

## BIOL 16: ECOLOGY

### GENERAL INFORMATION

#### **STAFF:**

<i>Professor:</i>	Rebecca Irwin (LSC 333)
<i>Laboratory Coordinator:</i>	Craig Layne (LSC 121)
<i>Graduate Assistants:</i>	Jacob Heiling (LSC 135) Andrew Sanders (LSC 135)

#### **OFFICE HOURS:**

Office hours for Professor Irwin will be during Bio 16 xhours on Thursdays 12-12:50 in LSC 333. That way everyone in the class has that timeslot open and can make office hours when they have questions.

Graduate assistants will also have office hours as follows:  
Jacob Heiling on Mondays 2-3 pm and Fridays 11:10-12:10 in LSC 135.  
Andrew Sanders on M and W 11:10-12:10 in LSC 135.

You can also set up one-on-one appointments to meet with any of us. The easiest way to make an appointment is via e-mail.

#### **TEXTS and READINGS:**

Required lecture readings will come primarily from scientific journals and the following text:

Molles, M. C. 2012. *Ecology: Concepts and Applications*, 6<sup>th</sup> edition.

Papers assigned from scientific journals will be available on Blackboard unless otherwise noted.

**LECTURES: M, W and F 10:00 to 11:05 in LSC 200.** Our x-period is TH 12:00-12:50 and will be used for office hours for Professor Irwin unless otherwise noted on the syllabus. On days where x-period is used for office hours for Professor Irwin, you can find her in LSC 333.

Attendance in lecture is not recorded, but your attendance is assumed because anything in lecture could be on the exams. Also, please be on time. Announcements are generally made at the beginning of class. If you are late, you may miss important information about the course. The exams will contain questions from lecture and lab.

#### **LABORATORIES:**

Attendance in laboratory is ***mandatory***. Labs meet in LSC 102 beginning with the second week of class (**22 September**). Labs meeting on Monday run from 3-7 pm; labs meeting other days of the week run 2-6 pm. You will hear from Craig Layne, the Lab Coordinator, confirming what day you have lab. Laboratories consist of field and laboratory activities such as sample collection and enumeration, experimental manipulation, data analysis, interpretation, and discussion. You cannot make up labs. Come dressed appropriately for each week's laboratory: labs happen rain or shine, warm or cold.

**SPECIAL NEEDS:**

I encourage students with disabilities, including invisible disabilities like chronic diseases, learning disabilities, and psychiatric disabilities, to discuss appropriate accommodations with me after class or during office hours. Please contact me by the end of the second week of classes (**26 Sept**) to ensure that accommodations can be made. You may also wish to talk with your teaching assistant if laboratory accommodations would be appropriate.

**RELIGIOUS HOLIDAYS:**

I realize that some students may wish to take part in religious observances that fall during Fall term. Should you have a religious observance that conflicts with your participation in the course, please come speak with me by the end of the second week of classes (**26 Sept**) to discuss appropriate accommodations.

**SEASONAL FLU:**

If you become ill and cannot make it to class, lab, an exam, etc., please email Dr. Irwin and Craig Layne and let us know that you are sick. All powerpoint files from lecture are on Blackboard (see below). For students who miss an exam due to illness, please alert me right away that you are sick, and I will find an alternative time for you to take the exam. If you must miss a lab due to illness, please alert Craig right away so we can determine how best to handle the missed lab.

**EXAMINATIONS AND GRADING:**

For the overall course grade, the lecture material will contribute 70% and the laboratory material will contribute 30%. The breakdown of the lecture and lab assessment items' contributions to grading is listed below. The Final Exam is cumulative.

<i>Lectures</i>	Exam I	20%
	Exam II	20%
	<u>Final Exam</u>	<u>30%</u>
	TOTAL	70%

<i>Laboratories</i>	Phenology Data Entry	4%
	Dichotomous Key	4%
	Stream Hypothesis & Prediction	4%
	Stream Invertebrate Paper	7%
	Pine Weevil Interpretation	4%
	<u>Phenology Interpretations</u>	<u>7%</u>
	TOTAL	30%

**CLASS CANVAS:**

We will make *extensive* use of the Canvas system for lecture and lab. Please regularly check Canvas for handouts, assignments, reading lists, required readings from the primary literature, and laboratory information. In particular, all lecture guides, reading assignments, and laboratory handouts will be posted on Canvas.

**HONOR PRINCIPLE:**

I take the Honor Principle very seriously. Violations have serious consequences. During exams, I suggest you use sharp pencils and an eraser. Bring your own pencil sharpener, if appropriate, and a non-programmable calculator (one that will not store formulas). This is all you may use. Everything you write must be entirely your own work. In lab, we want you to collaborate fully with fellow students while interpreting the data. But as soon as you begin writing a lab report, the writing *must* be entirely your own. The teaching assistants will remind you of the line where collaboration with other students ends. If you have any doubts, please ask.

