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| For Academic Affairs and Research Use Only | |
| CIP Code: |  |
| Degree Code: |  |

**New Course Proposal Form**

**[Y] Undergraduate Curriculum Council**

**[] Graduate Council**

|  |
| --- |
| **[Y] New Course or [ ]Experimental Course (1-time offering) (Check one box)** |

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

Email completed proposals to [curriculum@astate.edu](mailto:curriculum@astate.edu) for inclusion in curriculum committee agenda.

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| --- | --- |
| Jason Stewart 12/4/2017 **Department Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **COPE Chair (if applicable)** |
| Jason Stewart 12/4/2017 **Department Chair:** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Head of Unit (If applicable)** |
| Jason Stewart 12/4/2017 **College Curriculum Committee Chair** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Undergraduate Curriculum Council Chair** |
| Brandon Kemp 12/4/2017 **College Dean** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Graduate Curriculum Committee Chair** |
| |  |  | | --- | --- | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |   **General Education Committee Chair (If applicable)** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…  **Vice Chancellor for Academic Affairs** |

1. Contact Person (Name, Email Address, Phone Number)

Tarek Ragab, [tragab@astate.edu](mailto:tragab@astate.edu), ext3370

2. Proposed Starting Term and Bulletin Year

Fall 2018

3. Proposed Course Prefix and Number (Confirm that number chosen has not been used before. For variable credit courses, indicate variable range. *Proposed number for experimental course is 9*. )

CE4823/CE5823

4. Course Title – if title is more than 30 characters (including spaces), provide short title to be used on transcripts. Title cannot have any symbols (e.g. slash, colon, semi-colon, apostrophe, dash, and parenthesis). Please indicate if this course will have variable titles (e.g. independent study, thesis, special topics).

Earthquake Engineering

5. Brief course description (40 words or fewer) as it should appear in the bulletin.

Causes of earthquakes; characteristics of earthquake ground motions; magnitude and intensity measurements; free and forced vibration; numerical methods; elastic response spectra; soil liquefaction; general seismic code requirements. Prerequsite, C or better in CE 3233, CE 4251 and CE 4253. Dual listed as CE 5823. Fall.

6. Prerequisites and major restrictions. (Indicate all prerequisites. If this course is restricted to a specific major, which major. If a student does not have the prerequisites or does not have the appropriate major, the student will not be allowed to register).

1. **Yes / No** Are there any prerequisites? Yes
   1. If yes, which ones?

CE 3233 Structural Analysis II, with grade C or better

CE4251 Soil Mechanics lab, with grade C or better

CE4253 Soil mechanics, with grade C or better

* 1. Why or why not?

This course builds on the student knowledge about matrix structural analysis which is taught in CE3233 as well as on the student knowledge of different soil properties which is taught in CE4251 and CE4253

1. **Yes / No** Is this course restricted to a specific major? No
   1. If yes, which major? Enter text...

7. Course frequency(e.g. Fall, Spring, Summer). *Not applicable to Graduate courses.*

Spring, even

8. Will this course be lecture only, lab only, lecture and lab, activity, dissertation, experiential learning, independent study, internship, performance, practicum, recitation, seminar, special problems, special topics, studio, student exchange, occupational learning credit, or course for fee purpose only (e.g. an exam)? Please choose one.

Lecture only

9. What is the grade type (i.e. standard letter, credit/no credit, pass/fail, no grade, developmental, or other [please elaborate])

Standard letter

10. **Yes / No** Is this course dual listed (undergraduate/graduate)? Yes

11. **Yes / No** Is this course cross listed? No

*(If it is, all course entries must be identical including course descriptions. Submit appropriate documentation for requested changes. It is important to check the course description of an existing course when adding a new cross listed course.)*

**11.1** – If yes, please list the prefix and course number of cross listed course.

Enter text...

**11.2** – **Yes / No** Are these courses offered for equivalent credit?

Please explain. Enter text...

12. **Yes / No** Is this course in support of a new program? NO

a. If yes, what program?

Enter text...

13. **Yes / No** Does this course replace a course being deleted? No

a. If yes, what course?

Enter text...

14. **Yes / No** Will this course be equivalent to a deleted course? No

a. If yes, which course?

Enter text...

15. **Yes / No** Has it been confirmed that this course number is available for use? Yes

*If no: Contact Registrar’s Office for assistance.*

16. **Yes / No** Does this course affect another program? No

If yes, provide confirmation of acceptance/approval of changes from the Dean, Department Head, and/or Program Director whose area this affects.

