

# Population Ecology

Bio/ES 240



Fall, 2007

**INSTRUCTOR** Dr. Ann Throckmorton, Associate Professor of Biology

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Office hours: 11:00 – 12:30 Tuesday

10:30 – 11:30 Monday and Friday

*or by appointment*

**LECTURE** 12:50 - 1:50, M W F

152 Hoyt Science Center

Attendance in lecture is expected and 5% of your grade in the course will be based on attendance in lecture and lab. Because your success in this course is strongly dependent on your presence in class and your participation, you should make an effort to be present at all class sessions. Absence may be excused for personal emergencies or health-related problems. If you miss class, it is your responsibility to contact me and to obtain lecture notes and assignments that were given during your absence.

**LABORATORY** 2:00 - 5:00 Monday

319 Hoyt Science Center

Attendance in laboratory is required. You must notify me ahead of time if you know that you cannot be in lab. Because we will probably do a lot of lab exercises outside, in most cases, it won't be possible for you to make up a missed lab. Come prepared to go outside, no matter what the weather!

## REQUIRED

### MATERIAL

Textbooks: *Elements of Ecology*, by T. M. Smith and R. L. Smith (6<sup>th</sup> edition, 2006).

*A Handbook of Biological Investigation*, by H. W. Ambrose and K. P. Ambrose (5<sup>th</sup> or 6<sup>th</sup> edition).



There is no lab manual for this course. However, you will need a carbon-copy lab notebook. To a large extent, the weather will determine which labs we do this semester. If the weather is good, we will go outside. If not, there are lots of good lab exercises that we can do inside. Because of the uncertainty associated with predicting the weather ahead of time, I will post the lab exercises on the r-drive as soon as I can prior to the day of lab. You are responsible for printing out the exercises and bringing them to lab.

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## PURPOSE OF THIS COURSE

1. To explore the relationships between organisms and their environments, and to investigate the factors that determine the distributions and abundances of living things. To discover general ecological principles that shape the living world.
2. To explore the role of humans in planetary ecology and to discuss positive and negative impacts of human populations on other species, habitats, and ecosystems.
3. To demonstrate how ecologists use the scientific method and what its abilities and limitations are within the field.
4. To give insight into the quantitative nature of biological relationships and to introduce the mathematical methods used by ecologists to investigate these relationships.
5. To present some of the methods used by ecologists in the laboratory and in the field, and to show how these methods are used to develop, test, and investigate theories. This includes:
  - a) development of a familiarity with some important types of information used by ecologists;
  - b) basic principles of experimental design as they apply to ecological study
  - c) collection of data; and
  - d) development of conclusions based on data analysis.
6. To stimulate you to think critically and logically, by discussing important ecological concepts and theories, reviewing significant ecological studies, designing experiments, and collecting, analyzing, interpreting, and presenting data.

## METHODS OF INSTRUCTION

1. Lectures and discussion: This will follow the tentative schedule printed below. I expect you to attend class, pay attention, and participate actively in the discussion by answering questions, asking questions, and making appropriate comments. You will get more out of the lecture and discussion if you have read the material in the textbook ahead of time. Bring your textbook to class every day.
  2. Readings and assignments: The textbook that I have chosen provides a good introduction to the subject of population ecology. Most of the topics that we will approach in the class are covered by the book. Readings from the textbook will augment the lecture and provide material for discussion. Additional material to be read for the lecture or laboratory will be placed on reserve in the library. Small class assignments will enhance particular lecture topics and introduce several important tools for the acquisition and use of ecological information.
  3. Laboratories: This is a very important part of the course. In some cases the laboratory exercises will parallel what we are discussing in lecture, to increase your understanding of certain topics and to give you a different perspective on them. But, in many cases labs will be used to introduce topics that we will not discuss in lecture. These labs will give you experience using the methods and equipment of a field biologist. Keeping a lab notebook and producing lab write-ups will help you synthesize what you have learned and solidify the knowledge. Laboratory worksheets will emphasize problem solving and analytical thinking. Whenever we are starting a new lab exercise, I expect you to come to lab with the Introduction and a preliminary Methods section completed and ready to turn in.
  4. Attendance: Five percent of your grade will be based on attendance. You will lose 0.5% for each unexcused absence from lecture, 2% for each unexcused absence from lab.
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## GRADING

