



**Course Name:** BEE 458/558 - Nonpoint Source Pollution Assessment and Control

**Course Number:** CRN: 19607

**Term Offered:** Spring 2021

**Credits:** 3 Credits

**Instructor name:** Hong Liu

**Instructor email:** [hong.liu@oregonstate.edu](mailto:hong.liu@oregonstate.edu)

**Instructor phone:** 541.737.6309

**Link to instructor bio or website:** <https://bee.oregonstate.edu/users/hong-liu>

### **Course Description**

This course is designed to (1) introduce and demonstrate methods for evaluating the extent, rate, timing, and fate of nonpoint source (NPS) pollutants in agricultural, rural residential, forested, and urban environments; and (2) require students to apply methods and design principles for evaluating and designing NPS control systems with incomplete information. The application, data, design criteria, and maintenance of common treatment practices (e.g., treatment wetlands, bioretention, green roofs, permeable pavement) will be discussed. Students will complete weekly homework and discussion assignments aimed at critical thinking about basic principles and processes in NPSP. Group design projects will also be required of all students. The target audience is both OSU students and the broader community (e.g., engineers and practitioners, regulators, watershed council coordinators).

**Prerequisites** - this course is open to graduate students and undergraduate juniors and seniors who have completed an introductory hydrology course (e.g., BEE 512, CE 412).

### **Communication**

Please post all course-related questions in the General Discussion Forum so that the whole class may benefit from our conversation. Please email your instructor for matters of a personal nature. The instructor will reply to course-related questions and email within 24-48 hours.

### **Technical Assistance**

If you experience computer difficulties, need help downloading a browser or plug-in, assistance logging into the course, or if you experience any errors or problems while in your online course, contact the OSU Help Desk for assistance. You can call (541) 737-3474, email [osuhelpdesk@oregonstate.edu](mailto:osuhelpdesk@oregonstate.edu) or visit the [OSU Computer Helpdesk](#) online.

### **Learning Resources**

No textbook is required for this course. Students will be assigned readings from textbooks, peer-reviewed literature, and agency reports. These materials will be provided to students throughout the term via Canvas. Fundamental concepts covered by the reading materials and assignments may not be included in lectures, but may be on the Midterm Exam.

For additional research, the OSU Library website includes a page dedicated to helping Biological & Ecological Engineering students find journal articles, government publications, data resources, and standards, found at <https://guides.library.oregonstate.edu/c.php?g=285875&p=1906612>

This course is offered through Oregon State University Extended Campus. For more information, contact:  
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**Note to prospective students:** Please check with the OSU Bookstore for up-to-date information for the term you enroll (<http://osubeaverstore.com/Academics/> or 800-595-0357). If you purchase course materials from other sources, be very careful to obtain the correct ISBN.

### **Canvas**

This course will be delivered via Canvas where you will interact with your classmates and with your instructor. Within the course Canvas site you will access the learning materials, such as the syllabus, class discussions, assignments, projects, and quizzes. To preview how an online course works, visit the [Ecampus Course Demo](#). For technical assistance, please visit [Ecampus Technical Help](#).

### **Measurable Student Learning Outcomes**

Student learning will be assessed using the following outcomes for the undergraduate and graduate sections:

- Demonstrate basic knowledge of terms and concepts
- Differentiate assessment methods for appropriateness
- Apply general engineering principles to new problems and situations
- Construct, manipulate, and interpret graphs of time series and spatial data
- Communicate problem, including design criteria and assumptions, and solutions effectively in writing

### **ABET Learning Outcomes**

In accordance with the Accreditation Board for Engineering and Technology (ABET) A-K learning outcomes, students completing this course will possess and be evaluated on their:

1. Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Ability to communicate effectively with a range of audiences

Assignments relevant to these three outcomes will be kept and shared with ABET evaluators.

### **Evaluation of Student Performance**

Student learning will be evaluated through homework assignments, participation in online discussions, reading quizzes, a midterm exam, and a term-long individual design project. Students enrolled in BEE 558 will have a more extensive set of term project deliverables than students enrolled in BEE 458.

Grades and overall evaluation of student performance will be based on course activities in the following proportions:

#### **BEE 458**

Weekly homework assignments – 40%  
Discussion board – 10%  
Quizzes – 5%  
Mid-term exam - 15%  
Final design project - 30%

#### **BEE 558**

Weekly homework assignments– 40%  
Discussion board – 10%  
Quizzes – 5%

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Mid-term exam - 15%  
 Final design project - 30%

For achieving graduate credit, BEE 558 students are requested to lead the discussion and respond to multiple posts on discussion board.

