

BIOLOGY 345: ECOLOGY & EVOLUTION

Fall 2012

T, Th 9:30 – 10:50 AM

001 Life Sciences Complex

INSTRUCTORS:

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TEACHING ASSISTANT:

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Office hours: T, Th 11:00-11:30 AM or by appointment

COURSE OBJECTIVES AND LEARNING OUTCOMES:

This course will introduce students to the ecological and evolutionary processes that operate on populations, with a special emphasis on the maintenance and origins of biological diversity and communities. Through case studies, we will cover several key topics such as natural and sexual selection, community assembly, food webs, speciation and species diversity, competition, and population and evolutionary genetics. We will also relate the topics we cover to the challenges faced by our society in the 21st century. By completing this course students will gain the skills necessary to implement and evaluate current theory and practices of ecology and evolution. Prerequisite: Biology 121/123.

COURSE POLICIES:

Textbooks & Reading. Two texts are required, available in the SU Bookstore:

1. *Evolution*, 2nd Edition (2009), Douglas Futuyma (Sinauer)
2. *The Economy of Nature*, 6th Edition (2008), Robert Ricklefs (Freeman)

Relevant chapters for each lecture are indicated on the course schedule below. Although the course content is not organized around the structure of the textbooks, lectures will include textbook examples and most students will find the texts to be essential resources for course topics. There will be two primary literature readings, one in ecology and one in evolution, to be assigned during the course of the semester.

Attendance - Students are **strongly** encouraged to attend all lectures. Lecture outlines will be posted on Blackboard; however, outlines are only supplements to our actual lectures and we will expand on the outlines. We will stop posting outlines if students stop attending lectures.

Academic integrity - By taking this course, all students agree to a high standard of academic honesty. Student work and performance on assignments and exams will represent *individual* effort. Cheating is defined as obtaining or giving unauthorized help on assignments, exams, and papers. Obtaining illegal copies of exam questions prior to the exam or tampering with a graded exam are also defined as cheating. Students caught cheating will be reported to the Academic Integrity office and will receive a failing grade for the assignment and possibly for the course, at the instructors' discretion. The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about

instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academicintegrity.syr.edu>.

Disability-Related Accommodations - Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498. Students with authorized disability-related accommodations should provide a current Accommodation Authorization Letter from ODS to the instructor and review those accommodations with the instructor. Accommodations, such as exam administration, are not provided retroactively; therefore, planning for accommodations as early as possible is necessary. For further information, see the ODS website, Office of Disability Services <http://disabilityservices.syr.edu>

Course Evaluation - Course evaluation will be based on four exams (50 points each) and four on-line assignments (10 points each). Exams will be administered at the beginning of the scheduled day (Sept 18, Oct 11, Nov 6, Dec 6) and take most of the class period. Grades for exams will be weighted according to student performance: your BEST exam will count for 40% of your total exam points, and your WORST exam will count for 10% of total exam points; the other two exams will count for 25% (unweighted). There will be no make up examinations with the following exceptions: 1) an agreement reached between the student and instructor prior to the examination, and 2) an unplanned event, such as a medical condition, traffic accident, etc., together with appropriate evidence of the event. The format of make-up exams will be at the instructor's discretion and most likely will be long essay format. Make-up exams must be taken within one week of the scheduled exam. There will be no make-ups for the on-line assignments.

Note: THERE IS NO FINAL (CUMULATIVE) EXAM.

Course schedule

DATE	TOPIC	Lecturer	Text chapter
August	28 Introduction/What is Evolutionary Biology?	Althoff	Futuyma, Ch. 1
	30 History/Thinking Evolutionarily	Althoff	Futuyma, Ch. 1
September	4 The Null Model/ Natural Selection	Althoff	Futuyma, Pp. 220-226; Pp. 303-321
	6 Quantitative Genetics & Evolution	Althoff	Futuyma, Ch. 13
	7 Homework Assignment 1 due by 5:00 pm		
	11 Studying Selection/ Sources of Variation	Althoff	Futuyma, Ch. 8
	13 Genetic Drift and Population Structure	Althoff	Futuyma, Ch. 10
	18 EXAM 1	Althoff	---
	20 Life History Evolution	Althoff	Futuyma, Ch. 19
	25 Sexual Selection	Althoff	Futuyma, Pp. 387-396
	27 Speciation	Althoff	Futuyma, Ch. 17 & 18
	28 Homework Assignment 2 due by 5:00 pm		
October	2 Phylogenetics / Evolutionary Patterns	Althoff	Futuyma, Ch. 2 & 3
	4 Evolution of species interactions	Althoff	Futuyma, Ch. 19
	9 Climate Change & Evolution	Althoff	---
	11 EXAM 2	Althoff	---
	16 A Changing Biosphere	Fridley	Ricklefs, Ch. 4 & 5; + Pp. 52-53
	18 Niches	Fridley	Ricklefs, Pp. 429-433
	23 Population growth	Fridley	Ricklefs, Ch. 11
	25 Competition	Fridley	Ricklefs, Ch. 16
	26 Homework Assignment 3 due by 5:00 pm		
	30 Predation	Fridley	Ricklefs, Ch. 15
November	1 Dispersal, migration	Fridley	Ricklefs, Pp. 201-204, 426-428, 447-450
	6 EXAM 3	Fridley	
	8 Community assembly and structure	Fridley	Ricklefs, Pp. 369-376
	13 Species diversity	Fridley	Ricklefs, Ch. 20
	15 Succession	Fridley	Ricklefs, Ch. 19
	17 Homework Assignment 4 due by 5:00 pm		
	20 NO CLASS (Fall Break)		
	22 NO CLASS (Fall Break)		
December	27 Ecosystems, food webs	Fridley	Ricklefs, Ch. 22 & 23, + Pp. 376-389
	29 Global change	Fridley	TBD
	4 Invasions	Fridley	Ricklefs, Pp. 559-561
	6 EXAM 4	Fridley	

Instructors reserve the right to make minor changes to the course schedule. Any changes will be announced in class.