SYLLABUS
FABE/ENR 5310
Ecological Engineering and Science
Spring 2020  4 credit hours

COURSE OVERVIEW

Instructors

Jay Martin, Department of Food, Agriculture & Biological Engineering
Email address: martin.1130@osu.edu
Office hours by appointment: 230C Agricultural Engineering

Elizabeth Myers Toman, School of Environment and Natural Resources
Email address: toman.11@osu.edu
Office hours by appointment: 414E Kottman Hall

Teaching Assistant

Jeffrey Kast, Department of Food, Agricultural & Biological Engineering
Email address: kast.14@osu.edu
Office house by appointment: 250 Agricultural Engineering

Course meetings

Days: MW  Time: 9:10a-11:00am  Location: Kottman Hall 104

Prerequisites

Junior standing with at least one course in one of the following subject areas; biology, ecology, engineering, or geology.
Course description

Definition, classification, and practice of ecological engineering. Course describes ecosystems, ecosystem restoration, and the utilization of natural processes to provide societal services and benefits to nature. It provides the basic background for design of an ecological engineering project and for some of the practices that make up ecological engineering such as river revitalization, wetland design, and runoff management.

Course learning outcomes

By the end of this course, students should successfully be able to:

- Identify the key physical, biogeochemical and ecological processes occurring in ecosystems and utilize these processes to provide societal services;
- Identify the benefits of ecological engineering technologies (i.e., holistic solutions, energy savings, costs savings);
- Apply natural processes to guide restoration and creation of ecosystems; and
- Understand the fundamental design considerations of ecologically engineered systems.

These objectives will be achieved with a combination of lectures, assigned exercises, readings, and a design project. A detailed class schedule, listing the topics that will be taught is attached.

COURSE MATERIALS AND TECHNOLOGIES

Textbooks and Readings


Additional readings will be assigned throughout the course and will be available through Carmen.

Course technology

For help with your password, university e-mail, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at https://ocio.osu.edu/help/hours, and support for urgent issues is available 24x7.
• Self-Service and Chat support: [http://ocio.osu.edu/selfservice]
• Phone: 614-688-HELP (4357)
• Email: 8help@osu.edu
• TDD: 614-688-8743

REQUIRED SOFTWARE

• **Microsoft Office 365:** All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft’s Student Advantage program. Full instructions for downloading and installation can be found [https://ocio.osu.edu/kb04733](https://ocio.osu.edu/kb04733).

GRADING AND FACULTY RESPONSE

**How your grade is calculated**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Assignments (4)</td>
<td>24</td>
</tr>
<tr>
<td>Mid-term Exam I</td>
<td>20</td>
</tr>
<tr>
<td>Mid-term Exam II</td>
<td>20</td>
</tr>
<tr>
<td>Project – Preliminary Presentation</td>
<td>5</td>
</tr>
<tr>
<td>Project – Final Presentation</td>
<td>10</td>
</tr>
<tr>
<td>Project - Report</td>
<td>16</td>
</tr>
<tr>
<td>Class Participation</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*See course schedule, below, for due dates.*

**Methods of Instruction**

The lecture and reading content will expose you to a fundamental understanding of ecological engineering in order to achieve the course objectives listed above. The lectures will also be built around the design project that the class will work on during the quarter.
A weekly reading assignment is posted before lectures each week and in-class discussion will center on the reading assignment. Some lecture time each week will be reserved for group work and discussion of the design project.

**Design Project**

This problem-based learning course will focus on applying the concepts of Ecological Engineering to stormwater runoff at the Quarry Metro Park. The class will be divided into groups and each group will work on one project. Each group will deliver a short oral presentation (during class) to present the preliminary ideas. A final oral presentation will be delivered in class during the last scheduled week of the semester. A written report detailing the proposed project will be due on the last scheduled day of the term.

