected according to an approved list with the help of a faculty advisor.	**18**
Core Engineering Courses:	
Surveying: CE 203	**4**
Basic Mechanics/Materials: CE 333, 270, 297, 298	**13**
Thermodynamics: ME 200	**3**
Construction: CE 220, 221,321, 424, 521, 524	**18**
Final Design Project: CE 425 This course must be taken during the student's final fall semester.	**3** **3**
Management Course:	
Management: MGMT 200	**3**
Technical Electives:	
Courses are selected with the help of a faculty advisor to accommodate the student's professional goals and to provide the student with sufficient design background.	**20**

Plan of Study for Construction Engineering – Current (per EFD #41-03)

Credit Hours Required for Graduation: 134

Freshman Year (See First Year Engineering Plan of Study)

Summer Session

(0) CEM 191 (Construction Internship I)

Sophomore Year

Third Semester	Fourth Semester
(4) CE 203 (Fundamentals of Surveying)	(3) CE 221 (Construction Plans and Estimates) 301
(3) CE 220 (Construction Management) -201	(4) CE 270 (Introductory Structural Mechanics)
(3) CE 297 (Basic Mechanics I: Statics)	(3) CE 333 (Engineering Materials)
(4) MA 261 (Multivariate Calculus)	(3) PHYS 241 (Electricity and Optics)
(2) CGT 164 (Graphics for Civil Engineers and Construction)	(3) MA 265 (Linear Algebra)
	1 (0) CEM 290 (Construction Seminar)
(16)	(16)

Summer Session

(0) CEM 291 (Construction Internship II

Junior Year

Fifth Semester	Sixth Semester
2(3) CE 399 (Oral and Written Communications for Civil Engineers	(3) MGMT 200 (Introductory Accounting)
302 (3) CE 321 (Construction Planning and Scheduling)	(3) ME 200 (Thermodynamics)
(3) CE 298 (Basic Mechanics II: Dynamics)	(10) Technical Elective**
(3) STAT 511 (Statistical Methods)	(3) General education elective*
(3) MA 266 (Ordinary Differential Equations)	
(3) General education elective*	(3) CE 398
(18)	(19)

Summer Session

(0) CEM 391 (Construction Internship III)

Senior Year

Seventh Semester	Eighth Semester
324 (3) CE 424 (Human Resource Management in Construction)	(3) CE 524 (Legal Aspects in Engineering Practice)
CEM (3) CE 425 (Construction Practice Project)	(6) Technical Elective**
(3) CE 521 (Construction Business Management)	(6) General education elective*
(4) Technical Elective**	
(6) General education elective*	
(19)	(15)

*Eighteen credit hours of general education electives are chosen in accordance with the general education requirement of the Schools of Engineering.

**Technical electives vary depending on the specialty area of interest and career objectives. A list of acceptable technical electives is available from the CEM Division.

Specialty Areas of Emphasis
Candidates for the Bachelor of Science in Construction Engineering and Management degree are to select technical electives within the specialty areas of emphasis according to the following guidelines:

Building/Heavy Highway Construction Specialty
(3) CE 340 (Hydraulics)
(1) CE 344 (Drainage Design Laboratory)
(3) CE 371 (Structural Analysis I)
(3) CE 383 (Geotechnical Engineering I)
(4) CE 473 (Theory of Reinforced Concrete)
Plus at least 6 credits from the current approved technical electives list available from the CEM Division.

Electrical Construction Specialty
(3) EE 201 (Linear Circuit Analysis I)
(1) EE 207 (Electronic Measurement Techniques)
(3) EE 432 (Elements of Power System Engineering)
Plus at least 12 credits from the current approved technical electives list available from the CEM Division.

Mechanical Construction Specialty
(3) EE 201 (Linear Circuit Analysis I)
(3) ME 309 (Fluid Mechanics)
Plus at least 12 credits from the current approved technical electives list available from the CEM Division.