Grades will be based on exams, your laboratory notebook, laboratory write-ups, assignments, and attendance:

lecture exams (4)	= 50% of final grade
laboratory notebook	= 25% of final grade
laboratory write-ups	= 10% of final grade
assignments	= 10% of final grade
attendance	= 5% of final grade

Your final grade will be based on the following scale:

Above 93%: A	87% - 90%: B+	77% - 80%: C+	67% - 70%: D+	below 60%: F
90% - 93%: A-	83% - 87%: B	73% - 77%: C	63% - 67%: D	
	80% - 83%: B-	70% - 73%: C-	60% - 63%: D-	

## POLICY ON EXAMS AND ASSIGNMENTS

You must take the exams at the scheduled time unless you have talked to me prior to the exam and been excused. Valid excuses include such things as serious illness or injury and personal and family emergencies. I will give make-up exams *only* if you have notified me personally before the day of the test.

All assignments must be turned in by 5:00 p.m. on the day that they are due unless you are absent the day that the assignment was due and had a valid excuse. Points will be subtracted from assignments turned in late. Occasionally, assignments will be due in class but I will let you know ahead of time if this happens.

You may turn in assignments, labs books, and lab write-ups in three ways:

1. hard copy: the least desirable method, except for lab books. Hand the paper to me, slide it under my office door, or give it to someone to deliver to me. *Do not use campus mail.*
2. in the Assignments folder on the course r-drive: if you save a file to the r-drive, the name of the file must contain your name and some indication of what it contains (e.g., the name of the file could be "Smith, Assignment 5"). You must save the file to another drive, then save it to the r-drive. If you try to save directly to the r-drive, the network will only write a blank temporary file and you will lose all of your work. Once you have saved something to the Assignments folder you will be unable to retrieve it, open it, or delete it.
3. as an e-mail attachment. Again, the name of the file must contain your name and some indication of what it contains. You can find out if I have received your messages by looking in the Sent Items folder in your mailbox.

## ACADEMIC INTEGRITY

Academic integrity is central to the purpose and pursuit of any academic community. In this class, I expect you to adhere to the principles of academic integrity stated in the [Westminster College handbook](#) and to maintain the highest standards of academic honesty and integrity, in keeping with the philosophy and purposes of the College.

"Academic dishonesty is a profound violation of this expected code of behavior. It can take several forms, including, but not limited to, plagiarism, cheating, purposely altering the work of another (without that person's permission), misrepresentation of attendance in class or at a College event, misrepresentation of work, facts or experimental results, unauthorized use of or intentional intrusion into another's computer files and/or programs, intentional damage to a computer system, unauthorized use of library materials and privileges, or engaging in any activity which attempts to alter or harm another's academic standing."

## TENTATIVE SCHEDULE OF LECTURE TOPICS AND READINGS

DATE	TOPIC	READING
Aug. 29	Introduction to the course	
Aug. 31	What is ecology? The nature of ecology	Chapter 1, pp. 2-9
Sept. 3 - 7	Adaptation and evolution	Chapter 2
Sept. 10 - 14	Adaptation and evolution (continued) Plant adaptations	Chapter 2 Chapter 6
Sept. 17 - 21	Plant adaptations (continued)	Chapter 6
Sept. 24	<b>EXAM #1</b>	
Sept. 26 - 28	Animal adaptations	Chapter 7
Oct. 1 - 5	Animal adaptations (continued)	Chapter 7
Oct. 8 - 12	Life history patterns	Chapter 8
Oct. 15 - 17	Properties of populations	Chapter 9
Oct. 19	<b>EXAM #2</b>	
	<i>Mid-semester break</i>	
Oct. 24 - 26	Population growth	Chapter 10
Oct. 29 - Nov. 2	Population growth (continued)	Chapter 10
Nov. 5 - 9	Population growth (continued) Intraspecific population regulation	Chapter 10 Chapter 11
Nov. 12 - 16	Intraspecific population regulation Metapopulations	Chapter 11 Chapter 12
Nov. 19	Metapopulations (continued)	Chapter 12
Nov. 21 - 23	<i>Thanksgiving break</i>	
Nov. 26	Metapopulations (continued)	Chapter 12
Nov. 28	<b>EXAM #3</b>	
Nov. 30	Human impacts on populations	Chapter 27
Dec. 3 - 7	Human impacts on populations (continued)	Chapter 27
Dec. 10	Human impacts on populations (continued)	
Dec. 11	Reading day	
Dec. 12, 11:30 a.m.	<b>FINAL EXAM</b>	