

**Ecosystem Ecology  
Biology 5490  
Fall Semester, 2017**

**Instructor:** Dave Bowling

Office: Aline Skaggs Biology Rm. 442

Email: [david.bowling@utah.edu](mailto:david.bowling@utah.edu)

Office hours: T 10:30 am-12:00 pm, W 3:00-4:30 pm, or by appt.

**Teaching Assistant:** La'Shaye Cobley, email: [lae.Cobley@utah.edu](mailto:lae.Cobley@utah.edu)

Office Hours ASB 510, T 3-4:30 pm, F 10:30 am -12:00 pm

**Location and Time:** JTB 120, M-W, 1:25-2:45pm

**Textbook (required):**

*Principles of Terrestrial Ecosystem Ecology*, FS Chapin III, P Matson, P Vitousek, Springer-Verlag, New York, 2012 (2<sup>nd</sup> edition).

Other useful texts for those interested (not required):

*Terrestrial Ecosystems*, 2<sup>nd</sup> edition, JD Aber and JM Melillo, Harcourt Academic Press, San Diego, 2001.

*Biogeochemistry, An Analysis of Global Change*, 3<sup>rd</sup> edition, WH Schlesinger, ES Bernhardt, Academic Press, Amsterdam, 2013.

**Course Description:** This lecture course for upper division and graduate students will examine the biological, physical, and chemical factors that control cycling of elements such as carbon, nitrogen, and phosphorus within terrestrial ecosystems. Elemental cycles are a critical component of ecosystem function and vital to the stability of ecosystem processes. Topics will include the climate system, energy and water balance of ecosystems, ecosystem productivity, decomposition, carbon and nutrient cycling, soil chemistry, trophic relations, aquatic ecology, succession, disturbance, and fire ecology, land use change, and global biogeochemical cycles.

**Course Objectives and Learning Outcomes:** Each student will understand and be able to explain the general principles of ecosystem ecology, and why they are important for society. Students will understand the scientific basis for many of the environmental issues that society faces.

**Course Prerequisites:** This is an interdisciplinary class and there are students who are not Biology majors.

Required: CHEM 1220 or CHEM 1221 (Introductory Chemistry)

Recommended (prior or concurrent):

BIOL 1210 Principles of Biology

BIOL 3510 or CHEM 3510 (Biochemistry)

PHYS 2010, 2210, or 3210 (Introductory Physics)

## 2017 Ecosystem Ecology Syllabus

Date	Topic	Homework and Discussion Topic	Planned HW Due Date	Reading for Lectures	
21-Aug	Eclipse!				
23-Aug	Intro			Ch 1	
28-Aug	Climate			Ch 2	
30-Aug	Climate Change			Ch 2	
4-Sep	Labor Day holiday				
6-Sep		Discussion	Climate Change	5-Sep 5 pm	NAS Report
11-Sep	Energy and Water Balance			Ch 4	
13-Sep	Energy and Water Balance			Ch 4	
18-Sep	Energy and Water Balance			Ch 4	
20-Sep	<b>Exam 1</b>				
25-Sep	Soils			Ch 3	
27-Sep	Soils			Ch 3	
2-Oct	Disturbance			Ch 11, 12	
4-Oct	Disturbance	Disturbance	6-Oct 5 pm	Ch 12	
9-Oct	Fall Break				
11-Oct	Fall Break				
16-Oct		Disturbance + Discussion	Disturbance		
18-Oct	<b>Exam 2</b>				
23-Oct	Ecosystem Carbon Input			Ch 5	
25-Oct	Ecosystem Carbon Production			Ch 6	
30-Oct	Decomposition			Ch 7	
1-Nov	Decomp, Plant Nutrient Use			Ch 7, 8	
6-Nov	Nutrient Cycling			Ch 8, 9	
8-Nov	Nutrient Cycling			Ch 9	
13-Nov		Urban Ecology + Discussion	Urban Ecology	12-Nov 5 pm	TBA
15-Nov	<b>Exam 3</b>				
20-Nov	Species and Community Effects			Ch 11	
22-Nov	TBA				
27-Nov	TBA				
29-Nov		GMO Agriculture + Discussion	GMO Ag. Ecology	28-Nov 5 pm	TBA
4-Dec	Biological Soil Crusts - Dr. Jayne Belnap			belnap_03b.pdf	
6-Dec	World Population + Discussion				
12-Dec	<b>Take Home Assignment</b>	Population	12-Dec 11:59 pm	TBA	