**COURSE OBJECTIVES:**

1. **To explore the central theories and principles in ecology, and to survey the evidence that supports them. Major topics will include:**
  - *Limits to Distribution.* What determines where species do and do not occur?
  - *Population Ecology.* What determines the abundance, dispersion, age structure, and dynamics of biological populations?
  - *Species Interactions.* What is the nature of species interactions such as competition, predation, herbivory, and mutualism? How do these interactions influence the distributions and abundances of organisms?
  - *Community Ecology.* What determines the structure, organization, and dynamics of groups of species?
  - *Ecosystem Ecology.* How do materials and energy move through the biotic and abiotic components of ecosystems? How do organisms and abiotic factors influence the structure and function of ecosystems?
  - *Applied issues in ecology.* How do humans influence the workings of nature?
2. **To participate in the process by which theories are conceived, tested, refined, and falsified. In particular, learning goals from the Student's perspective are to:**
  - Understand not only how the discipline of ecology works, but also how science in general works.
  - Develop a broad overview of ecology, and in so doing develop an understanding of how species fit into the world around us.
  - Become proficient in reading graphs, interpreting data, evaluating and manipulating simple mathematical models, and applying empirical data to evaluate theoretical predictions.
  - Gain hands-on experience in what practicing scientists do in both lecture and laboratory by designing and conducting experiments, performing quantitative analyses, interpreting data, and reporting findings.

## LECTURE SCHEDULE

Day	Date	Topic	Reading
M	15 Sept.	Introduction	Chp 1, 4
W	17 Sept.	Limits to distribution I: Physical & chemical factors	Chp 2, 5, 7
Th	18 Sept.	<i>X-HOUR: no class, office hours</i>	
F	19 Sept.	Limits to distribution II: Species interactions	
M	22 Sept.	Limits to distribution III: Dispersal & colonization	Chp 9
W	24 Sept.	Limits to distribution IV: Habitat selection & the niche	Chp 8
Th	25 Sept.	<i>X-HOUR: no class, office hours</i>	
F	26 Sept.	Stream ecology introduction	Chp 3
M	29 Sept.	Population ecology I: Population regulation I	Chp 10, 11
W	1 Oct.	Population ecology II: Population regulation II	
Th	2 Oct.	<i>X-HOUR: no class, office hours</i>	
F	3 Oct.	Population ecology III: Life tables I	Chp 12
M	6 Oct.	Population ecology IV: Life tables II	
W	8 Oct.	Interspecific interactions I: Competition I	Chp 13
Th	9 Oct.	<i>X-HOUR: no class, office hours</i>	
F	10 Oct.	<b>EXAM I (material 15 Sept – 6 Oct)</b>	
M	13 Oct.	Interspecific interactions II: Competition II	
W	15 Oct.	Interspecific interactions III: Predation I	Chp 14
Th	16 Oct.	<i>*X-HOUR: Interspecific interactions IV: Predation II</i>	
F	17 Oct.	Interspecific interactions VI: Herbivory	
M	20 Oct.	Interspecific interactions V: Mutualism	Chp 15
W	22 Oct.	In-class movie: <i>Sexual encounters of the floral kind</i>	
Th	23 Oct.	<i>*X-HOUR: no class, no office hours</i>	
F	24 Oct.	Species interactions models: help with problem sets	
M	27 Oct.	Community ecology I: Biodiversity	Chp 16
W	29 Oct.	<b>EXAM II (material 8 Oct – 22 Oct)</b>	
Th	30 Oct.	<i>X-HOUR: no class, office hours</i>	
F	31 Oct.	Community ecology II: Disturbance & succession I	Chp 20
M	3 Nov.	Community ecology III: Disturbance & succession II	
W	5 Nov.	Community ecology IV: Island biogeography	Chp 22
Th	6 Nov.	<i>*X-HOUR: no class, no office hours</i>	
F	7 Nov.	<i>*No class</i>	
M	10 Nov.	Community ecology V: Food webs	Chp 17
W	12 Nov.	Ecosystem ecology I: Energy & productivity I	Chp 18
Th	13 Nov.	<i>*X-HOUR: Ecosystem ecology II: Energy &amp; productivity II</i>	
F	14 Nov.	Ecosystem ecology III: Nutrient cycling I	Chp 19, 23
M	17 Nov.	Ecosystem ecology IV: Nutrient cycling II	
T	25 Nov.	<b>FINAL EXAM -- 8 AM</b>	