CEAS-14-CCE-005

REQUEST TO COLLEGE CURRICULUM COMMITTEE FOR CURRICULAR IMPROVEMENTS

DEPARTMENT: CCE PROPOSED EFFECTIVE SEMESTER: Spring 2015 **COLLEGE:** Engineering & Applied Sciences

PROPOSED IMPROVEMENTS

Academic Program
- ☐ New degree*
- ☐ New major*
- ☐ New curriculum*
- ☐ New concentration*
- ☐ New certificate
- ☐ New minor
- ☒ Revised major
- ☐ Revised minor
- ☐ Admission requirements
- ☐ Graduation requirements
- ☐ Deletion ☐ Transfer
- ☐ Other (explain**)

Substantive Course Changes
- ☐ New course
- ☐ Pre or Co-requisites
- ☐ Deletion (required by others)
- ☐ Course #, different level
- ☐ Credit hours
- ☐ Enrollment restriction
- ☐ Course-level restriction
- ☐ Prefix ☐ Title and description (attach current & proposed)
- ☐ General education (select one) Not Applicable
- ☐ Other (explain**)

Misc. Course Changes
- ☐ Title
- ☐ Description (attach current & proposed)
- ☐ Deletion (not required by others)
- ☐ Course #, same level
- ☐ Variable credit
- ☐ Credit/no credit
- ☐ Cross-listing
- ☐ COGE reapproval
- ☐ Other (explain**)

**** Other:**
Title of degree, curriculum, major, minor, concentration, or certificate: Civil Engineering

Existing course prefix and #: **Proposed course prefix and #: Credit hours:**

Existing course title:

Proposed course title:

Existing course prerequisite & co-requisite(s):
Proposed course prerequisite(s) :
If there are multiple prerequisites, connect with "and" or "or". To remove prerequisites, enter "none."
Proposed course co-requisite(s):
If there are multiple corequisites, they are always joined by "and."
Proposed course prerequisite(s) that can also be taken concurrently:
Is there a minimum grade for the prerequisites or corequisites?
The default grades are D for undergraduates and C for graduates.
Major/minor or classification restrictions:
List the Banner 4 character codes and whether they should be included or excluded.
For 5000 level prerequisites & corequisites: Do these apply to: (circle one) undergraduates graduates both

Specifications for University Schedule of Classes:
a. Course title (maximum of 30 spaces): Design of Masonry Structures
b. Multi-topic course: ☐ No ☐ Yes
c. Repeatable for credit: ☐ No ☐ Yes
d. Mandatory credit/no credit: ☐ No ☐ Yes
e. Type of class and contact hours per week (check type and indicate hours as appropriate)
1. ☐ Lecture
2. ☐ Lab or discussion
3. ☐ Lecture/lab/discussion
4. ☐ Seminar or ☐ studio
5. ☐ Independent study
6. ☐ Supervision or practicum

CIP Code (Registrar's use only):

Chair/Director Date 5/7/2014

Chair, College Curriculum Committee Date

Dean Date: Graduate Dean: Date

Curriculum Manager: Return to dean ☐ Date Forward to: Date

Chair, COGE/ PEB / FS President Date

FOR PROPOSALS REQUIRING GSC/USC REVIEW:

* ☐ Approve ☐ Disapprove | Chair, GSC/USC Date

* ☐ Approve ☐ Disapprove | Provost Date

Revised May 2007. All previous forms are obsolete and should not be used.

1. Explain briefly and clearly the proposed improvement.

   Revising the civil engineering curriculum by replacing the four CCE Design Electives in the 7th and 8th semesters by:
   a) CCE Construction Engineering Elective
   b) CCE Structural Engineering Design Elective
   c) CCE Elective
   d) CCE Elective

2. Rationale. Give your reason(s) for the proposed improvement. (If your proposal includes prerequisites, justify those, too.)

