

## Plant Community Ecology

Fall 2014

Professor: Dr. Amy Freestone

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Course Number: Undergraduate: 3321

Graduate: 5321

Description: This class focuses on fundamental principles in community ecology as they relate to plant systems. The scope of the class ranges from plant-environment interactions and species interactions, to the relationship among communities at larger spatial scales. Lectures and small group discussions will also highlight theoretical and empirical advances made in ecology through classic and contemporary studies of plant communities.

Prerequisites for Undergraduate Students: Biology 2227 with a grade of C or better.

Course day, time, and location: 11am-12:20pm, Tuesdays & Thursdays, BIOSCI 342

Office Hours: 12:30am-2pm, Tuesdays & Thursdays, Bio-Life Science Building Room 453B, and by appointment.

Learning Objectives: The primary goals of this class are to have students gain:

- (1) A deeper understanding of the principles of community ecology.
- (2) An appreciation for the unique characteristics of plant systems that define their community dynamics.
- (3) An understanding of the ecological advances that emerged from studies of plant communities.
- (4) A familiarity with reading, understanding, and critiquing the primary literature.
- (5) An ability to synthesize course information and apply this knowledge to emerging challenges, such as predicting plant community dynamics in a changing world.

Course Approach: Topics will generally be covered in two class periods. The first class will primarily be a lecture with short interactive activities, videos, and discussions to highlight central themes of the material. Lectures will be presented as PowerPoint presentations and will be based on material from the textbook, the published ecological literature, and current faculty research. The second class will be a student-led discussion of a reading from the primary literature that complements the lecture material.

We will also have three field classes for students to experience ecological research first-hand. Two regularly-scheduled classes will be used for a dendrology unit for students to learn and practice field identification of woody plants. We will follow this unit with a full day (Saturday) field trip to a local forest where students will participate in data collection on woody plant communities. We will analyze our data set as a class, and students will prepare a Research Report on their findings.

Reading Assignments: Required readings are assigned from the primary literature and are posted on Blackboard. These can also be accessed online through Temple Libraries. For students who would benefit from or enjoy more background information, suggested supplementary readings (SSR) will be from The Ecology of Plants, 2<sup>nd</sup> Ed., Gurevitch et

al. 2006. Copies of the supplementary textbook are available in the bookstore and on reserve at Paley Library. Purchase of the textbook is not mandatory.

**Discussions:** **PARTICIPATION:** Students are expected to be active participants in all discussions, meaning each student should contribute to each discussion. On-time attendance is critical to a good discussion dynamic – tardiness will be reflected in participation grades. **LEADER:** Dr. Freestone will lead the first discussion. All other discussions will have 2 student leaders. Each student will be a discussion leader once. Leading discussion means coming to class prepared with (1) a brief summary of the study to present at the beginning of class and to initiate the discussion, (2) an outline of the different elements of the study (intro, methods, results, discussion) and the important points to raise to the class in each section as we move through the paper, and (3) a list of open-ended discussion questions to intersperse throughout the discussion (a list of possible questions are included below, which all students should have prepared answers for in advance). If there is a lull in the discussion, it is the discussion leaders' responsibility to keep the dialogue going and to make sure all students are participating.

For each paper we read for discussion, all students (leaders and participants) should come to class with prepared notes that answer the following questions:

1. What are the specific goals of the study?
2. What methods did the authors use to meet their goals and why were those methods chosen?
3. What are the main conclusions and implications/significance of the research?
4. What are the strengths of the study?
5. What are the weaknesses/limitations of the study?
6. What could the authors do next to build on their study?
7. How does this paper relate to other material we've read this semester?

This activity is to help you think critically about the paper and prepare for discussion. While these notes will not be collected, lack of preparation for discussion will be reflected in student's participation grades. The more you think critically about the assigned reading in advance of class, the more you will be able to contribute to discussion.

**Attendance:** On-time attendance for all class activities is required. Unexcused absences will result in a zero participation grade for that class. An unexcused absence for the Saturday field trip will result in a zero for the Research Report.

**Exams:** There will be two midterms and a no final. Questions will be presented as multiple-choice, fill in the blank and short answer. Questions will be drawn from the lectures, discussions, reading material, and field activities. Make-up exams will only be offered to students whose absences were approved in advance of the original exam date. Approved absences will only be granted for activities that are university sanctioned or that would provide you with a significant opportunity for learning or professional development. Day-of absences will only be approved with a doctor's note.

**Field Research and Research Reports:** We will conduct field research on plant communities of the Wissahickon Valley (see Class Schedule). We will analyze the data together during a computer lab session. Students will then prepare a 1000-word Research Report on these activities. Figures, Figure legends, and Literature Cited do not count toward the word limit. The elements of this report should include:

- 1) Introduction: This section describes the theoretical background and rationale of the study. At least 10 papers from the primary literature should be cited in this section.
- 2) Methods: This section briefly summarizes the methods used in the study.
- 3) Results: This section reports the results of the study and should contain at least one figure that visually presents the data.
- 4) Discussion: This section includes your interpretation of the results. It should highlight the take-home message of the study and its significance.
- 5) Literature Cited: This section should list all references in alphabetical order, using any format that is employed by a major scientific journal.

