

Academic Affairs Committee

Course Proposal Form

- This course proposal form should be completed when introducing a new course or revising an existing course.
- Download and complete the form on your computer, do not fill out in a web browser.
- All proposals must first go through your departmental curriculum committee process before being submitted to the Academic Affairs Committee (AAC). Be sure to plan for departmental and AAC schedules and deadlines.
- The proposal will be reviewed by the AAC or, in the case of a minor revision, approved administratively by the Associate Provost for Instruction.
- If you are proposing a new course, or renumbering an existing course, please check with the Registrar regarding use/reuse of the number.
- If you are proposing a SUNY general education course, please contact curriculum@esf.edu for more information and guidance. General education courses require additional paperwork.

Proposer name: Yaqi You

Contact email: yyou@esf.edu

Contact phone: (315) 470-6765

Department: Environmental Resources Engineering

1. Course Information

- 1.1. Type of Proposal: New Revision Replacement
- 1.2. Course Prefix, Number & Title: ERE 480 Fate and Transport of Contaminants
- 1.3. If this course is replacing a current ESF course, please provide the number and name of the course to be deactivated and removed, if this proposal is approved:

NA

- 1.4. If this is a course revision, please indicate the reason for revision (check all that apply):

- | | | | |
|--|---|---|---|
| <input type="checkbox"/> Course Number,
Division, or Prefix | <input type="checkbox"/> Title | <input type="checkbox"/> Credit
Hours | <input type="checkbox"/> Pre or
Co-Requisites |
| <input type="checkbox"/> Catalog
Description | <input type="checkbox"/> Instructional
Methods | <input type="checkbox"/> General
Education | <input type="checkbox"/> Format |
| <input type="checkbox"/> Learning
Outcomes | <input type="checkbox"/> Concepts or
Content | <input type="checkbox"/> Institutional
Resources | <input checked="" type="checkbox"/> Semester
Offered |

2. Detailed Course Description

- 2.1. Describe why this course (or revision) is needed to meet current or proposed goals and outcomes of the program or College. For revisions, provide explanation and/or justification for change.

A major revision was proposed and approved in April 12, 2021 by the Committee on Curriculum. Currently, ERE 480 reinforces fundamental physical, chemical, and biological principles in order to better prepare students for senior design courses such as ERE 440 Water and Wastewater Treatment. To that end, we now propose to switch the semesters offering ERE 480 (from fall to spring semester) and ERE 440 (from spring to fall semester).

- 2.2. Credit hours: 3
- 2.3. Semester offered (check all that apply): Fall Spring Summer
- 2.4. Anticipated enrollment per semester offered: Fall _____ Spring 45 Summer _____
- 2.5. Format (for online courses, please also complete Part 4 Addendum). Check all that apply and include the contact hours per week of each format being used.
- Lecture 3
- Lab _____
- Field _____
- Studio _____
- Online _____
- Other _____

If other checked above, please explain:

- 2.6. Level of instruction :
- Lower Division Upper Division Beg. Graduate Adv. Graduate
- 2.7. Is this a general education course? Yes No
- 2.8. Is this a required course? Yes No
- If yes, please list the program(s) for which it is a requirement:
B.S. in Environmental Resources Engineering
- 2.9. Is this course an elective within your department? Yes No
- 2.10. Is enrollment in this class restricted? Yes No
- If yes, please explain:
- 2.11. Are other ESF or SU courses similar or identical to this course? Yes No
- If yes, please identify the courses:
- 2.12. Is this course a shared resource offering? Yes No
- If yes, what is the course number of the concurrent offering?
ERE 580

- 2.13. **Student Learning Outcomes:** Identify the student learning outcomes associated with this course.

At the completion of this course students will be able to:

1. Understand the importance of fate and transport of contaminants in global, regional and local environmental issues.
2. Describe fundamental physical, chemical, and biological principles of fate and transport of contaminants in natural and engineered environments.
3. Apply the fundamental principles to identify, conceptualize, formulate, and solve complex contamination problems.
4. Explain fate and transport of common contaminants in various environments.
5. Acquire new knowledge of contemporary contamination issues by team-based review of scientific literature.
6. Discuss social, environmental, and health impacts of contamination issues.

- 2.14. **Major concepts, processes or tools:** Identify the course content and themes (e.g. Table of Contents) consistent with the learning domains and outcomes.

This course will cover the following concepts:

1. Basic concepts:
 - a. Chemical concentration, control volumes, mass balance
 - b. Advective/Fickian transport, the advection-dispersion-reaction equation
 - c. Basic environmental chemistry and physical chemistry
 - d. Chemical distribution among phases
2. Surface waters:
 - a. Physical transport in surface water
 - b. Sediment transport, particle settling, sediment record
 - c. Air-water exchange
 - d. Acid-base chemistry, redox chemistry
 - e. Dissolved oxygen modeling
 - f. Biotransformation and biodegradation, modeling biodegradation
 - g. Bioconcentration and bioaccumulation
 - h. Abiotic chemical transformation
3. Subsurface environment:
 - a. Flow of nonaqueous phase liquids
 - b. Retardation
4. Atmosphere:
 - a. Atmospheric stability and circulation
 - b. Transport of chemicals in the atmosphere
 - c. Physical removal of chemicals and chemical reactions
 - d. The greenhouse effect and global climate change

- 2.15. **Instructional methods:** Identify the methods used to meet the course outcomes, as well as the principal instructional methods.

Delivery:

1. Lectures on major concepts, supported by reading textbook, relevant journal articles, agency documents, and pertinent multimedia resources.
2. Discussion of assigned readings and supplementary materials.
3. Guest lecture by professionals in the wastewater/solid waste treatment area.
4. Seminar discussion on contemporary contamination issues and research papers developed in the concurrent offering ERE 580.