   The rationale behind the above proposed three changes:

   One of ABET's accreditation requirements for civil engineering programs is to have a minimum of four sub-specialties, each consisting of two courses. Currently, the civil engineering program offers four sub-specialties from the department (construction, structures, geotechnical, and transportation) . Adding the two special electives (i.e. CCE Construction Engineering and CCE Structural Engineering Design Elective) will ensure that all students graduate with a deeper level of knowledge (three courses) in those two important areas of civil engineering. The remaining two electives will be general civil engineering electives after dropping the design from the requirement. This will give students more flexibility in choosing their electives.

3. Effect on other colleges, departments or programs. If consultation with others is required, attach evidence of consultation and support. If objections have been raised, document the resolution. Demonstrate that the program you propose is not a duplication of an existing one.

   No effect

4. Effect on your department's programs. Show how the proposed change fits with other departmental offerings.

   None, since we already offer courses in these areas that students choose from. We just want to make sure that they cover these areas in more depth.

5. Effects on enrolled students: Are program conflicts avoided? Will your proposal make it easier or harder for students to meet graduation requirements? Can students complete the program in a reasonable time? Show that you have considered scheduling needs and demands on students' time. If a required course will be offered during summer only, provide a rationale.

   No effect.

6. Student or external market demand. What is your anticipated student audience? What evidence of student or market demand or need exists? What is the estimated enrollment? What other factors make your proposal beneficial to students?

   The audience is civil engineering undergraduate students. Revising requirements of the civil engineering program strengthen the degree.

7. Effects on resources. Explain how your proposal would affect department and University resources, including faculty, equipment, space, technology, and library holdings. Tell how you will staff additions to the program. If more advising will be needed, how will you provide for it? How often will course(s) be offered? What will be the initial one-time costs and the ongoing base-funding costs for the proposed program? (Attach additional pages, as necessary.)

   No effect on resources beyond those already committed to the department as part of the civil engineering program.

8. General education criteria. For a general education course, indicate how this course will meet the criteria for the area or proficiency. (See the General Education Policy for descriptions of each area and proficiency and the criteria. Attach

additional pages as necessary. Attach a syllabus if (a) proposing a new course, (b) requesting certification for baccalaureate-level writing, or (c) requesting re-approval of an existing course.)

Not applicable

9. List the learning outcomes for the proposed course or the revised or proposed major, minor, or concentration. These are the outcomes that the department will use for future assessments of the course or program.

   Not applicable

10. Describe how this curriculum change is a response to assessment outcomes that are part of a departmental or college assessment plan or informal assessment activities.

    This is in response to an informal assessment of the civil engineering curriculum by the faculty.

11. (Undergraduate proposals only) Describe, in detail, how this curriculum change affects transfer articulation for Michigan community colleges. For course changes, include detail on necessary changes to transfer articulation from Michigan community college courses. For new majors or minors, describe transfer guidelines to be developed with Michigan community colleges. For revisions to majors or minors, describe necessary revisions to Michigan community college guidelines. Department chairs should seek assistance from college advising directors or from the admissions office in completing this section.

    Not applicable

Current Catalog Description:

First Semester (15 hours)

The following courses are Pre-engineering requirements.

- CCE 1001 - Introduction to Engineering Design **Credits:** 1 hour
- GEOS 1300 - Physical Geology **Credits:** 4 hours
- IME 1020 - Technical Communication **Credits:** 3 hours
  (Satisfies General Education Proficiency 1)
- IME 1420 - Engineering Graphics **Credits:** 3 hours
- MATH 1220 - Calculus I **Credits:** 4 hours
  or
  MATH 1700 - Calculus I, Science and Engineering **Credits:** 4 hours

Second Semester (16 hours)

The following courses are Pre-engineering requirements.

