REQUEST FOR COMMENTS ON PROPOSAL
FOR A NEW COURSE OFFERING

Distribution Date: Course: CE 420 Environmental Measurements

TO: AEM: John Baker  ECE: Tim Haskew
    CE: Ken Fridley
    CHE: John Van Zee  ME: Clark Midkiff
    CS: David Cordes  MTE: Viola Acoff
    DO: Dean Karr
        Assoc. Dean John Wiest
        Assoc. Dean Kevin Whitaker

FROM:

SUBJECT: New Course Proposal

The faculty of the Department of has reviewed and endorsed the attached new course proposal and is submitting it to your department for review and comments.

If you deem it appropriate, please discuss the attached course proposal with any or all of your faculty. We would appreciate any comments concerning any aspect of the proposal. In the absence of any feedback within four weeks of the distribution date that would require further consideration by our faculty, I will ask the Dean to place the proposal on the agenda of the Dean's Advisory Council meeting for college approval.

Thank you.

COMMENTS:
COLLEGE OF ENGINEERING
PROPOSAL TO OFFER A NEW COURSE

DATE: November 11, 2013
DEPARTMENT: Civil, Construction and Environmental Engineering

COURSE NO: 420
TITLE: Environmental Measurements

EFFECTIVE DATE: January 1, 2014

PART ONE
(To be completed by the individual proposing the course)

I. GENERAL INFORMATION

A. Description (50 words or less)

Environmental Engineering phenomena are explored through conducting laboratory experiments, selecting analytical protocols to achieve an objective, evaluating collected data sets, and discussing the results in well written reports. The course is composed of classroom lectures/discussions and weekly laboratory activities.

B. 1. Prerequisite(s)  CE320, CE 378, and GES 255
    2. Corequisite(s)  CE 424
    3. Other

C. Course Level: undergraduate (senior)
   (undergraduate, adv. undergraduate, graduate etc.)

D. Format: 2 Hours of lecture per week
            Hours of discussion (recitation) per week
            3 Hours of laboratory (or field work) per week

   Other instructional methods and modes: 1 contact hour during weekly lecture periods is allocated to laboratory lecture bring the lab total to three contact hours per week. 1 during in-class “lecture” period and 2 in the lab

E. Credit Hours: 3
II. ACADEMIC INFORMATION

A. Course objectives:

1. Conduct experiments to illustrate environmental engineering fundamentals in water, air and soil.
2. Evaluate data sets from environmental phenomena/laboratory experiments to assess performance of environmental treatment processes or fate in natural systems.
3. Design, conduct, and evaluate the results of a laboratory-based investigation of a particular environmental issue, concern, or phenomena.
4. Present findings of engineering and laboratory investigations in formal oral and written reports.

B. What course or courses, if any, will this course replace? None

Implementation of this course, if it does not replace an existing course, may cause enrollment reductions in other courses. Please list all courses in which such enrollment declines can be expected.

Given the new degree in environmental engineering, this course was developed specifically to meet the student’s professional needs and ABET needs for environmental engineering programs. It is not expected to displace students from any particular course or cause enrollment reductions.

C. What is the justification for proposing the course at this time?
Support new B.S. degree in Environmental Engineering. Enhance BS in Civil Engineering and minor in Environmental Engineering

D. Name the current faculty who are qualified to teach this course
The course as a whole: Mark Elliott, Derek Williamson, Pauline Johnson, Robert Pitt, and Andrew Ernest. Individual modules in hydrology: Glenn Tootle, Rocky Durrans, and Robert Pitt.

What specific qualifications and capabilities must an individual have in order to teach this course? Education background in environmental processes and treatment and current teaching and professional interests in various sub-disciplines of environmental engineering.

E. This course is designed for the following curricula:
B.S. Environmental Engineering, Minor in Environmental Engineering, and B.S. in Civil Engineering (senior elective)

F. This course will be required for the following majors and minors:
B.S. Environmental Engineering

G. Attach an outline of the course of at least one page in length and name any textbooks or principal readings which will be used. This outline must be in ABET format. (This request is not intended to bind future instructors to a detailed program -- but only to establish the general scope, nature, and level of the course.)
PART TWO
(To be completed by the department head alone or in consultation with the proposer.)

III. BUDGETARY INFORMATION

A. Anticipated frequency of offering: ______ sections each semester
   ______ sections each Fall Term
   ______ sections each Spring Term
   ______ sections during Summer School
   ______ according to demand
   Other: ____________________________________________

B. Estimated student interest per offering:

   Estimated total enrollment:
   First Year: 10
   Second Year: 15
   Third Year: 24

C. Estimated capacity per section:
   Lecture 48
   Discussion
   Laboratory 24

D. If this course is approved:

   1. Will additional faculty or staff members be needed? IF YES, DESCRIBE STAFF NEEDS.
      No

   2. Will additional space, equipment, special library materials, computer time, or any major expenses be involved? IF YES, DESCRIBE THESE EXPENSES.
      Current laboratory space (NERC 1015) and equipment has been allocated for this lab course.