Papers: Graduate students will be required to write a 10-page, double-spaced paper examining the historical roots and current status of a topic in community ecology, pulling both from theory and empirical plant studies. At least 15 references from the primary literature need to be cited. Papers are due on the last class, December 4<sup>th</sup>.

Grading:

	<u>Undergraduate</u>	<u>Graduate</u>
EXAM: Midterm 1	25%	20%
EXAM: Midterm 2	25%	20%
FIELD: Research Report	25%	15%
FIELD: Dendrology Quiz	2%	2%
DISCUSSION: Participation	13%	10%
DISCUSSION: Leader	10%	10%
GRADUATE: Paper		23%
<b><u>TOTAL</u></b>	<b><u>100%</u></b>	<b><u>100%</u></b>

Accommodations for students with disabilities: Any student who needs an accommodation based on the impact of a documented disability should contact me as soon as possible. We will then contact Disability Resources and Services at 215-204-1280 at 100 Ritter Annex to coordinate reasonable accommodations.

Honesty and Civility: You must abide by Temple's Code of Conduct (see <http://www.temple.edu/assistance/udc/coc.htm>), which prohibits:

1. Academic dishonesty and impropriety, including plagiarism and academic cheating.
2. Interfering or attempting to interfere with or disrupting the conduct of classes or any other normal or regular activities of the University.

Cell Phones: Sending or receiving calls or text messages during class is distracting to the instructor and your fellow classmates. Use of cell phones in class is not allowed.

Class schedule: Required readings are papers from the primary literature. Suggested Supplementary Readings (SSR) are from The Ecology of Plants textbook. Primary literature readings are listed here and are posted on Blackboard. These assigned readings are subject to change if new studies emerge that would provide better or timelier discussions. I will announce all changes in class and on Blackboard.

1- Aug 26, T	Introduction to Plant Community Ecology: Lecture	(SSR Section 3.9)
2-Aug 28, TH	Dispersal: Lecture	Nathan & Muller-Landau 2000 (omit Boxes 3 & 4); (SSR: Section 2.7-2.8 [pp. 179-202])
3-Sep 2, T	Dispersal: Discussion (Dr. Freestone lead)	Cordiero & Howe 2003
4-Sep 4, TH	Competition: Lecture (assign discussion groups)	(SSR: Section 3.10)
5-Sep 9, T	Facilitation: Lecture	Bruno et al. 2003
6-Sep 11, TH	Competition & Facilitation: Discussion	Bertness & Hacker 1994
7-Sep 16, T	Herbivory: Lecture	(SSR: Section 3.11)
8-Sep 18, TH	Herbivory: Discussion	Post & Pedersen 2008
9-Sep 23, T	Disturbance and succession: Lecture	(SSR: Section 3.12)
10-Sep 25, TH	Disturbance: Discussion	Seabloom et al. 2003
15-Sep 30, T	Diversity: Lecture	(SSR: Section 3.13)
16-Oct 2, TH	Diversity-Ecosystem Function: Discussion	Tilman et al. 2006_Science
17-Oct 7, T	Diversity-Stability: Discussion	Tilman et al. 2006_Nature
14-Oct 9, TH	<b>MIDTERM 1</b>	
11-Oct 14, T	Dendrology Lab - a walk around main campus	<i>Class meets at main entrance of Bio-Life Science Bldg.</i>
12-Oct 16, TH	Dendrology Lab (2) and <b>Quiz</b>	<i>Class meets at main entrance of Bio-Life Science Bldg.</i>
SAT, Oct 18 FIELD DAY (Rain date, SUN, Oct 19)	<i>We will be conducting field research in the Wissahickon Park in NW Philadelphia. Class meets at north end of Bio Bldg (on Norris St.) at 9am. Come with long pants, hat, socks, walking shoes, water, and a packed lunch. Estimated return: 4pm. This field day is weather-dependent and may be rescheduled if needed.</i>	
13-Oct 21, T	Field data computer lab	<i>Class meets in Bio-Life 126 – computer lab</i>
18-Oct 23, TH	Landscape Ecology: Lecture	(SSR: Section 4.15-16)
19-Oct 28, T	Landscape Ecology: Discussion	Chase & Leibold 2002
20-Oct 30, TH	Regional & global diversity: Lecture	(SSR: Section 5.19)
21-Nov 4, T	Regional & global diversity: Discussion	Karlson et al. 2004_Nature
22-Nov 6, TH	Global change: Lecture	(SSR: Section 5.21)
23-Nov 11, T	Global change: Discussion	Wright 2005
24-Nov 13, TH	Plant invasions: Lecture	Shea & Chesson 2002, Figure 1 from Wilson et al. 2008

25-Nov 18, T	Plant invasions: Discussion 1	D'Antonio et al. 2004_Fronteirs
26-Nov 20, TH	Plant invasions: Discussion 2 <b>(Research Report Due)</b>	Meyerson & Mooney 2007
27-Dec 2, T	Plant Invasions: Activity	TBA
28-Dec 4, TH	<b>MIDTERM II</b>	