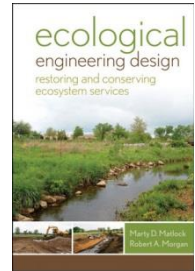


**BSEN 355**  
**Introduction to Ecological Engineering**

Spring Semester 2022  
Tuesday and Thursday, 2:00 – 3:15 p.m.

Introduction to principles of ecological engineering including ecosystems ecology, river restoration, constructed wetlands, green infrastructure stormwater management, and environmental restoration. Ecological design of water and land protection practices. Prerequisites: CHEM 110 or 111 or 114; and MATH 104 or 106. Recommended: AGEN/BSEN 350 or CIVE 352 or 353 or MSYM/WATS 354; and BIOS 101 or LIFE 121 or NRES 220.



**Textbook:** Matlock, M.D. and R. Morgan. 2011. Ecological Engineering Design: Restoring and Conserving Ecosystem Services. John Wiley and Sons, Inc., Hoboken, New Jersey.  
Available as an *ebook* through UNL library and hardcover in bookstore.

Other *ebook*, online, and handout references to be assigned.

**Course Website:** <https://canvas.unl.edu>

<b>Instructors:</b>	Dr. Tom Franti, Ph.D., P.E. 242 Chase Hall email: <a href="mailto:tfranti@unl.edu">tfranti@unl.edu</a>	Dr. Grant Clark, Ph.D., P.E. McGill University email: <a href="mailto:grant.clark@mcgill.ca">grant.clark@mcgill.ca</a>	Dr. Dave Wedin 411 Hardin Hall email: <a href="mailto:dwedin1@unl.edu">dwedin1@unl.edu</a>
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Teaching Assistant: Andrew Weigel, email: [andrew.weigel@huskers.unl.edu](mailto:andrew.weigel@huskers.unl.edu)

**Communications:** **Contact by email**  
**Office Hours: Zoom or In-person:** by appointment via email.  
**Canvas Announcements** used extensively (adjust Canvas to receive announcements)

**Learning Objectives:**

This course is designed to provide three fundamental learning objectives. After completing the course students should be able to: 1) plan the creation or management of an ecosystem to provide ecosystem services; 2) work effectively in an interdisciplinary, international team; and 3) work effectively using online tools to collaborate with remote colleagues. Specific technical learning objectives are:

1. Explain the basic principles and functions of ecosystems and understand the importance and design of ecosystem services. Outcomes 1
2. Compare current solutions to ecological engineering solutions, and examine ecological solutions to environmental problems and provision of ecosystem services. Outcomes 1, 2
3. Identify and use common ecological engineering approaches to river restoration, constructed treatment wetland design, low impact development, and bioretention. Outcomes 2, 5
4. Create an ecological engineering design using online design collaboration. Outcomes 2, 3, 4,
5. Communicate ecological engineering design ideas through various communication media. Outcomes 3

**ABET Outcomes:**

Assignments from this course will contribute to student's attainment of the following ABET Outcomes:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Knowledge Prerequisites:**

1. College level chemistry and calculus
2. Introductory biology and ecology
3. Understanding of hydrology, soils, and water balances
4. Use of spreadsheets, word processing, graphics, and computer-based programs, including social media communication technologies

**Course Prerequisites:** Prerequisites: CHEM 110 or 111 or 114; and MATH 104 or 106. Recommended: AGEN/BSEN 350 or CIVE 352 or 353 or MSYM/WATS 354; and BIOS 101 or LIFE 121 or NRES 220

**Course Learning Style Delivery**

This course will be delivered as a combination of in-person and online learning. Some material will only be available as pre-recorded video lectures and online learning modules. Students will be expected to attend designated in-person classes unless they have an approved accommodation, are in quarantine or isolation, or have an instructor-approved absence. The course delivery method will change throughout the semester as follows (and subject to change):

Weeks 1-6 – Flipped Classroom

- Tuesdays: In-person classroom learning
- Thursdays: Online learning via Zoom with no classroom meeting

Weeks 7-11- Blended Classroom – In-person lectures, Zoom, and Online learning: exact schedule TBD

Weeks 12-15 Remote Learning - Online Learning & In-person Field Tours

Note: Whether tours will occur depends on Covid-19 protocols.

**Class Project:**

Project teams will be assigned to complete an ecological engineering design project. Each team will be comprised of students from both McGill University and UNL. Teams will be expected to meet, collaborate on group projects, and post final assignments using online web tools and conferencing software. The project deliverables will be submitted mostly via the online collaborative platform Miro (Miro.com). Online file sharing software (Google, OneDrive, etc.) will also be used. The group design project is detailed in a separate document.

**Exam Scheduling:**

Take home exams, closed book exams, and quizzes will be used throughout the course. The closed book portion of exams will be conducted through the Digital Learning Center Exam Commons (DLC). The DLC has two locations, one is located in the Adele Coryell Hall Learning Commons in Love Library North and the other is in the new Dinsdale Family Learning Commons on East Campus. All exam times must be pre-scheduled by students in advance. Schedule exams at: <https://dlc-reserve.unl.edu>. DLC introduction video available here: <https://its.unl.edu/dlc/>. Scheduling conflicts because of changes will be resolved per the Missed Exam or Quiz policy below, or in consultation with the instructor.

**Exam Schedule: Exam 1: February 24-25; Exam 2: April 7-8; Exam 3 (Final): Thurs-Fri, May 12-13.**

**Late Assignments and Missed Exam or Quiz:**

Assignments turned in past due will be reduced in grade as follows:

- If submitted late, but within 24 hours of when due the maximum score will be reduced by 25% from full points.