Evaluation:

1. Pre- and post-course surveys to check whether students understand the importance of fate and transport of contaminants in global, regional and local environmental issues.
2. In-class quizzes that require students to describe fundamental principles of fate and transport and common contaminants in natural and engineered environments.
3. Weekly/biweekly assignments that require students to apply fundamental principles to identify, conceptualize, formulate, and solve complex environmental resources engineering problems.
4. Exams that require students to describe and apply fundamental principles, and explain common contaminants in various environmental compartments.
5. Active participation in seminar discussion on contemporary contamination issues.
6. Report summarizing team-based review of scientific literature and seminar discussion.

- 2.16. **Course history:** Provide the dates of prior approval of this course, and its revision history. For new courses, enter not applicable.

This course was approved by the ESF Committee on Curriculum on April 30, 2015. A major revision was approved by the ESF Committee on Curriculum on April 12, 2021.

- 2.17. **Catalog description (max 1000 characters):** Provide the course description to be included in the ESF catalog

Format: Three hours of lecture per week.

Brief description. If this is a shared resource course, include “Credit will not be given for both 3XX and 5XX”:

The fundamental physical, chemical, and biological principles of fate and transport of contaminants. Application of the fundamental principles to analyze complex contamination problems in surface waters, subsurface environment, atmosphere, and engineered environments. Contemporary contamination issues.

Note: Credit will not be granted for both ERE 480 and ERE 580.

Semester(s) offered: Spring

Pre/co-requisites: Calculus II (APM 206), General Chemistry II (FCH 152), and Ecological Engineering (ERE 275), or equivalent.

3. New Institutional Impacts

This section pertains to forecasting institutional resource needs to support the course or course revision. Provide clear statements regarding the needs and current availability (or absence) of resources. **Note that, if this is a course revision, only the impacts of the revision should be included.**

3.1. Staffing needs:

3.2. Classroom resources (physical facilities in a laboratory, lecture hall, flexible space, academic computing):

3.3. Technology resources: (e.g., electron microscopes, UAVs, GPS receivers, survey equipment, etc.)

3.4. Computing resources (software licensing, hardware, access):

3.5. Library resources (subscriptions, services):

3.6. Transportation requirements (budget, fees, fleet, vehicles):

3.7. Will there be a course fee required? Yes No

3.8. Forest properties or field practicum facilities (Note: Please contact Forest properties each semester to schedule):

4. Online Course Addendum (only complete for online or hybrid course formats)

4.1. Online Course Format:

- Asynchronous online (no required real time class meetings)
- Synchronous online (all class meetings in real time)
- Combined online (asynchronous with some required synchronous class meetings)
- Hybrid (In person course with at least 1 credit of work/class meetings held online)

4.2. If there are any real time or live class meetings, how often and how long do you expect them to be?

Course Needs

- 4.3. Will you be using Blackboard at SU as your learning management system? Yes No
If no, please explain. Who will provide technical support and troubleshooting for students?

4.4. Which of the following institutional or supported tools will you be using (check all that apply)?

- Zoom
- Blackboard Collaborate
- Kaltura Media
- CNS Computer labs
- Other:

- 4.5. Will students need to use specialized software? Yes No
If yes, will it be made available to them through the institution, or will they need to purchase it separately?

- 4.6. Will students need any additional computer hardware, such as a webcam, microphone, or camera? Yes No

If yes, what equipment will they need?

Interaction & Assessment

4.7. What are two specific ways that you will provide substantive interaction in your course?

4.8. What is the proposed schedule of regular interaction in the course?

4.9. How will student academic engagement and success be monitored throughout the course?

4.10. How often and by what methods will students be assessed in the course?

5. Health and Safety Considerations

Will any of the conditions or situations outlined below be present in association with the course?

	Yes	No
5.1. Will substances with any of the following properties be used during instruction: flammability, toxicity, corrosivity, reactivity, registered pesticide, legally controlled, or other characteristics with the potential to cause harm or injury?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.2. Will any physical hazards be present during instruction? (e.g. machines that need safety guards; razor blades or syringes; compressed gases, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.3. Will any biological hazards be present during instruction? (e.g. handling animals [rabies or hantavirus]; cultures or stocks of infectious agents [fungal spores, viruses, bacteria, etc.]	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.4. Will any radiation hazards be present during instruction? (e.g. radiosotopes, X-rays, ultraviolet rays, lasers, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.5. Will any electrical equipment that, due to its design, location, or method of use, pose any threat to safety during instruction? (Give considerable thought to electrical use outdoors, or any potentially wet location)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.6. Will there be any personal safety issues related to the class? (e.g. due to time of day or location, at the end of any organized class exercise, will students be in danger of physical assault, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.7. Will any students be driving official state or research sponsored land or water vehicles during any class or instructional exercise?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.8. Will any type or personal protective equipment be necessary during class exercises? (e.g. hard-hats, eye/face protection, hearing protection, hand/foot protection, lab coat, visibility clothing, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the answer was "yes" to any of the health and safety questions, please explain:

For lab and field courses to which all answers are "no", you should explain that here, also. Normally, we would expect some safety precautions for such courses.

6. Approval Signatures:

All signatures and department level approvals are needed prior to submission to the Academic Affairs Committee.

Yaqi You Digitally signed by Yaqi You 2/3/22
Date: 2022.02.03 13:16:30 -05'00'

Department Academic Affairs Committee Representative (if applicable) Date

Department Chair Date

Provost Date
(if proposal requires additional staffing or resources)

If your proposal will impact other departments/areas, please include email confirmation that those affected have been notified and approve of the change.