- CCE 1002 - Introduction to Engineering Analysis **Credits:** 1 hour
- CHEM 1100 - General Chemistry I **Credits:** 3 hours
  (Satisfies General Education Area VI)
- CHEM 1110 - General Chemistry Laboratory I **Credits:** 1 hour
  (Satisfies General Education Area VI)
- CS 1022 - Introduction to Engineering Computing II: Mathematical Software **Credits:** 1 hour
- CS 1023 - Introduction to Engineering Computing III: Computer Programming **Credits:** 1 hour
- MATH 1230 - Calculus II **Credits:** 4 hours
  or
  MATH 1710 - Calculus II, Science and Engineering **Credits:** 4 hours
- PHYS 2050 - University Physics I **Credits:** 4 hours
  (Satisfies General Education Area VI)
- PHYS 2060 - University Physics I Laboratory **Credits:** 1 hour
  (Satisfies General Education Area VI)

Third Semester (18 hours)

- CCE 2360 - Geomatics **Credits:** 3 hours
- IME 2610 - Engineering Statistics **Credits:** 3 hours
- MATH 2720 - Multivariate Calculus and Matrix Algebra **Credits:** 4 hours
  Pre-engineering requirement
- ME 2560 - Statics **Credits:** 3 hours
  Pre-engineering requirement
- PHYS 2070 - University Physics II **Credits:** 4 hours
  Pre-engineering requirement
- PHYS 2080 - University Physics II Laboratory **Credits:** 1 hour

Fourth Semester (16 hours)

- General Education Area I - Fine Arts **Credits:** 3 hours
- CHEG 2611 - Environmental Engineering I **Credits:** 3 hours
- MATH 3740 - Differential Equations and Linear Algebra **Credits:** 4 hours

- ME 2570 - Mechanics of Materials **Credits:** 3 hours
  Pre-engineering requirement
- ME 2580 - Dynamics **Credits:** 3 hours

Fifth Semester (15 hours)

- CCE 3360 - Soil Mechanics **Credits:** 3 hours
- ECON 2010 - Principles of Microeconomics **Credits:** 3 hours
  (Satisfies General Education Area V)
- IME 3100 - Engineering Economy **Credits:** 3 hours
- ME 3560 - Fluid Mechanics **Credits:** 3 hours
- PHIL 3160 - Ethics in Engineering and Technology **Credits:** 3 hours
  (Satisfies General Education Area II)

Sixth Semester (16 hours)

- General Education Area IV - Other Cultures **Credits:** 4 hours
- CCE 3080 - Civil and Construction Engineering Materials **Credits:** 3 hours
- CCE 3300 - Transportation Engineering **Credits:** 3 hours
- CCE 3330 - Construction Codes, Specifications, and Contracts **Credits:** 3 hours
- CCE 3860 - Structural Analysis **Credits:** 3 hours

Seventh Semester (16 hours)

- CCE Design Elective **Credits:** 3 hours
- CCE Design Elective **Credits:** 3 hours
- CCE 4300 - Traffic Design **Credits:** 3 hours
- CCE 4400 - Introduction to Structural Design **Credits:** 3 hours
- CCE 4561 - Foundation and Earth Retaining Structure Design **Credits:** 3 hours
- CCE 4830 - Project Design and Control **Credits:** 1 hour

Eighth Semester (14 hours)

- CCE Design Elective **Credits:** 3 hours
- CCE Design Elective **Credits:** 3 hours
- General Education Area III - U.S. Cultures and Issues **Credits:** 3 hours
- General Education Area VIII - Health & Well Being **Credits:** 2 hours
- CCE 4850 - Senior Project **Credits:** 3 hours
  (Satisfies General Education Proficiency 2)

New Catalog Description

First Semester (15 hours)

The following courses are Pre-engineering requirements.

- CCE 1001 - Introduction to Engineering Design **Credits:** 1 hour
- GEOS 1300 - Physical Geology **Credits:** 4 hours
- IME 1020 - Technical Communication **Credits:** 3 hours
  (Satisfies General Education Proficiency 1)
- IME 1420 - Engineering Graphics **Credits:** 3 hours
- MATH 1220 - Calculus I **Credits:** 4 hours
  or
  MATH 1700 - Calculus I, Science and Engineering **Credits:** 4 hours

Second Semester (16 hours)

The following courses are Pre-engineering requirements.

