

## General Ecology - Biology 110L Spring 2005

**Instructor** Dr. Chantal D. Reid  
Email: [chantal@duke.edu](mailto:chantal@duke.edu)  
Office: room 151, Biological Sciences Building  
Office hours: Thurs 3-5 and Fri 10-12, or by appointment

### Teaching Assistants:

Ryan Bartlett ([rpb2@duke.edu](mailto:rpb2@duke.edu))

Office hours: Monday 11:30 AM-12:30 PM, or by appointment, in room 059, BioSci

Sean Berthrong ([seanb@duke.edu](mailto:seanb@duke.edu))

Office hours: Tues. 9:00-10:00AM in room B225-B, LSRC

Michelle Hersh ([mhh4@duke.edu](mailto:mhh4@duke.edu)),

Office hours: Wed. 9:00-10:00AM in room 261, BioSci

Mike Osland ([mjo9@duke.edu](mailto:mjo9@duke.edu))

Office hours: Mon. 1:00-2:45 PM or by appointment in A223, LSRC

### Course synopsis:

In this course, students will be introduced to the science of ecology, which examines the relationships of organisms with their environment. Topics will range from physiological and behavioral ecology at the individual level, to population dynamics, community ecology, and nutrient and energy cycling at the ecosystem level. Current issues, such as, biotic invasions, overexploitation of resources, and global change will be addressed. Laboratory section will include local field trips.

### Text:

Molles Manuel C. Jr. 2005. *Ecology: Concepts and Applications*, 3<sup>rd</sup> Ed., McGraw Hill, 622 pp.

Other readings from primary literature will be posted on the Course blackboard website.

### Laboratories:

Laboratories are an integral part of this course and your attendance and participation are required. They represent nearly half your grade. The experiments and exercises complement the lecture material and cover related topics. You will learn techniques, gather data, think critically about them, and make you own interpretation based on your acquired knowledge on the topic. Make sure you come prepared, that is, you have read

the laboratory handout and organized your lab/field notebook (carbonless duplicate notebook) with a question and objective, and a list of materials needed. You will enter your data and your interpretation as you go and handout copies at the end of lab. For one third of the laboratories, you will write a short report (ca. 2-3 pages). Also, for a laboratory topic of your choice, you will have the opportunity to explore the literature to complete a research paper.

**Exams:**

Exams will cover material from lecture, text readings, and laboratory exercises. The final exam will be cumulative and comprehensive. Final grade will be based on a normal distribution curve, with the B/C cut-off set at 80% or the class median, whichever is lower.

There are no re-make for exams or laboratories, except for medical reasons or emergencies. For these, you will need a Dean's excuse. However, for short-term illnesses only, you need to fill the short-term illness notification form. Consult the short-term illness website for procedures (<http://www.aas.duke.edu/cgi-bin/trinity/t-reqs/illness/>). This does not excuse you from doing the work.

**Class participation:**

You are expected to attend all lectures. From time to time, we will do exercises or discussion in class.

**Point Structure:**

|                        |                  |
|------------------------|------------------|
| Weekly lab reports     | 150 points       |
| Major report project   | 50 points        |
| Midterm exams (2 x 75) | 150 points       |
| Final exam             | 120 points       |
| Class participation    | <u>30 points</u> |
| Total                  | 500 points       |

**Plagiarism:**

Remember that you have pledged to respect the *Duke Community Standard* (<http://www.integrity.duke.edu/ugrad/student.html>), that is, no lying, or cheating. Plagiarism and cheating will result in a 0 grade and will be reported to the judicial board. Consult the University Writing Program tutorial on the plagiarism (<http://www.ctlw.duke.edu/prgrms/uwpPlgrm.htm>).