   3. Please describe any unusual expense items such as team teaching, guest lecturers, travel, etc.
      none

E. Has this proposal been discussed with other related disciplinary areas within the division? No
   Outside the division? No

F. Is there any indication that this course duplicates course work offered elsewhere in The University? No
II. EVALUATION

A. Describe the system of evaluation that will be used to determine whether this course should be continued in the departmental program. It would be helpful to relate this system of evaluation to the kinds of information requested in Part One, Section II, and Part Two, Section I.

(1) Enrollment Data  
(2) Comments by ABET visitors  
(3) Part of routine department curriculum assessment performed by: by curriculum committee, department head, and departments advisory board

Proposed by: Derek G. Williamson  
Date: November 11, 2013

Proposed by: Mark Elliott  
Date: November 11, 2013

Approved by  
Department Head:  
Date:  

Approved by  
Dean:  
Date:  

Conditions of approval, if any:

Upon approval by the dean, a copy to be forwarded with the course inventory form to the Office of Academic Affairs.
CE 420 Environmental Measurements

Credit and contact hours: 3 semester hours, 42 contact hours

Course coordinator and instructor’s names: Derek Williamson, Mark Elliott, and Pauline Johnson


Catalog description: Environmental Engineering phenomena are explored through conducting laboratory experiments, selecting analytical protocols to achieve an objective, evaluating collected data sets, and discussing the results in well written reports. The course is composed of classroom lectures/discussions and weekly laboratory activities.

Prerequisites and co-requisites: Prerequisite: CE 320, CE 378, and GES 255. Co-req. CE 424

Status in the programs: Required for BSEnvE; Selected Elective for BSCE.

Course objectives:
1. Conduct experiments to illustrate environmental engineering fundamentals in water, air and soil.
2. Evaluate data sets from environmental phenomena/laboratory experiments to assess performance of environmental treatment processes or fate in natural systems.
3. Design, conduct, and evaluate the results of a laboratory-based investigation of a particular environmental issue, concern, or phenomena.
4. Present findings of engineering and laboratory investigations in formal oral and written reports.

Course (Lab) Topics:
1. Safety, PPE, and Exposure
2. Aerosols: Measurement Exposure
3. Reactor Analysis and Tracers
4. Physical Chemical Processes in Drinking Water
5. Environmental Microbiology
6. Soil Contamination and Leaching
7. Independent Investigations

Relation of course to Student Learning Outcomes:

<table>
<thead>
<tr>
<th>Outcome (level at graduation)</th>
<th>Outcome Description (level achieved in this course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T2 (Level 4)</td>
<td>Select and conduct engineering experiments, and analyze and evaluate the resulting data. (Level 4)</td>
</tr>
<tr>
<td>T7 (Level 2)</td>
<td>Explain key aspects of at least one traditional or emerging program-relevant area of advanced specialization. (Level 2)</td>
</tr>
<tr>
<td>P2 (Level 4)</td>
<td>Organize and deliver effective written, verbal, and graphical communications. (Level 4)</td>
</tr>
</tbody>
</table>
CE 420 Environmental Measurements

Instructor: Dr. Mark Elliott
Office: 1112 Bevill
Office Hours: TBA
Phone: 348-5469
e-mail: melliott@eng.ua.edu

Catalog Description
Environmental Engineering phenomena are explored through conducting laboratory experiments, selecting analytical protocols to achieve an objective, evaluating collected data sets, and discussing the results in well written reports. The course is composed of classroom lectures/discussions and weekly laboratory activities.

Course Objectives
At the successful completion of this course, the student will be able to:

1. Conduct experiments to illustrate environmental engineering fundamentals in water, air and soil.
2. Evaluate data sets from environmental phenomena/laboratory experiments to assess performance of environmental treatment processes or fate in natural systems.
3. Design, conduct, and evaluate the results of a laboratory-based investigation of a particular environmental issue, concern, or phenomena.
4. Present findings of engineering and laboratory investigations in formal oral and written reports.

Prerequisites
CE320, CE378 and GES 255, and CE424 (prerequisite with concurrent enrollment)

Required Text

Additional Required Readings
Journal articles and other selected readings will be distributed through the UA learn system and or the reserve section of the Science and Engineering Library as appropriate.
Grading

Laboratory Report 1 ..................................................8%
Laboratory Report 2-6 ..........12% each ....60%
Final Report .................................................................22%
Oral Presentation of Final Report ............10%
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100%

Grading Policy
Grades will be assigned on the following basis: A for exceptionally outstanding work, B for above average performance, C for average performance, D for poor performance, and F for failure to achieve learning objectives of course.

Attendance Policy
Attendance is expected in all lectures and is mandatory for all labs. Extenuating medical or similar documented emergencies resulting in absence from lab will be accommodated.

Homework/lab Policy
Assignments submitted for grading must conform to the prescribed formats.

Exam/Quiz Policy
No Exams. Quizzes may be used to check laboratory preparation and, if so, will become part of the lab report grading rubric (worth no more than 10% of lab report).

