**ECOSYSTEM ECOLOGY** (Bio 386/586)

Lecture 1:50-2:50 Mon.,Wed. (HS 212) Lab 3:00-5:00 Mon. (HS 51)

Dr. Bob Stelzer

**Contact Information**

# Office Hours Location Phone E-mail

Mon. 10:30-11:30 Halsey 150 424-0845 stelzer@uwosh.edu

Wed. 3:00-4:00

and by appointment

## Textbooks/Readings

*Principles of Terrestrial Ecosystem Ecology*, 2nd edition. 2011. F. Stuart Chapin, Pamela A. Matson, and Peter M. Vitousek.

Papers for discussion or background reading on D2L (see schedule)

Lab descriptions on D2L (see schedule)

### Overview and Goals of Course

Ecosystem Ecology focuses on how aquatic and terrestrial ecosystems operate with emphasis on the flow of energy and matter and the factors that regulate these processes. Because ecosystems cannot be understood without some knowledge of other fields such as chemistry and hydrology, we will borrow from these disciplines when appropriate. Understanding the roles of species and communities in ecosystem dynamics is important so we will also draw on other areas of ecology. Considerable time will be spent investigating the methods scientists use to study ecosystems. The labs will introduce you to some of these methods. The goals of the course are: 1) to develop an introductory-level understanding of ecosystems and ecosystem processes, 2) to learn a variety of approaches and methods used in the study of ecosystems, 3) to be able to apply knowledge about ecosystems and the factors regulating them to new situations, and 4) to further your training as scientists.

##### Evaluation

You will be evaluated based on 2 lecture exams, 2 lab reports, a group research project, the quantity and quality of your contributions to class discussions, participation during lecture and lab activities, and problem sets. Your group research project grade will be based on a proposal, the quality of the work and effort displayed throughout the semester, and the final presentation. I expect that all members of the group will make equal contributions to the group project.

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| Activity | Percentage of Grade |
| Lecture exam 1  Lecture exam 2 | 15%  15% |
| Metabolism lab report (short)  Phosphorus uptake lab report (short) | 10%  10% |
| Group research project  \* proposal – 10%  \* quality and effort – 10%  \* final presentation – 15% | 35% |
| Discussion and participation | 7.5% |
| Problem sets and data sets | 7.5% |

**Grading Scale**

A 91-100

A- 89-90

B+ 87-88

B 80-86

B- 78-79

C+ 76-77

C 70-75

C- 68-69

D+ 66-67

D 60-65

D- 58-59

F < 58

Graduate students must earn a C or higher to pass the course. No D grades are available for graduate students.

Exams must be taken and assignments must be turned in at the beginning of the class period on the due dates indicated in the Lecture and Lab Schedule. Make-up exams or extensions of due dates will only be given if there is a valid, documented excuse (e.g. illness, family emergency). You will need to contact me within 24 hours of the missed activity if you have an excused absence so that you can arrange to make up a missed assignment without penalty. If assignments are turned in late for an unexcused reason (e.g. oversleeping; needing more time to complete the assignment because of busyness; auditions for American Idol) 15% will be deducted from the earned points for every day an assignment is late. After the second late assignment, no further late assignments will be accepted (therefore you will get 0 points for those assignments). Make-up exams must be taken within one week of the missed exam. Make-up exams will not be identical to the original exams.

The lab report will entail answering a series of questions. All lab reports must be turned in as hard copies. E-mailed lab reports will not normally be accepted.

**Students with Disabilities:** Students who have disabilities who wish to request academic adjustments should notify Disabilities Services so that appropriate accommodations can be made. For more information call or visit Disabilities Services (**424-3100, Dempsey 125A) or see me.**

**Academic Integrity:** If you decide to cheat on an exam or to engage in other forms of academic dishonesty you will be subject to the Student Academic Disciplinary Procedures as outlined in the Student Disciplinary Code-www.uwosh.edu/stuaff/images/student-discipline-code. Plagiarism has serious consequences. Examples of plagiarism are 1) “lifting” whole sentences/paragraphs from a source and including this material in your paper or lab report in an unaltered or slightly altered form, 2) copying the work of another student and including it in your lab report and 3) paraphrasing from a source without citing that source.