### Course Content

Week	Topic	Learning Activities	Due Dates
1	Introduction  NPSP sources, classes, and control  NPSP policy and TMDLs	Lecture videos/slides; Student introductions; Online discussion questions; Assignment 1 – 303(d) Lists and TMDLs	Initial posts (on discussion board) due: Thursday of week 1; Comments on posts due: Monday of week 2; Assignment 1 due: Friday of week 1.
2	Fate and transport of NPS pollutants in the environment	Lecture videos/slides; Online discussion questions; Assignment 2 – NPSP Conceptual Model, and Web soil survey	Initial post due: Thursday of week 2; Comment on posts due: Monday of week 3; Assignment 2 due: Friday of week 2.
3	Hydrology, soils, and NPSP	Lecture videos/slides; Assignment 3 – Land Use and runoff	Assignment 3 due: Friday of week 3.
4	Pollutant load estimation	Lecture videos/slides; Assignment 4 - Load Estimation; Term Project-phase I	Assignment 4 due: Friday of week 4; Term Project-phase I due Friday of week 7.
5	Major classes of BMPs for NPSP prevention and management	Lecture videos/slides; Midterm Exam; Assignment 5 - BMP Wiki; Online discussion questions	Assignment 5 due: Friday of week 5; Midterm due: Sunday of week 5; Post on discussion board due: Wednesday of week 6.
6	Hydromodification and forestry NPSP	Lecture videos/slides; Assignment 6: USEPA docs;	Assignment 6 due: Friday of week 6; Term project phase 2A due: Friday of week 8; 2B due: Friday of week 9.
7	Urban NPSP	Lecture videos/slides; Online discussion questions; Reading materials	Initial post due: Thursday of week 7; Comments on posts due: Monday of week 8; Reading quiz due: Sunday of week 7.
8	Agricultural NPSP	Lecture videos/slides; Reading materials; Term project phase 2A	Reading quiz due: Sunday of week 8; Term project phase 2A due: Friday of week 8.
9	Agricultural NPSP- BMP	Lecture videos/slides; Reading materials; Online discussion questions Term project-phase 2B	Initial posts on discussion board due: Thursday of week 9; Comments on posts due: Monday of week 10; Term project phase 2B due: Friday of week 9.
10	Emerging NPSP NPSP at the basin scale	Lecture videos/slides; Reading materials Term project-phase 3	Term project final report due: Friday of week 10.

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\*Lecture organization is subject to change. A detailed, and occasionally updated schedule will be maintained on Canvas.

## **Course Policies**

### **Assignments**

Students are expected to adhere to assignment guidelines for the Department of Biological and Ecological Engineering at Oregon State University for all work submitted in this course. Official guidelines can be found on Canvas under Start Here.

Assignments are due by 11:59pm Pacific Standard Time on the due date. Late assignments will be docked 5% for each day that the assignment is past due and will **NOT be accepted one week after the due date.**

### **Discussion Participation**

Students are expected to participate in all graded discussions.

### **Exams**

You are expected to complete the midterm exam and any other assigned quizzes on your own, without the assistance of other classmates, colleagues, friends, or relatives. Please see statement below regarding academic integrity.

### **Incompletes**

Incomplete (I) grades will be granted only in emergency cases (usually only for a death in the family, major illness or injury, or birth of a child), and if the student has turned in 80% of the points possible. If you are having any difficulty that might prevent you completing the coursework, please don't wait until the end of the term; let the instructor know right away.

### **Statement Regarding Students with Disabilities**

Accommodations are collaborative efforts between students, faculty and [Disability Access Services \(DAS\)](#). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 541-737-4098.

### **Expectations for Student Conduct**

Student conduct is governed by the university's policies, as explained in the [Office of Student Conduct: Information and Regulations](#).

### **Basic Needs Resources:**

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Human Services Resource Center (HSRC) for support ([hsrc@oregonstate.edu](mailto:hsrc@oregonstate.edu), 541-737-3747). The HSRC has a [food pantry](#), a [textbook lending program](#) and other resources to help. Furthermore, please notify the professor if you are comfortable in doing so. This will enable them to provide any resources that they may possess.

### **Reach Out for Success:**

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it's important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at [oregonstate.edu/ReachOut](http://oregonstate.edu/ReachOut). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255)

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## **Academic Integrity**

Students are expected to comply with all regulations pertaining to academic honesty. For further information, visit [Avoiding Academic Dishonesty](#), or contact the office of Student Conduct and Mediation at 541-737-3656.

OAR 576-015-0020 (2) Academic or Scholarly Dishonesty:

a) Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.

b) It includes:

(i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.

(ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.

(iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).

(iv) TAMPERING - altering or interfering with evaluation instruments or documents.

(v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

c) Academic Dishonesty cases are handled initially by the academic units, following the process outlined in the University's Academic Dishonesty Report Form, and will also be referred to SCCS for action under these rules.

## **Conduct in this Online Classroom**

Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the [university's regulations regarding civility](#).

## **Tutoring**

[NetTutor](#) is a leading provider of online tutoring and learner support services fully staffed by experienced, trained and monitored tutors. Students connect to live tutors from any computer that has Internet access. NetTutor provides a virtual whiteboard that allows tutors and students to work on problems in a real time environment. They also have an online writing lab where tutors critique and return essays within 24 to 48 hours. Access NetTutor from within your Canvas class by clicking on the Tools button in your course menu.

## **OSU Student Evaluation of Teaching**

Course evaluation results are extremely important and are used to help me improve this course and the learning experience of future students. Results from the 19 multiple choice questions are tabulated

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anonymously and go directly to instructors and department heads. Student comments on the open-ended questions are compiled and confidentially forwarded to each instructor, per OSU procedures. The online Student Evaluation of Teaching form will be available toward the end of each term, and you will be sent instructions via ONID by the Office of Academic Programs, Assessment, and Accreditation. You will log in to "Student Online Services" to respond to the online questionnaire. The results on the form are anonymous and are not tabulated until after grades are posted.