DEGREE/PROGRAM CHANGE
FORM C
Form Number: C1509

Fields marked with * are required

Name of Initiator: Mark Daniel Russell **Email:** russ1307@unm.edu **Phone Number:** 505 277-1948
Date: 10-24-2014

Associated Forms exist? Yes Initiator's Title Lecturer II: Civil Engineering Civil Engr

Faculty Contact Mark Russell Administrative Contact Nicole Bingham
Department Civil Engineering Admin Email nicluna@unm.edu
Branch Admin Phone 277-6633

Proposed effective term
Semester Fall Year 2015

Course Information

Select Appropriate Program Undergraduate Degree Program
Name of New or Existing Program BS Construction Engineering
Select Category Major Degree Type BS
Select Action Revision

Exact Title and Requirements as they should appear in the catalog. If there is a change, upload current and proposed requirements.
See current catalog for format within the respective college (upload a doc/pdf file)

Construction_Engineering_Curriculum_proposal_5_Dec_14[1].docx

☐ **Does this change affect other departmental program/branch campuses? If yes, indicate below.**

Reason(s) for Request (enter text below or upload a doc/pdf file)
To improve course offering efficiency.

Construction Engineering Curriculum justification 23 Oct 14.docx

Upload a document that inlcudes justification for the program, impact on long-range planning, detailed budget analysis and faculty workload implications.(upload a doc/pdf file)

Workload for Construction Engineering 23 Oct 14.docx

☐ **Are you proposing a new undergraduate degree or new undergraduate certificate? If yes, upload the following documents.**

Upload a two-page Executive Summary authorized by Associate Provost. (upload a doc/pdf file)

Upload memo from Associate Provost authorizing go-ahead to full proposal. (upload a doc/pdf file)

December 5, 2014

Proposal for change to Civil Engineering undergraduate curriculum

A revised curriculum sheet is provided on the next sheet to illustrate how this proposal could be implemented. The total hours for the proposed curriculum is 124 hours.

Current

Bachelor of Science in Construction Engineering

The Bachelor of Science in Construction Engineering (B.S.Cn.E.) is accredited by the Engineering Accreditation Commission of ABET. The **Educational Objectives** of the Construction Engineering program are:

1. Prepare our graduates for successful professional practice or advanced study in construction engineering.
2. Provide our graduates with a broad education as a foundation for professional licensure and life-long learning.
3. Produce graduates with an appreciation for social, economic and ethical issues related to construction engineering.

Curriculum

Credit hours required for graduation: 130 or 131

First Year	First Semester	Credit Hours
ENGL 110 (*or* ENGL 112; *or* ENGL 113)	Accelerated Composition (*or* Composition II; *or* Enhanced Composition) (1)	3
MATH 162	Calculus I (1)	4
CHEM 121	General Chemistry (1)	3
CHEM 123L	General Chemistry Lab (1)	1
CE 160L	Civil Engineering Design	3
	Core Humanities Elective	3

		17
	Second Semester	
ENGL 120	Composition III [(1)]	3
MATH 163	Calculus II	4
CS 151L	Computer Programming Fundamentals for Non-Majors Lab	3
PHYC 160	General Physics [(1)]	3
EPS 101	Introduction to Geology [(1)]	3
-or-		
CHEM 122	General Chemistry [(1)]	3
CHEM 124L	General Chemistry Lab [(1)]	1
		16-17
Second Year	**First Semester**	
MATH 264	Calculus III	4
PHYC 161	General Physics	3
CE 202	Engineering Statics	3

ECON 105 *-or-* ECON 106	Introductory Macroeconomics [(1)] Introductory Microeconomics [(1)]	3
	Core Humanities Elective	3
		16
	Second Semester	
MATH 316	Applied Ordinary Differential Equations	3
MGMT 202	Principles of Financial Accounting	3
ME 306	Dynamics	3
ENGL 219	Technical and Professional Writing [(1)]	3
	Core Fine Arts Elective	3
		15
Third Year	**First Semester**	
CE 302	Mechanics of Materials	3
CE 305	Infrastructure Materials Science	4
CE 283	Transportation System Measurements	3