**Electronic Devices:** Cell phones must be turned off at all times during all class activities including field trips. If you need to have a cell phone on for some reason (e.g. to receive an emergency message during a field trip) I ask that you let me know ahead of time and engage the vibrate setting. Tablets or laptops are fine to use for class purposes.

**For Graduate Students (enrolled in Bio 586):** In addition to the goals listed in the “Overview and Goals of Course” section above graduate students are expected to: 1) Display leadership qualities in lecture and lab, especially during class discussions, 2) Write a critical review of a published paper of your choice in the field of ecosystem ecology. The paper will account for 10% of your grade. To account for this change the contribution of the following categories towards your overall grade will be modified (short lab reports 15% total, exams 25% total). I ask that graduate students meet with me early in the semester to discuss this assignment.

## Lecture and Lab Schedule

An asterisk in the schedule indicates 3 hr lab (regular lab slot + lecture slot on Monday) and in one

case a 4 hr lab. GH = Halsey Greenhouse (5th floor)

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| Week | Readings | Lecture | Lab | Lab  Meets |
| 30 Jan-  3 Feb | *Weathers, Strayer and Likens 2013*  Chp. 1 PTEE (optional) | Introduction;  Historical development of ecosystem concepts | Introduction to Group Research Projects | HS 51 |
| 6-10  Feb | Chp. 6 PTEE  Chp. 5 PTEE (optional) | Primary production in terrestrial and aquatic ecosystems | Introduction to metabolism lab  **Group Research Project meetings; topics due Feb 6** | HS 51 |
| 13-17  Feb | *Rubbo et al. 2006* | Discuss *Rubbo et al.* paper;  **Group Research Project proposals due Feb 19 by 5 pm** | *Metabolism Lab-- Stream Biofilms\** | HS 51,  GH,  1:50-5 |
| 20-24  Feb | Chp. 10 PTEE | Secondary production; Trophic-level interactions;  **Metabolism Problem Set** **due Feb 22** | *Metabolism Lab:*  processing; **Metabolism spreadsheet due Feb. 24 by 5 pm**; Group Research Project preparation | HS 51 |
| 27 Feb-  3 March | Chp.7 PTEE | Discussion of *Metabolism Lab* results; Decomposition | Group Research Projects | HS 51, GH |
| 6-10  March | Chp. 9 PTEE | Nutrient cycling in ecosystems;  **Mass Balance Problem Set due March 8** | ***Metabolism* Lab Report due March 6;** Group Research Projects | HS 51,  GH |

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| Week | Readings | Lecture | Lab | Lab  Meets |
| 13-17  March | *Slavik et al. 2004* | **Exam 1 (March 13)**;  Discuss Slavik et al. paper | Group Research Projects | HS 51, GH |
| 20-24  March |  | Spring Break! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* | Spring Break! \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* |  |
| 27-31  March | *Lewis et al. 2011;*  *Conley et al. 2009* | Eutrophication of freshwater and marine ecosystems; Discuss papers | *Phosphorus Retention Lab:* Introduction;  **Group Research Project meetings March 27** | HS 51 |
| 3-7  April |  | Ecosystem Experiments | *Phosphorus Retention Lab\* -* Spring Brook | HS 51, then field  1:50-6 |
| 10-14  April |  | Discuss results from  *Phosphorus Retention Lab* | *Phosphorus Retention Lab\* -*  phosphorus measurement | HS 51  1:50-5 |
| 17-21  April | Chp. 12 and 14 PTEE | Global climate change: pattern and process;  Temporal dynamics of ecosystems | Group Research Projects | HS 51,  GH |
| 24-28  April | *Findlay and Strayer 2013* | Biogeochemistry and redox reactions  **Exam 2 (April 26)** | Discuss *Phosphorus Retention* Lab; Group Research Projects | HS 51,  GH |
| 1-5 May |  | Group Research Project Meetings | ***Phosphorus Retention-* Short Lab Report Due May 1;**  Wetland field trip | HS 51, then field |
| **8-12 May** |  | **Group Research Presentations (May 8)** |  |  |