Enter text...

**Course Details**

17. Outline (The course outline should be topical by weeks and should be sufficient in detail to allow for judgment of the content of the course.)

Week 1: Causes of earthquakes

Week 2: Characteristics of earthquake ground motion

Week 3: Earthquake magnitude and intensity measurements

Week 4: Introduction to soil liquefaction

Week 5: Soil liquefaction

Week 6: Soil liquefaction Impact & Mitigation

Week 7: General Code Seismic Requirements

Week 8: Equation of motion of single degree of freedom structures

Week 9: Damped and undamped free vibration

Week 10: Forced vibration of single degree of freedom structures

Week 11: Numerical methods for solving the equation of motion for arbitrary loads

Week 12: Modal analysis of multi-degree of freedom structures

Week 13: Elastic response spectra

Week 14: Design codes for calculating seismic loads

18. Special features (e.g. labs, exhibits, site visitations, etc.)

None

19. Department staffing and classroom/lab resources

This course needs 1 faculty with a geotechnical engineering background and one faculty member with structural engineering background to be offered. The course will be taught in a regular classroom steup

1. Will this require additional faculty, supplies, etc.?

No

20. **Yes / No** Does this course require course fees? No

*If yes: please attach the New Program Tuition and Fees form, which is available from the UCC website.*

**Course Justification**

21. Justification for course being included in program. Must include:

a. Academic rationale and goals for the course (skills or level of knowledge students can be expected to attain)

The course will provide students with in-depth understanding of various causes of earthquake, earthquake characteristics and their measurements. Students will also learn different aspects of soil liquefaction. Moreover, students will learn the basic aspects of the dynamic analysis of structures analytically and numerically and the modal analysis of multi-degree of freedom structures.

b. How does the course fit with the mission established by the department for the curriculum? If course is mandated by an accrediting or certifying agency, include the directive.

The course is consistent with the mission of the Bachelor of Science in Civil Engineering program within the College of Agriculture, Engineering and Technology. Program outcome 4 states that graduates have “The ability to identify, formulate, and solve engineering problems”. The curriculum is designed to teach student identify earthquake causes, intensity and characteristics. Moreover, the course teaches the students to formulate the equation of motion of a structure under seismic loading and solve it for various conditions to identify the structural behavior.

c. Student population served.

Around 20 undergraduate civil engineering students and 5 graduate engineering students

d. Rationale for the level of the course (lower, upper, or graduate).

This course will be dual listed as an upper level undergrad/grad course. This course builds on engineering knowledge attained by the students during their junior year with topics that are advanced enough for listing it as graduate course as well. In most universities many of the topics covered in this course are covered in a dynamics of structures course and listed as a graduate course.

**Assessment**

**University Outcomes**

22. Please indicate the university-level student learning outcomes for which this new course will contribute. Check all that apply.

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| * 1. **[ ]** Global Awareness | * 1. **[Y]** Thinking Critically | * 1. **[ ]** Information Literacy |

**Relationship with Current Program-Level Assessment Process**

23. What is/are the intended program-level learning outcome/s for students enrolled in this course? Where will this course fit into an already existing program assessment process?

This course will contribute to the following program outcomes, although not used to assess them since it will serve as an elective course not required for all CE students:

Outcome 1: Apply knowledge of mathematics, science, and engineering

Outcome 4: An ability to identify, formulate, and solve engineering problems

Outcome 10: An ability to use the techniques, skills and modern engineering tools necessary for engineering practice

24. Considering the indicated program-level learning outcome/s (from question #23), please fill out the following table to show how and where this course fits into the program’s continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