CE 350	Engineering Economy	3
CE 376	Cost Estimating	3
		16
	Second Semester	
CE 308	Structural Analysis	3
CE 360L	Soil Mechanics/Lab	4
CE 370	Construction Methods and Equipment	3
CE 377	Construction Scheduling	3
	Core Second Language Elective	3
		16
Fourth Year [2]	**First Semester**	
CE 331L	Fluid Mechanics/Lab	4
CE 354 *-or-* STAT **345	Probability and Statistics in CE Elements of Mathematical Statistics and Probability Theory	3
CE 455	Engineering Project Management	3

CE 477	Project Controls	3
CE 495	Construction Internship	1
	Technical Elective [3]	4
		18
	Second Semester	
CE 409	Engineering Ethics	1
CE 473	Construction Law [1]	3
CE 475	Construction Safety [1]	3
CE 499L	Design of CE Systems	3
	Engineering Science elective: ECE 203 or ME 301	3
	Core Social/Behavioral Science Elective [1]	3
		16

Notes:

[1] Specific Core Curriculum requirements.

[2] Students must take the Fundamentals of Engineering Exam prior to graduation.

[3] See advisor for a list of approved technical electives.

Proposed

Bachelor of Science in Construction Engineering

The Bachelor of Science in Construction Engineering (B.S.Cn.E.) is accredited by the Engineering Accreditation Commission of ABET. The **Educational Objectives** of the Construction Engineering program are:

4. Prepare our graduates for successful professional practice or advanced study in construction engineering.
5. Provide our graduates with a broad education as a foundation for professional licensure and life-long learning.
6. Produce graduates with an appreciation for social, economic and ethical issues related to construction engineering.

Curriculum

Credit hours required for graduation: 125

First Year	**First Semester**	**Credit Hours**
ENGL 110 (*or* ENGL 112; *or* ENGL 113)	Accelerated Composition (*or* Composition II; *or* Enhanced Composition) (1)	3
MATH 162	Calculus I (1)	4
CHEM 121	General Chemistry (1)	3
CHEM 123L	General Chemistry Lab (1)	1
CE 160L	Civil Engineering Design	3
		14
	Second Semester	
ENGL 120	Composition III (1)	3
MATH 163	Calculus II	4

CS 151L	Computer Programming Fundamentals for Non-Majors Lab	3
PHYC 160	General Physics [(1)]	3
BIOL 110 *-or-* EPS 101	Biology Non-Majors How the Earth Works-An Introduction to Geology	3
		16
Second Year	**First Semester**	
MATH 264	Calculus III	4
PHYC 161	General Physics	3
CE 202	Engineering Statics	3
CE 283	Transportation System Measurements	3
ECON 105 *-or-* ECON 106	Introductory Macroeconomics [(1)] Introductory Microeconomics [(1)]	3
		16
	Second Semester	
MATH 316	Applied Ordinary Differential Equations	3
MGMT 202	Principles of Financial Accounting	3

ENGL 219	Technical and Professional Writing [1]	3
ENG 302	Fundamentals of Engineering: Electronic Circuits	1
ENG 303	Fundamentals of Engineering: Thermodynamics	1
ENG 301	Fundamentals of Engineering: Dynamics	1
	Core Humanities Elective	3
		15
Third Year	**First Semester**	
CE 302	Mechanics of Materials	3
CE 305	Infrastructure Materials Science	4
CE 350	Engineering Economy	3
CE 376	Cost Estimating	3
	Core Humanities Elective	3
		16
	Second Semester	
CE 308	Structural Analysis	3

STAT 345	Elements of Mathematical Statistics and Probability Theory	3
CE 360L	Soil Mechanics/Lab	4
CE 370	Construction Methods and Equipment	3
CE 377	Construction Scheduling	3
		16
Fourth Year [2]	**First Semester**	
CE 331L	Fluid Mechanics/Lab	4
CE 477	Project Controls	3
	Technical Elective [3]	3
	Technical Elective [3]	3
	Core Second Language Elective	3
		16
	Second Semester	
CE 473	Construction Law [1]	3
CE 475	Construction Safety [1]	3

CE 499L	Design of CE Systems	3
	Core Social/Behavioral Science Elective [(1)]	3
	Core Fine Arts Elective	3
CE 495	Construction Internship	1
		16

October 23, 2014

Reason for Request for change to Civil Engineering undergraduate curriculum

In an effort to provide a more efficient delivery of course material, the following changes have been suggested by our Industry Advisory Board and Civil Engineering Faculty.