- CCE 1002 - Introduction to Engineering Analysis **Credits:** 1 hour
- CHEM 1100 - General Chemistry I **Credits:** 3 hours
  (Satisfies General Education Area VI)
- CHEM 1110 - General Chemistry Laboratory I **Credits:** 1 hour
- (Satisfies General Education Area VI)
- CS 1022 - Introduction to Engineering Computing II: Mathematical Software **Credits:** 1 hour
- CS 1023 - Introduction to Engineering Computing III: Computer Programming **Credits:** 1 hour
- MATH 1230 - Calculus II **Credits:** 4 hours
  or
  MATH 1710 - Calculus II, Science and Engineering **Credits:** 4 hours
- PHYS 2050 - University Physics I **Credits:** 4 hours
  (Satisfies General Education Area VI)
- PHYS 2060 - University Physics I Laboratory **Credits:** 1 hour
  (Satisfies General Education Area VI)

Third Semester (18 hours)

- CCE 2360 - Geomatics **Credits:** 3 hours
- IME 2610 - Engineering Statistics **Credits:** 3 hours
- MATH 2720 - Multivariate Calculus and Matrix Algebra **Credits:** 4 hours
  Pre-engineering requirement
- ME 2560 - Statics **Credits:** 3 hours
  Pre-engineering requirement
- PHYS 2070 - University Physics II **Credits:** 4 hours
  Pre-engineering requirement
- PHYS 2080 - University Physics II Laboratory **Credits:** 1 hour

Fourth Semester (16 hours)

- General Education Area I - Fine Arts **Credits:** 3 hours
- CHEG 2611 - Environmental Engineering I **Credits:** 3 hours

- MATH 3740 - Differential Equations and Linear Algebra **Credits:** 4 hours
- ME 2570 - Mechanics of Materials **Credits:** 3 hours
  Pre-engineering requirement
- ME 2580 - Dynamics **Credits:** 3 hours

Fifth Semester (15 hours)

- CCE 3360 - Soil Mechanics **Credits:** 3 hours
- ECON 2010 - Principles of Microeconomics **Credits:** 3 hours
  (Satisfies General Education Area V)
- IME 3100 - Engineering Economy **Credits:** 3 hours
- ME 3560 - Fluid Mechanics **Credits:** 3 hours
- PHIL 3160 - Ethics in Engineering and Technology **Credits:** 3 hours
  (Satisfies General Education Area II)

Sixth Semester (16 hours)

- General Education Area IV - Other Cultures **Credits:** 4 hours
- CCE 3080 - Civil and Construction Engineering Materials **Credits:** 3 hours
- CCE 3300 - Transportation Engineering **Credits:** 3 hours
- CCE 3330 - Construction Codes, Specifications, and Contracts **Credits:** 3 hours
- CCE 3860 - Structural Analysis **Credits:** 3 hours

Seventh Semester (16 hours)

- CCE Construction Engineering Elective **Credits:** 3 hours
- CCE Elective **Credits:** 3 hours
- CCE 4300 - Traffic Design **Credits:** 3 hours
- CCE 4400 - Introduction to Structural Design **Credits:** 3 hours
- CCE 4561 - Foundation and Earth Retaining Structure Design **Credits:** 3 hours
- CCE 4830 - Project Design and Control **Credits:** 1 hour

Eighth Semester (14 hours)

- CCE Structural Engineering Design Elective **Credits:** 3 hours
- CCE Elective **Credits:** 3 hours
- General Education Area III - U.S. Cultures and Issues **Credits:** 3 hours
- General Education Area VIII - Health & Well Being **Credits:** 2 hours
- CCE 4850 - Senior Project **Credits:** 3 hours
  (Satisfies General Education Proficiency 2)