Curriculum in Construction Engineering – Proposed Plan of Study

Credit Hours Required for Graduation: 134

	Credit Hours
Mathematics and Physical Sciences:	
Calculus: MA 165, 166, 261, 265, 266	18
Stochastics: STAT 511	3
Chemistry: CHM 115, 116	8
Physics: PHYS 152, 241	7
Computing:	
ENGR 106, CS 156, CGT 164	6
Seminars:	
ENGR 100, CEM 290	1
Communication and General Education:	
English Composition:	3
Speech: COM 114	3
Technical Communication: CE 399	3
Humanities and Social Sciences: Courses are selected according to an approved list with the help of a faculty advisor.	18
Core Engineering Courses:	
Surveying: CE 203	4
Basic Mechanics/Materials: CE 333, 270, 297, 298	13
Thermodynamics: ME 200	3
Construction: CE 220, 221,321, 424, 521, 524	18
Final Design Project: CE 425 This course must be taken during	3
the student's final fall semester.	3
Management Course:	
Management: MGMT 200	3
Technical Electives: Courses are selected with the help of a faculty advisor to accommodate the student's professional goals and to provide the student with sufficient design background.	20

Plan of Study for Construction Engineering – Proposed

Credit Hours Required for Graduation: 134

Freshman Year (See First Year Engineering Plan of Study for Additional Information)

First Semester	Second Semester
(4) MA 165[a] (Analytic Geometry & Calculus I)	(4) MA 166[a] (Analytic Geometry & Calculus II)
(4) CHM 115[b] (General Chemistry)	(3) Science Selective[d]
(3) ENGL 106[c] (First Year Composition)	(3) First Year General Education Elective[e]
(2) ENGR 131 (Transforming Ideas to Innovations I)	(2) ENGR 132 (Transforming Ideas to Innovation II)
	(4) PHYS 172 (Modern Mechanics)
(13)	(16)

Summer Session

(0) CEM 191 (Construction Internship I)

Sophomore Year

Third Semester	Fourth Semester
(4) MA 261 (Multivariate Calculus)	(3) MA 265 (Linear Algebra)
(3) CE 297[f] (Basic Mechanics I: Statics)	(4) CE 270 (Introductory Structural Mechanics)
(3) CEM 201 (Life Cycle Engineering and Management of Constructed Facilities)	(3) MGMT 200[i] (Introductory Accounting)
	(3) CE 231 (Engineering Materials I)
(4) CE 203 (Principles and Practice of Geomatics)	(3) PHYS 241 (Electricity and Optics)
(2) CGT 164[g] (Graphics for Civil Engineering and Construction)	(1) CEM 290 (Construction Engineering Seminar)
(3) General education elective[h]	
(19)	(17)

Summer Session

(0) CEM 291 (Construction Internship II

Notes:

[a] MA161 & MA 162 may be taken as respective substitute courses (only 4hrs count toward graduation requirements).

[b] CHM 111and CHM 112 combined may be taken as substitute course (only 4hrs count toward graduation requirements).

[c] ENGL 108 may be taken as a substitute course (only 3hrs count toward graduation requirements).

[d] Division of Construction Engineering and Management will accept either CS 159 or CHM 116 to fulfill the FYE Science Selective requirement (only 3hrs count toward graduation requirements). BIOL is not accepted. Note that ENGR 195H I &II are accepted as substitute courses for ENGR 131, ENGR 132 and the Science Selective.

[e] Division of Construction Engineering and Management requires COM 114.

[f] ME 270 may be taken as a substitute course.

[g] CGT 163 may be taken as a substitute course for students who select a Mechanical Engineering Minor.

[h] General education electives (18hrs) must be selected and obtained in accordance with the general education requirements of the Schools of Engineering. Preapproved course listing may be obtained from the CEM Division.

[i] CEM Students are required to take the Management Major sections of this course.

Plan of Study for Construction Engineering – Proposed (continued)

Junior Year

Fifth Semester	Sixth Semester
(3) MA 266 (Ordinary Differential Equations)	(3) ME 200 (Thermodynamics I)
(3) CE 298[j] (Basic Mechanics II: Dynamics)	(4) CE 340/CE 343 (Hydraulics & Elem. Hydraulics Lab)
(3) STAT 511 (Statistical Methods)	(3) CE 371 (Structural Analysis I)
(3) CEM 301 (Project Control and Life Cycle Execution of Constructed Facilities)	(3) CE 383 (Geotechnical Engineering I)
	(3) CEM 302 (Practical Applications for Construction Eng)
(3) CE 398 (Introduction to Civil Engineering Systems Design)	(3) General education elective[h]
(1) CEM 497 (Materials Lab)	
(16)	(19)

Summer Session

(0) CEM 391 (Construction Internship III)

Senior Year

Seventh Semester	Eighth Semester
(3) CE 424 (Human Resource Management in Construction)	(3) CE 524 (Legal Aspects in Engineering Practice)
(3) CE 425 (Construction Practice Project)	(6) Technical Elective**
(3) CE 521 (Construction Business Management)	(6) General education elective*
(4) Technical Elective**	
(6) General education elective*	
(19)	(15)