**Table VI-3. Relation of Student Outcomes to Curriculum**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Civil**  **Engineering Program Engineering Courses** | **Student Outcome Number** | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Engineering Core** | All students must complete the 20 hours of engineering core courses. | | | | | | | | | | |
| **ENGR 1402**, Concepts of Engineering |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 1412**, Software Applications for Engineers |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 2401**, Applied Engineering Satistics |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 2403**, Statics |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 3433**, Engineering Economics |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 4401**, Senior Seminar |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 4453**, Numerical Methods for Engineers |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 4463**, Senior  Design I | A |  | A |  | A | A |  | A |  |  |  |
| **ENGR 4482**, Senior  Design II |  |  | A |  |  | A |  | A |  | A |  |
| **Civil Engineering Required Courses** | All students must complete 60 hours of civil engineering courses. | | | | | | | | | | |
| **CE 2202**, Civil Engineering Presentations |  |  |  |  |  |  |  |  |  |  |  |
| **CE 2223**, Plane Surveying |  |  |  |  |  |  |  |  |  |  |  |
| **CE 3213**, Structural Analysis I |  |  |  |  |  |  |  |  |  |  |  |
| **CE 3224**, Civil Engineering Materials |  | A |  |  |  |  |  |  |  |  |  |
| **CE 3253**, Engineering Hydrology |  |  |  |  |  |  |  |  |  | A |  |
| **CE 3263**, Introduction to Environmental Engineering |  |  |  |  |  |  |  |  | A |  |  |
| **CE 3273**, Water and Waste Systems |  |  |  |  |  |  |  |  |  |  | A |
| **CE 4203**, Transportation Engineering I |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4223**, Transportation Engineering II |  |  |  | A |  |  | A |  |  | A | A |
| **CE 4233**, Foundation  Engineering |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4243**, Reinforced Concrete Design |  |  |  |  |  |  |  |  |  |  | A |
| **CE 4251**, Soil Mechanics Laboratory |  |  |  |  |  |  |  |  |  |  |  |

**Table VI-3. Relation of Student Outcomes to Curriculum (continued)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Civil**  **Engineering Program Engineering Courses** | **Student Outcome Number** | | | | | | | | | | |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Civil Engineering**  **Required Courses** |  | | | | | | | | | | |
| **CE 4253**, Soil Mechanics |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4283**, Structural Steel Design |  |  |  |  |  |  |  |  |  |  | A |
| **ENGR 2411**, Mechanics of Materials Laboratory |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 2413**, Mechanics of Materials |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 3423**, Dynamics |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 3471**, Fluid Mechanics Laboratory |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 3473**, Fluid Mechanics |  |  |  |  |  |  |  |  |  |  |  |
| **Civil Engineering Elective Courses** | All students must complete either CE 3233 or CE 4263 AND either ENGR 2423 or ENGR 3443  AND one additional course from the CE (not ENGR) courses listed. | | | | | | | | | | |
| **CE 3233**, Structural Analysis II |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4263**, Water and Waste Treatment |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4293**,Sustainability and Water Res*.* |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4803**, Open-Channel Flow |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4813**, Groundwater Hydrology |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4823**,Earthquake Engineering |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 2423**, Electric Circuits I |  |  |  |  |  |  |  |  |  |  |  |
| **ENGR 3443**, Engineering Thermodynamics I |  |  |  |  |  |  |  |  |  |  |  |

**Course-Level Outcomes**

25. What are the course-level outcomes for students enrolled in this course and the associated assessment measures?

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| --- | --- |
| **Outcome 1** | Identify causes and characteristics of earthquakes and earthquake ground motion and soil liquefaction characterstics |
| Which learning activities are responsible for this outcome? | Class lectures, Homework assignments and exams |
| Assessment Measure | 80% of students will receive a 70% score or higher on related questions on midterm and final exams |

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| **Outcome 2** | Analyze structures under dynamic seismic loads analytically and numerically |
| Which learning activities are responsible for this outcome? | Class lectures, Homework assignments and exams |
| Assessment Measure | 80% of students will receive a 70% score or higher on related questions on midterm and final exams |

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| **Instructions** |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Follow the following guidelines for indicating necessary changes.**  **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  - Deleted courses/credit hours should be marked with a red strike-through (~~red strikethrough~~)  - New credit hours and text changes should be listed in blue using enlarged font (blue using enlarged font).  - Any new courses should be listed in blue bold italics using enlarged font (***blue bold italics using enlarged font***)  *You can easily apply any of these changes by selecting the example text in the instructions above, double-clicking the ‘format painter’ icon 🡪 , and selecting the text you would like to apply the change to.*  *Please visit* [*https://youtu.be/yjdL2n4lZm4*](https://youtu.be/yjdL2n4lZm4) *for more detailed instructions.* |

**Bulletin Changes**

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**CE 429V. Special Problems in Civil Engineering** Individually directed problems in civil engi­neering for juniors and seniors. A course outline and project summary listing the goals and expected outcomes must be approved by the student advisor and the program director. Prerequisites are dependent on the nature of the special problem. Demand.

**CE 4823. Earthquake Engineering.** Causes of earthquakes; characteristics of earthquake ground motions; magnitude and intensity measurements; free and forced vibration; numerical methods; elastic response spectra; soil liquefaction; general seismic code requirements. Prerequsite, C or better in CE 3233, CE 4251 and CE 4253. Dual listed as CE 5823. Fall.