**General Ecology - Biology 110L**  
Syllabus Spring 2005

| <i>Date</i>  | <i>Topic</i>                                 | <i>Primary Reading* (chapter)</i>           |
|--|--|---|
| Jan 12   | Ecology: how we do it? Then and now          | 1   |
| 17   | <i>Martin Luther King Day - No class</i>     |   |
| 19   | Set the stage: Major biomes                  | 2-3   |
| 24   | Biomes and climates that define them         | 2-3; 23, p. 561-564                         |
| <b>Individuals respond to their physical environment</b>             |  |   |
| 26   | Individuals and temperature                  | 4   |
| 31   | Individuals and water demand                 | 5   |
| Feb 2  | Individuals and energy use: aboveground      | 6, to p. 157                                |
| 7  | Individuals and energy use: belowground      | Begon <i>et al.</i> , Chap. 11 <sup>s</sup> |
| 9  | Mid-term I                                   |   |
| <b>Individuals act as populations</b>                                |  |   |
| 14   | What is a population ?                       | 9   |
| 16   | Population Dynamics                          | 10  |
| 21   | Population Growth                            | 11  |
| 23   | Life history strategies                      | 7, 12                                       |
| 28   | Evolution, adaptation, and genetics          | 8   |
| <b>Populations interact: within and between</b>                      |  |   |
| Mar 2  | Competition: within and between              | 13  |
| 7  | Predation                                    | 6, p. 158-161; 14, p. 356-368               |
| 9  | More interactions: parasitism <i>et al.</i>  | 14, p. 347-356; Begon, 12                   |
| 14-16  | <i>Spring Recess</i>                         |   |
| 21   | It's not all bad: positive interactions      | 15  |
| 23   | What are we doing to populations?            | *Chuenpagdee, Cook;                         |
| 28   | Mid-term II                                  |   |
| <b>Populations and species function as communities in ecosystems</b> |  |   |
| 30   | How is the community structured?             | 16  |
| Apr 4  | Food webs: another kind of structure         | 17  |
| 6  | Communities change through time              | 20  |
| 11   | Communities change in space                  | 22  |
| 13   | Communities in the landscape                 | 21  |
| 18   | Ecosystem function: energy cycling           | 18  |
| 20   | Ecosystem function: nutrient cycling         | 19  |
| 25   | How are human altering ecosystems?           | *Galloway                                   |
| 27   | What is the <i>global change</i> buzz about? | 23  |

\* Readings are from Molles Manuel C (2005) *Ecology. Concepts and Application*. 3<sup>rd</sup> Ed. McGraw Hill. 622 pp. Additional readings from primary literature will be provided as needed.

§ Chapters from the following reference will be available on Blackboard:  
Begon Michael, Harper John L., & Colin R. Townsend (1996) *Ecology : Individuals, populations and communities*, 3<sup>rd</sup> Ed. Blackwell Science, 1068 pp.

‡ Chuenpagdee R. et al. 2003. Shifting gears: assessing collateral impacts of fishing methods in US waters. *Front. Ecol Environ* 1(10) 517-524.  
Cooke SJ and Cowx IG. 2004 The role of recreational fishing in global fish crises, *Bioscience* 54 (9): 857-859.  
Galloway JN et al. 2003. The nitrogen cascade. *Bioscience* 53(4): 341-356.

**General Ecology - Biology 110L**  
**Laboratory schedule**  
 Spring 2005

| <i>Week of</i> | <i>Topic</i>                                  | <i>Report*</i> |
|----------------|---|----------------|
| Jan. 24        | Climate - Plant allocation I                  | Notebook only  |
| 31             | Plant Energy budget                           | Notebook only  |
| Feb. 7         | Population growth I                           | Notebook only  |
| 14             | Plant allocation in different environments-II | Lab report     |
| 21             | Demography                                    | Notebook only  |
| 28             | Population growth -II competition             | Lab report     |
| March 7        | Optimal Foraging                              | Notebook only  |
| 14             | <i>Spring Recess</i>                          |                |
| 21             | Symbiosis                                     | Notebook only  |
| 28             | Species diversity                             | Notebook only  |
| April 4        | Succession                                    | Lab report     |
| 11             | Landscape ecology                             | Notebook only  |
| 18             | Forest productivity                           | Lab report     |

\* Notebook refers to carbonless copies of your field/lab notebook. Lab report refers to a 2-3 pages report, which includes data from your fellow labmates as well, in addition to your filed/lab notebook.

To conserve resources, laboratory handouts will be posted on the Blackboard website for Biology 110L. They will be available Friday of the preceding week.