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

**New Course Proposal Form**

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

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| --- |
| **[X] 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 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** |
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| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Enter date |

**General Education Committee Chair (If applicable)**   | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Enter date…**Vice Chancellor for Academic Affairs** |

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

*Yeonsang Hwang, Ph.D.,* *yhwang@astate.edu**, 870-972-3581*

2. Proposed Starting Term and Bulletin Year

*Fall 2019*

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*. )

*CE 4813*

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).

*Groundwater Hydrology*

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

*Physical principles governing groundwater flow and dynamics and the impact of human activity on groundwater sources.*

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 Are there any prerequisites?
	1. If yes, which ones?

*C or better in CE 3253 Engineering Hydrology*

* 1. Why or why not?

 *Students must have solid understanding of fundamental fluid mechanics and civil engineering water system.*

1. NO Is this course restricted to a specific major?
	1. If yes, which major? Enter text...

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

Fall, odd

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. NO Is this course dual listed (undergraduate/graduate)?

11. NO Is this course cross listed?

*(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** – NO Are these courses offered for equivalent credit?

Please explain. Enter text...

12. NO Is this course in support of a new program?

a. If yes, what program?

 Enter text...

13. NO Does this course replace a course being deleted?

a. If yes, what course?

Enter text...

14. NO Will this course be equivalent to a deleted course?

a. If yes, which course?

Enter text...

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

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

16. NO Does this course affect another program?

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** | **Topic** |
| --- | --- |
| 1 | Introduction to Groundwater / Hydrologic Cycle and Storage |
| 2 | Flow Dynamics : Darcy’s Law |
| 3 | Flow Dynamics : Multi-dimensional Generalization, Hydraulic Conductivity |
| 4 | Flow Dynamics |
| 5-6 | Flow Nets |
| 7 | Well Hydraulics : Steady and Unsteady Flow |
| 8 | Pumping Test / Superposition |
| 9 | Visualization of Flow Field |
| 10 | Unsaturated Flow |
| 11-12 | Infiltration and Recharge |
| 13-14 | Contaminant Transport |

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

NO

19. Department staffing and classroom/lab resources

NO

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

 NO

20. NO Does this course require course fees?

 *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)

 *Groundwater flow and contaminant transportation is an important component for water track focused civil engineering graduates.*

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.

 *This course will equip our graduates with essential skills for groundwater analysis and introductory knowledge in computational approaches.*

c. Student population served.

*CE Majors. Open to MSE and EVS grad students.*

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

*Students pursuing the study of groundwater hydrology must be equipped with the good understanding of all engineering calculus sequence (preferably, exposure to differential equations), fluid mechanics, and hydrologic systems.*

**Assessment**

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

22. 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?

*Students will gain key knowledge of groundwater flow through multi-dimensional equations, simplifications, graphical representations, and software-aided calculations to understand the occurrence and use of groundwater.*

*Outcome 1: A good understanding of mathematics, science, and engineering, and an ability to apply this knowledge in engineering practice*

*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 entry-level practice in civil engineering*

*Outcome 11: An ability to analyze and design a system, component, or process to meet desired needs in civil engineering within realistic constraints such as economic, environmental, social, political, ethical, health and safely, manufacturability, and sustainability.*

23. 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.

**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**, SeniorDesign 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**, FoundationEngineering |  |  |  |  |  |  |  |  |  |  |  |
| **CE 4243**, Reinforced Concrete Design |  |  |  |  |  |  |  |  |  |  | A |
| **CE 4251**, Soil Mechanics Laboratory |  |  |  |  |  |  |  |  |  |  |  |
| **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 3443AND 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 |  |  |  |  |  |  |  |  |  |  |  |

*Note; The addressed outcomes will* ***NOT*** *be assessed by the proposed new course.*

 **Course-Level Outcomes**

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

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| --- | --- |
| **Outcome 1** | *Students will be able to visualize groundwater surface elevation change due to pumping.* |
| Which learning activities are responsible for this outcome? | *Students will learn and produce groundwater profile due to well pumping by applying equations and mathematical software.* |
| Assessment Measure  | *Students will submit calculations and plots of water profile change in an assignment given with pumping and soil parameters.* |

*(Repeat if needed for additional outcomes)*

**Bulletin Changes**

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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.* |

**CE 4813 Groundwater Hydrology to be introduced on page 426 after CE 429V. Special Problems in Civil Engineering**

**CE 4813.** **Groundwater Hydrology P**hysical principles governing groundwater flow and dynamics and the impact of human activity on the groundwater sources. Prerequisite, C or better in CE 3253. Fall, odd.



CE 4813

Insert Here