If submitted between 24 and 48 hours of when due the maximum score will be reduced by 50% from full points.

If submitted more than 48 hours of when due the homework will be scored at zero points.

If negotiated beforehand for extenuating medical, personal, or professional circumstances, homework may be submitted late with no points penalty.

Make-up exams or quizzes may be allowed for extenuating medical, personal, or professional circumstance, and if the instructor is informed of expected absences prior to the date of the exam or quiz. Make-up exams or quizzes are at the sole discretion of the instructors, and instructors reserve the right to create an alternate exam or examination method for make-up exams and quizzes. Quizzes and exams missed will be scored zero points.

### **Final Exam:**

The UNL final exam time is scheduled for 3:30 to 5:30 p.m. Thursday, May 12. The closed book portion of the final exam will be according to the schedule above. A take-home portion of the final exam may be due on a date prior to or later than May 12, as agreed upon by the instructor and students.

### **Grading:**

The grade for this course will be determined by the following activities:

Participation	15%	(focused on student team participation)
Exams/Quizzes	40%	
Homework	25%	
Project	20%	(all members of team receive same team grade)

The following scale will be used to determine the final letter grade. Points will be accrued for all homework, exams, quizzes, and project work, and your final total points will be adjusted (curved) for total class performance.

A+	98 - 100%	B+	88 - 89%	C+	78 - 79%	D+	68 - 69%
A	92 - 97%	B	82 - 87%	C	72 - 77%	D	62 - 67%
A-	90 - 91%	B -	80 - 81%	C -	70 - 71%	D -	60 - 61%
						F	0 - 59%

### **Academic Honesty:**

Students are expected to adhere to guidelines concerning academic dishonesty outlined in Section 4.2 of the University's Student Code of Conduct (<http://stuafs.unl.edu/ja/code/>). The BSE Department process for grade and academic dishonesty appeals can be found at <http://bse.unl.edu/academicadvising-index>. Students are encouraged to contact the instructor for clarification of these guidelines if they have questions or concerns.

### **Covid 19 Protocols**

UNL currently requires face coverings indoors, including in classrooms and labs and at UNL events, until further notice. Students should follow all UNL Covid policies while in class and in Chase Hall. Find more at: <https://covid19.unl.edu/>

### **Students with Disabilities:**

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

## **Inclement Weather Policy**

UNL's inclement weather campus closing options regarding classes are the following:

- all classes are canceled.
- in-person classes are canceled and follow instructional continuity plans.
- all classes are conducted as usual.

*In the event of inclement weather when UNL campus is closed, instructional continuity plan directions will be posted in Canvas Announcements (email) regarding the instructions for BSNE 355 students.* This may include continue working on your own, read course materials, view video lectures, or work on an assigned project. Class may meet via web conference (Zoom) or another mode, at the same time as the regularly scheduled class. These class meetings will be recorded and made available to all students. You will be informed via Canvas Announcements if it becomes necessary to alter requirements, assignment deadlines, or grading procedures due to any university closure.

## **Emergency Response:**

**Fire Alarm (or other evacuation):** In the event of a fire alarm: Gather belongings (Purse, keys, cellphone, N-Card, etc.) and use the nearest exit to leave the building. Do not use the elevators. After exiting notify emergency personnel of the location of persons unable to exit the building. Do not return to building unless told to do so by emergency personnel.

**Tornado Warning:** When sirens sound, move to the lowest interior area of building or designated shelter. Stay away from windows and stay near an inside wall when possible.

### **Active Shooter**

**Evacuate:** if there is a safe escape path, leave belongings behind, keep hands visible and follow police officer instructions.

**Hide out:** If evacuation is impossible secure yourself in your space by turning out lights, closing blinds and barricading doors if possible.

**Take action:** As a last resort, and only when your life is in imminent danger, attempt to disrupt and/or incapacitate the active shooter.

**UNL Alert:** Notifications about serious incidents on campus are sent via text message, email, unl.edu website, and social media. For more information go to: <http://unlalert.unl.edu>.

Additional Emergency Procedures can be found here:

[http://emergency.unl.edu/doc/Emergency\\_Procedures\\_Quicklist.pdf](http://emergency.unl.edu/doc/Emergency_Procedures_Quicklist.pdf)

## **Additional Campus Support Resources:**

**Counseling and Psychological Services (CAPS)** provides **confidential** counseling services and to help support your well-being.

**UNL CAPS:** [Learn more or book an appointment here](#)

UNL offers a variety of options to students to aid them in dealing with stress and adversity. Counseling and Psychological & Services (CAPS) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450. Big Red Resilience & Well-Being provides one-on-one well-being coaching to any student who wants to enhance their well-being. Trained well-being coaches help students create and be grateful for positive experiences, practice resilience and self-compassion, and find support as they need it. BRRWB can be reached by calling 402-472-8770.

### **UNL Title IX**

UNL Title IX Resources & Contact Information: <https://www.unl.edu/equity/title-ix>

UNL Title IX Training for Students is available my MyRED: <https://myred.nebraska.edu>

UNL Victim Resources: <https://womens-center.unl.edu/victim-resources>

UNL Office of Academic Success & Intercultural Services (OASIS): <https://www.unl.edu/oasis/>

UNL LGBTQA+ Resource Center: <https://lgbtqa.unl.edu/welcome>

UNL Women's Center: <https://womens-center.unl.edu/>