Policy on Missed or Late Coursework
Lab reports must be turned in on time. Late reports will be penalized 10% per day. Extenuating medical or similar documented emergencies resulting in late reports will be accommodated.

Other Course Policies
Assignments and course content are subject to change when circumstances dictate, and as the course progresses. If modifications are made, you will be given due notice.

Academic Misconduct
Any act of dishonesty in any work constitutes academic misconduct. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct and will be handled by the Dean’s office.

Accommodations
Reasonable accommodations are made on an individualized basis. It is the responsibility of persons with disabilities, however, to seek available assistance and make their needs known. The University has designated the Office of Disability Services as the campus coordinating office for the provision and delivery of services and reasonable accommodations that ensure the University's programs, services, and activities are accessible to students with disabilities. The Office of Disability Services is available to assist any student who has a qualified and documented disability. Please contact the Office of Disability Services at 348-4285 for additional information.
**Course Portfolio**

The Department requires every student in every class to develop a course outcome portfolio. Through the course portfolio, each student is to demonstrate their achievement of the specific program outcomes addressed in each course (see the “Contribution to Program Student Outcomes” section of this syllabus). Graded work from the course (e.g., graded homework, projects, reports, quizzes, exams, etc.) may be used to illustrate achievement of the outcomes. Several assignments, projects, and/or quiz/exam questions in each course will address specific outcomes. If a student does well in these assignments, they would be suitable examples for inclusion in the degree portfolio. The portfolios will be collected prior to or during the final exam.

The intent of this requirement is to assist students with the development of a well-organized program outcome achievement portfolio required for graduation.

The hardcopy portfolio must be organized with tabs indicating each outcome separately (e.g., T2, T7, and P2). Behind each tab, student work demonstrating command of the respective outcome should be neatly presented. All materials must be three-hole punched, but do not use a three-ring binder. Rather, the portfolio materials must be secured with appropriately sized binder clips. A cover page is required and must include the student’s name, the course number and title, and the term the course was taken. Electronic versions may also be submitted.

**Portfolio Grading**

The portfolios will not be graded.

**Topic Outline**

1. Safety, PPE, and Exposure
2. Aerosols: Measurement Exposure
3. Reactor Analysis and Tracers
4. Physical Chemical Processes in Drinking Water
5. Environmental Microbiology
6. Soil Contamination and Leaching
7. Independent Investigations
8. Formal Oral Presentation of Independent Investigations

**Exams and Assignments**

Assignments and exam dates will be announced in class.
Contribution to Program Student Outcomes

As required for the accreditation of our programs, the following student learning outcomes have been established. These outcomes describe what students are expected to know or be able to do at the time of graduation. At a minimum, the outcomes that have been checked below will be fully or partially addressed, perhaps at a lower level, in a significant and direct manner in this course.

Outcome F1: Solve problems in mathematics through differential equations, probability and statistics, calculus-based physics, general chemistry, and one additional area of science.

Outcome F2: Explain the importance of (1) humanities, literature, and fine arts, and (2) history and social behavior in the professional practice of civil or construction engineering.

Outcome T1: Analyze and solve problems in material science, mechanics of solids, and mechanics of fluids.

Outcome T2: Select and conduct program-relevant civil or construction engineering experiments to meet a need, and analyze and evaluate the resulting data.

Outcome T3: Apply relevant knowledge, techniques, skills, and modern engineering tools to identify, formulate, and solve engineering problems, including
   - BSCE – problems in at least four technical areas appropriate to civil engineering or
   - BSConE – problems in construction processes, communications, methods, materials, systems, equipment, planning, scheduling, safety, economics, accounting, cost analysis and control, decision analysis, and optimization.

Outcome T4: Explain the impact of historical and contemporary issues on civil or construction engineering, and predict possible impacts of a specific, relatively constrained engineering solution on the economy, environment, and society.

Outcome T5: Develop solutions to well-defined project management problems within civil or construction engineering.

Outcome T6: Design a system or process in more than one program-relevant civil or construction engineering specialty field to meet desired needs, including sustainability and within other realistic constraints such as economic, environmental, social, political, ethical, health and safety, and constructability.

Outcome T7: Explain key aspects of at least one traditional or emerging program-relevant area of advanced specialization.

Outcome P1: Analyze a situation involving multiple conflicting professional, legal, and ethical interests, to determine an appropriate course of action.

Outcome P2: Organize and deliver effective written, verbal, graphical and virtual communications.

Outcome P3: Demonstrate the ability to learn through independent study, without the aid of formal instruction.

Outcome P4: Demonstrate attributes supportive of the professional practice of engineering; apply leadership principles to direct the efforts of a small group to solve a relatively constrained problem; and function effectively as a member of a multidisciplinary team to solve open-ended engineering problems.

Outcome P5: Explain the importance of licensure, and basic concepts in engineering management, business, law, public administration, public policy, and globalization as related to the professional practice of civil or construction engineering.