**Midterm Exams:** There will be 3 midterm exams. These will consist of short answer and short essay questions, and you will be asked to draw diagrams of relevant processes. Some exam questions will be designed to encourage you to think critically about a topic, expecting you to build on concepts taught in class. No makeup exams will be given. If a true emergency prevents you from attending an exam, contact the professor as soon as possible with written, verifiable documentation and we'll try to work something out. No calculators or phones are allowed for exams.

**Homework and Take-Home Final Assignment:** There will be a total of 5 assignments involving contemporary ecosystem science topics (see schedule for topics). These will involve guided reading of the scientific literature and evaluating the topics in a critical thinking context. A written assignment (to be completed individually) will help to solidify your understanding, and during the next class period we will have a 20-30 min interactive discussion about the topic. The last topic will be assigned in lieu of a final exam and will be due on the day of the final exam. Written assignments will be due in pdf format via email, at 5 pm on the day prior to the discussion (see schedule).

**Grading:** Grades will be assigned in the usual fashion (90-100 A, 80-89 B, 70-79 C, 60-69 D, 0-59 F) weighted as follows:

Exams 1-3:	51 % (17 % each)
Homework:	34 % (8.5 % each)
Take-Home Assignment:	13 %
Participation:	2 %

This is a discussion-oriented class and we want you to be involved! You should participate fully in class, asking and answering questions, and generally promoting our collective learning experience. If you always participate your grade and our experience will benefit.

**Course website:** <http://courses.biology.utah.edu/bowling/5490>

Electronic (PDF) copies of all handouts from class, readings, exams, and exam keys will be made available on this site.

**Attendance and lecture notes:** Come to class! You are expected to attend all lectures, and you are responsible for taking your own notes during lecture. If you skip a lecture, obtain lecture notes from a fellow student in the class. Lecture notes will not be provided by the professor or teaching assistant if you skipped class. Handouts are available on the website as described above.

**Reading:** Readings from the textbook or other sources are assigned for each of the lecture topics. To get the most out of lecture, you should always read the assigned material before class. We can't possibly cover all the material in the book in class – if you want to learn about Ecosystem Ecology (and if you want to do well in this class) you need to read the book!

**Professor and TA office hours:** We will set aside several hours each week to meet with you to discuss concepts from class or anything else. Take advantage of this time. Don't be intimidated or afraid to ask questions – we are here to help and we want you to come to us with your questions. We'll meet with you individually, in groups, whatever. If you come outside regular office hours, we will probably ask you to come back another time (we have responsibilities beyond teaching this class). We're happy to make an appointment if you need one.

**Regrade request policy:** Questions regarding grading will be considered only if received in writing within one week of the day on which materials are returned in class (give to the TA). Don't wait until the semester ends or you will be disappointed when we turn you down.

**Cell phones:** Be respectful of your fellow students and turn them off before class. Students who use a cell phone in class will be asked to leave (this includes texting and surfing). This policy will be strictly enforced.

**ADA statement:**

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

**Academic Conduct:**

In order to ensure that the highest standards of academic conduct are promoted and supported at the University, students must adhere to generally accepted standards of academic honesty. Acts of academic misconduct include cheating, plagiarizing, research misconduct, misrepresenting one's work, and inappropriately collaborating. Suspected cases of academic misconduct are dealt with according to the rules found in the Student Code, University Policy 6-400:

<http://regulations.utah.edu/academics/6-400.php>

**“Offensive material” statement:**

This instructor does not grant accommodations to course content. Please review the syllabus carefully to see if the course is one that you are committed to taking.