**Assessment Tasks**

Your course grade will be based on 100 possible points, as detailed below. Homework assignments will assess how well you can synthesize the material presented in lecture. Two midterms will determine your degree of mastery of specific material covered in the course. Class participation points will be assigned at the instructors’ discretion and will be determined through participation in class discussions as well as attendance at site visits and field trips (scheduled during lecture time periods). For group assignments, group members will receive a similar grade, UNLESS there are major discrepancies in individual contributions as indicated by student feedback.

**Preparedness and Late Assignments**

As we are sure you expect us to be well prepared and come to class for every session, we expect the same from you. If you must leave class early please let one of us know. **We do not accept late assignments.**

**Email Correspondence**

In order to protect your privacy, all course e-mail correspondence must be done through a valid OSU name.# account.

**Grading scale**

- 93–100: A
- 90–92: A-
- 87–89: B+
- 83–86: B
- 80–82: B-
- 77–79: C+
- 73–76: C
- 70–72: C-
- 66–69: D+
- 60–65: D
- Below 60: E
OTHER COURSE POLICIES

Ohio State’s academic integrity policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an “excuse” for academic misconduct, so we recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If we suspect that a student has committed academic misconduct in this course, we are obligated by University Rules to report our suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact us.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.htm)

Statement on title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to
offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

Your mental health

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the quarter are encouraged to contact the College of Pharmacy Office of Student Services in room 150 Parks Hall (614-292-5001) OR OSU Counseling and Consultation Services (614-292-5766) for assistance, support and advocacy. This service is free and confidential.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to http://ods.osu.edu for more information.
# TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Instructor</th>
<th>Readings &amp; Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>6-Jan</td>
<td>Intro to Ecological Engineering, Definitions and Principles</td>
<td>Jeffrey Kast/Jay Martin</td>
<td>Mitsch and Jorgensen (2004) Chpts 1, 2, 3, &amp; 5</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>15-Jan</td>
<td>Project Introduction</td>
<td>Larry Peck/Elizabeth Myers Toman</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>5</td>
<td>3-Feb</td>
<td>Water and Wetland Treatment Systems</td>
<td>Jay Martin</td>
<td>Mitsch and Jorgensen (2004) Chpt 10</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
<td>5-Feb</td>
<td>Living Machines</td>
<td>Jay Martin</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>10-Feb</td>
<td>Exam Review</td>
<td>Jay/Elizabeth</td>
<td>MIDTERM I</td>
</tr>
<tr>
<td>11</td>
<td>6</td>
<td>12-Feb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>7</td>
<td>17-Feb</td>
<td>Hydrology-Water Runoff &amp; Projects</td>
<td>Jay Martin</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>7</td>
<td>19-Feb</td>
<td>Site Visit</td>
<td>Larry Peck</td>
<td>Meet on Site, Weather dependent</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Event Description</td>
<td>Instructor(s)</td>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>-------------------</td>
<td>----------------</td>
<td>-------</td>
<td></td>
</tr>
</tbody>
</table>
*Homework #3 Due Mar 4* |
| 14   | 9    | 26-Feb | Preliminary Project Presentations | Students   |       |
*Homework #4 Due March 18* |
| 17   | 13   | 9-Mar |  
*NO LECTURE – Spring Break* |       |       |
| 18   | 15   | 1-Mar |  
*NO LECTURE – Spring Break* |       |       |
| 19   | 13   | 23-Mar | Design Workshop | Jay/Jeffrey |       |
| 21   | 15   | 30-Mar | Exam Review | Jay/Elizabeth |       |
| 21   | 15   | 1-Apr | MIDTERM II |       |       |
| 22   | 15   | 6-Apr | Wetland delineation | Elizabeth Myers Toman |       |
| 23   | 15   | 8-Apr | Wetland delineation - outdoor lab | Elizabeth Myers Toman | Meet at Schiermeier Wetland Research Park |
| 24   | 15   | 13-Apr | Trip to Olentangy | Guest |       |
| 25   | 15   | 15-Apr | Report Workshop | Jeffrey/Elizabeth |       |
The Final Project and Report will serve as the Final Exam