1. The faculty requested that the Chemistry 122 course be changed to Biology 110 in order to align the course with the Civil Engineering curriculum and thus ensure that the students have the same preparation as their colleagues in other engineering programs. This change had occurred in the Civil Engineering program several years ago; but was not reflected in the Construction Engineering program until now.
2. The CE 409 Engineering Ethics class was added to the curriculum to meet the needs of the ABET accreditation. Since the ABET accreditation criteria has changed to an outcomes based requirement, the stand alone CE 409 class no longer meets the ABET criteria. As the 1 hour class is only taught 2 days a week for half a semester, faculty hours and class room space is being obligated for a full semester on a topic that is no longer required as a stand-alone course. It is recommended that the class be dropped from the curriculum.
3. Currently Construction Engineering students have an option of taking either ME 301 Thermodynamics or ECE 203 Circuits. In this configuration, the students are not graduating with an understanding of both of these engineering fundamentals. However, the full semester course is more detail than a Construction Engineering student is required and exceeds the requirements for materials as established by the Fundamentals of Engineering exam. It is recommended that this requirement be dropped and that 1 hour module classes in both topics, Thermodynamics and Circuits, be offered in their replacement. The School of Engineering is concurrently developing the module courses and submitting the requisite Form Bs.
4. The current material offered by the ME 306 Dynamics course exceeds the requirements that are needed for the Construction Engineering students taking the Fundamentals of Engineering exam. It is recommended that a 1 hour module course be used to replace the requirement for a 3 credit hour course. The School of Engineering is concurrently developing the module course and submitting the requisite Form B.
5. The CE 455 Engineering Project Management and CE 477 Project Controls courses have been delivering very similar material. Feedback from the students and instructors has suggested that the two courses could be combined into an updated CE 477 Project Controls course.
6. Feedback from Industry Advisors and Construction Engineering Students has suggested that more electives would allow the students to specialize in more technical areas such as

BIM and Sustainable Construction. It is recommended that one additional elective be provided to the students to allow this specialization.

7. The current elective for Construction Engineering is for 4 hours. Since most of the electives offered in Construction Engineering are only 3 hours, it is recommended that the credit requirement be lowered to meet the 3 hours.

The combination of these changes will result in the following:

Existing program has 131 hours
Change Chem 122 to Biol 110 no change
Drop Chem 124L - 1 hour
Drop CE 409 Ethics - 1 hour
Drop ME 306 Dynamics - 3 hours
Drop ECE 203 or ME 301 - 3 hours
Drop CE 455 Engr Proj Management - 3 hours
Add 1 hour modules in Dynamics, Thermo, and Circuits + 3 hours
Add 1 Construction Elective + 3 hours
Adjust existing elective to 3 hours instead of 4 – 1 hour
Proposed program has 125 hours.

Justification, Planning, Budget and Workload for Construction Engineering curriculum changes
23 October 2014

Justification for the program – The requested changes will result in a reduction of credit hours from 131 to 125. The reduction in credit hours provides a more efficient path for students to obtain their Construction Engineering Degree without jeopardizing the quantity of material learned.

Impact on long range planning – There should be minimal impact on the courses being taught. As the ME and ECE courses are being taught in module form with less hours per class it is anticipated that the faculty teaching load will slightly decrease.

No additional budget is required to implement this change.

Faculty Workload – The CE 409 class is currently being taught by an adjunct professor and thus this requirement will be eliminated. Deletion of the CE 455 class will result in less of a need for adjunct faculty that has been required to teach the class. For the module classes, the reduction in students in the 3 credit hour class and replacement with a 1 credit hour class should result in a slightly lower workload.